48th IUPAC Council Meeting
Final Agenda Book

12-14 August 2015

Busan, Korea

7/17/2015

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INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

Advancing Chemistry Worldwide

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Acting Secretary General
Mr. Colin J. Humphris (UK)

Treasurer
Prof. John Corish (Ireland)

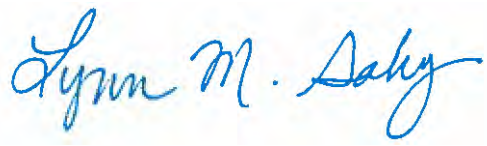
14 July 2015

All statutory actions necessary for convening the 48th IUPAC General Assembly and Council Meetings in Busan during the period 7-14 August 2015 have been taken through the following e-mail communications:

- Nominations of Candidates for Elections (Officers and Bureau)
- Official Invitations to National Adhering Organizations and Associate National Adhering Organizations
- Official Invitations to Associated Organizations
- Official Invitations to Members of IUPAC Bodies
- Draft Agenda and Request for Additional Agenda Items for Council Meeting Sent to NAOs
- Announcement of Candidates for Elections (Officers and Bureau)

The following informational items will be completed by 15 July 2015 and distributed to the NAO Delegations and other Council Meeting Attendees:

- Final Agenda and Detailed Agenda for Council Meeting Issued
- Agenda Book for Council Meeting



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* VOTING PROCEDURES IN IUPAC COUNCIL

(as of 14 July 2015)

There are 58 Delegations eligible to vote with a total of 165 assigned votes, not including the four provisional NAOs. They will only be eligible to vote if their applications for NAO status are approved by Council (see Agenda Item 10). The number of assigned votes may be changed on the day of the Council meeting depending on the number of NAOs in arrears at that time. A Table of assigned votes as of 14 July 2015 follows this.

1. Scientific Matters (Bylaw 2.11)

Voting by individual Delegates present at time of voting - simple majority on show of hands (84 if all assigned votes are cast).

2. Non-scientific Matters (Bylaw 2.2)

Voting by Delegation Cards - simple majority of votes cast is mandatory for all election matters, but see 2.4 below (84, if all assigned votes are cast).

(each Delegation must cast all of its votes in the same sense)

2.1 Admission and Removal of Members (Bylaw 2.21)

2.1.1 Admission - simple majority of Delegation Card votes cast (84, if all assigned votes are cast)

2.1.2 Removal - 75% of Delegation Card votes cast (124, if all assigned votes are cast)

2.2 Election of Officers (Bylaw 2.222)

Secret ballot by Delegation Voting Slips - simple majority of votes cast (84, if all assigned votes are cast)

(see second paragraph of Bylaw 2.222 for elimination procedure in case of lack of simple majority of votes)

2.3 Election of Bureau Members (Bylaw 2.222)

Secret ballot by Delegation Voting Slips - simple majority of votes cast per Bureau Member
(84, if all assigned votes are cast)

(see third paragraph of Bylaw 2.222 for elimination procedure in case of lack of simple majority of votes for necessary numbers of candidates)

2.4 Other Non-scientific Matters (Bylaw 2.23)

At the discretion of the Council, such matters may be adopted without a formal vote, for example, by a show of hands.

3. Change of Bylaw (Bylaw 6.2)

Voting by Delegation Cards – more than 50% of assigned votes (84)

4. Change of Statute (Statute 14.3)

Voting by Delegation Cards - 66.6% of assigned votes (109).

Note. Abstentions (Statute 5.32): In all Council voting procedures, abstentions shall not be recorded as votes.

Dr. Lynn Soby

Executive Director

Delegation Vote Assignments, IUPAC Council
12-13 August 2015, Busan Korea
***Subject to prior approval by Council.**

NAO	Votes
China/Beijing	6
Germany	6
Japan	6
Korea, Republic of	6
USA	6
France	5
Brazil	5
China/Taipei	5
India	5
Italy	5
Netherlands	5
Russia	5
UK	5
Spain*	5
Australia	4
Canada	4
Chile	4
Malaysia	4
Poland	4
Puerto Rico	4
Switzerland	4
Thailand	4
Turkey	4
Israel	3
Austria	3
Czech Republic	3
Finland	3
Ireland	3
Norway	3
Portugal	3
South Africa	3
Sweden	3

Updated with corrected numbers

NAO	Votes
Bulgaria	2
Denmark	2
Egypt	2
Greece	2
Hungary	2
New Zealand	2
Pakistan	2
Slovakia	2
Slovenia	2
Croatia	1
Cuba	1
Ethiopia	1
Jamaica	1
Kazakhstan*	1
Kuwait	1
Luxembourg	1
Mozambique	1
Nepal	1
Nigeria	1
Senegal	1
Serbia*	1
Sri Lanka	1
Uruguay	1

In Memoriam
(as of 17 July 2015)

IUPAC was saddened to learn of the following deaths of Union colleagues reported since the 47th General Assembly in Istanbul, Turkey 2013. We shall remember them with respect and gratitude for their service to IUPAC.
(Date of passing in parentheses, if known)

Prof. Robert A. Alberty (United States) – Division II Commission on Atomic Weights and Isotopic Abundances, Member, 1994-?
(18 January 2014)

Prof. Gerrit Den Boef (Netherlands) – IUPAC Secretary General, 1991-1995; Project Committee, Chair and Titular Member,1999-2001; IUPAC Fellow, 2002. Professor den Boef was 88. He retired from IUPAC activities more than ten years ago as the first chair of the Project Committee (1999-2001) and his last General Assembly was in Brisbane in July 2001. Long-time IUPAC members will remember him either as a Member or President of the Analytical Chemistry Division, or later as IUPAC Secretary General (1991-1995).
(8 July 2014)

Prof. Hans-Joachim Dietze (Germany) – Division II Commission on Atomic Weights and Isotopic Abundances, Associate Member, 1989-1997; Commission on Isotope Specific Measurements as Traceable References, Member; IUPAC Fellow1998
(27 February 2014)

Dr. Anthony R. H. Goodwin (United States) – Division I Commission on Thermodynamics, Associate Member, 1996-2001; IUPAC Fellow 2002; Commission on Thermodynamics, Member, 2002-2009; Division I, Associate Member, 2008-2011; Division I, Titular Member, 2012-2015; Commission on Physicochemical Symbols, Terminology, and Units, Titular Member, 2012-2015; (ICTNS) Interdivisional Committee on Terminology, Nomenclature, and Symbols; Division I Representative, 2012 to current; Project Chair 2012-051-1-100 and member of various projects of Division I.
(Dec 2014)

Dr. Robert F. Hampson (United States) – Division I Subcommittee on Gas Kinetic Data Evaluation for Atmospheric Chemistry, Secretary and Member 2000-2001; Fellow 2009; Member of Projects 1999-037-2-100, and 2007-001-2-100
(27 October 2013)

Prof. Derek Horton (United States)—Member, Division VIII taskgroup on Carbohydrate and Flavonoids nomenclature. Associate Member, IUBMB-IUPAC Joint Commission on Biochemical Nomenclature (JCBN) (1996(?)-2011). Prof. Horton, died at his home in Chevy Chase, MD. He was 82 years old.

He was Professor of Chemistry from 1959 to 1992 at The Ohio State University, where a wing in the CBEC building is named in his honor. Horton held the Isbell Chair of Carbohydrate and Natural Product Chemistry at American University from 1993 to 2009. Horton received numerous awards throughout his career including the Haworth Medal from the Royal Society of Chemistry, and the Patterson-Crane Award, the Wolfrom Award, and the Claude S. Hudson Award from the American Chemical Society. (5 June 2015)

Prof. Alan R. Katritzky (United States) – Division VIII Advisory Subcommittee, Member 2002-2013)
(10 February 2014)

Prof. John W. Lorimer (Canada) – Member since 1979; (ICTNS) Interdivisional Committee on Terminology, Nomenclature, and Symbols, Associate Member, 1996-1999, 2010-2011; Titular Member 2000-2009); IUPAC Bureau, Titular Member 1994-2003; Subcommittee on Solid Solubilities, Member 2000-2001; Project Committee, Titular Member, 1999-2003; Project Committee, Chair 2002-2003; (ICTNS) Interdivisional Committee on Terminology, Nomenclature, and Symbols 2004-2009; (PAC-EAB) Pure and Applied Chemistry Editorial Advisory Board, Ex-Offico 2006-2007); Division V Subcommittee on Solubility and Equilibrium Data, Member 2006-2015; Project Chair 2012-006-1-500
(1 February 2015)

Dr. Françoise Pontet (France) – Division VII Subcommittee on Nomenclature, Properties and Units in Laboratory Medicine, Chair and Member 2004-2005; Chair 2006*-2013); Division VII, Titular Member 2008-2009; Division VII Vice-President, 2010-2011); Division VII President 2012-; Bureau Member, 2012-; (PAC-EAB) Pure and Applied Chemistry Editorial Advisory Board 2012-; Member of various IUPAC Projects of Division VII
(April 2012)

Prof. Irene Schnöll-Bitai (Austria) – Division IV Subcommittee on Modeling of Polymerization Kinetics and Processes, Member 2004-2009; Member of Project 2003-023-2-400

Prof. François Schué (France) – Division IV Subcommittee on Macromolecular Terminology, Member 2008-2011; Member of Projects 2006-028-1-400 and 2004-043-1-400
(31 January 2014)

Dr. John Shorter (United Kingdom) – Division III Commission on Physical Organic Chemistry, Titular Member 1989-1997;
(23 March 2013)

48th IUPAC COUNCIL MEETING
Busan, Korea, 12-13 August 2015
AGENDA

1. Introductory Remarks and Finalization of Agenda

2. Approval of Minutes of 47th Council Meeting and Matters Arising

3. Ratification of Decisions Taken by Bureau and Executive Committee since 47th General Assembly, including the appointment of the current Acting Secretary General

4. Announcement of Nominations for Union Officers and Bureau Members

5. Announcement of Time of Elections

6. Presentation by Professor Nicole Moreau Executive Committee ICSU

7. Statutory Report of President on State of the Union

8. Vice President's Critical Assessment

9. Report of Acting Secretary General

10. Applications for National Adhering Organization (NAO) and Associate National Adhering Organization (ANAO) Status-Ratification
    - 10.1. Costa Rica (NAO) – National Nanotechnology Laboratory-High Technology National Center
    - 10.2. Colombia (NAO) - Sociedad Colombiana de Ciencias Químicas
    - 10.3. Kazakhstan (NAO) – Kazakh National Academy of Science
    - 10.4. Senegal (NAO) - Comité Sénégalais pour la Chimie
    - 10.5. Ghana (ANAO) - Ghana Institute For Pure And Applied Chemistry

11. Adoption of Recommendations on Nomenclature and Symbols

12. Report on validation and Naming of New Elements 113, 115, 117, 118

13. Reports of Division Presidents (Written reports will be received and 10 minutes allowed for questions and discussion on each)
    - 13.1. Division I – Physical and Biophysical Chemistry Division
    - 13.2. Division II – Inorganic Chemistry Division
    - 13.3. Division III – Organic and Biomolecular Chemistry Division
    - 13.4. Division IV – Polymer Division
    - 13.5. Division V – Analytical Chemistry Division
    - 13.6. Division VI – Chemistry and the Environment Division

13.7. Division VII – Chemistry and Human Health Division

13.8. Division VIII – Chemical Nomenclature and Structure Representation Division

END OF DAY ONE – COUNCIL RECEPTION

DAY TWO:

14. 09.00 Election of Union Officers and Bureau Members

15. Reports of Standing Committee Chairs (Written reports will be received and 10 minutes allowed for questions and discussion on each)

15.1. Committee on Publications and Cheminformatics Data Standards (CPCDS)

15.2. CHEMRAWN Committee

15.3. Committee on Chemistry and Industry (COCI)

15.4. Committee on Chemistry Education (CCE)

15.5. Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS)

15.6. Project Committee (PC)

15.7. Evaluation Committee (EvC)

16. Presentation of IUPAC service awards

17. WCLM Report

18. IUPAC 100 Proposals

19. Financial Reports

19.1. Biennial Report of Treasurer

19.2. Report of Finance Committee

19.3. Accounts for 2013-2014

19.4. National Adhering Organizations in Arrears

19.5. Appointment of Auditors for 2015 and 2016

COUNCIL LUNCH

20. Budget Proposal

20.1. Proposed Budget for 2016-2017

20.2. National Subscriptions for 2016-2017

21. Applications for Associated Organization Status

22. Termination of Associate Organization Status

    Federation of Asian Polymer Societies (FAPS) International Society of Heterocyclic Chemistry (ISHC) International Zeolite Association Int'l. Confederation fo Thermal Analysis & Calorimetry

23. Proposals Formally Received from National Adhering Organizations

24. Organizational Changes in Existing IUPAC Bodies, Proposals for New and Reconstituted Bodies/Terms of Reference

    24.1. Committee on Publications and Cheminformatics Data Standards (CPCDS)

        24.1.1. Approval of revised Terms of Reference

    24.2. Project Evaluation Committee (EvC)

        24.2.1. Approval of revised Terms of Reference

25. Plans for 49th General Assembly and 46th Congress in 2017 (Sao Paulo, Brazil)

26. Plans for 50th General Assembly and 47th Congress in 2019 (Paris, France)

27. Reauthorization of Commissions

28. Important Matters Referred to Council by Bureau at 48th General Assembly, Not Covered by Items on Council Agenda

29. Election of Union Officers and Bureau Members. Approval of Elected Officers of Divisions

30. Any Other Business

31. Closing Remarks, Adjournment

48th IUPAC COUNCIL MEETING
Busan, Korea, 12-13 August 2015
DETAILED AGENDA

Reference should be made to the Agenda Book for background information relating to the agenda items

Day One 12th August 2015

1. [13.00] Introductory Remarks and Finalization of Agenda

   [Dr Cesa]
   [For Information]

2. [13.10] Approval of Minutes of 47th Council Meeting and Matters Arising

   [Dr Cesa]
   [For Information and Decision; voting by show of hands]
   The Minutes are included in the Agenda Book for review.
   Motion: *Minutes of 47th Council Meeting in Istanbul, Turkey, are approved.*

3. [13.20] Ratification of Decisions Taken by Bureau and Executive Committee since 47th General Assembly, including the appointment of the current Acting Secretary General

   [Dr Cesa]
   [For Information and Decision; voting by show of hands]

   All decisions taken by the Bureau and Executive Committee through calendar year 2014, since those approved by the Council at Istanbul, Turkey (Minute 3, 47th Meeting), are contained in the following Minutes, which were distributed to National Adhering Organizations on the dates shown:

94th Bureau (Istanbul, Turkey, 15 August 2013)	23 May 2014
95th Bureau (Coimbra, Portugal, 12-13 April 2014)	11 June 2015
96th Bureau (Virtual Bureau, Meeting 27 May 2015)	13 July 2015
150th Executive Committee (Istanbul, Turkey, 15 August 2013)	23 May 2014
151st Executive Committee (Research Triangle Park, North Carolina 7-8 December 2013)	23 May 2014
152nd Executive Committee (Coimbra, Portugal, 13 April 2014)	20 March 2015
153rd Executive Committee (RTP, North Carolina, 8-9 November 2014)	20 March 2015

Motion: *Council ratifies all decisions taken by the Bureau and Executive Committee through calendar year 2014, since those approved by the Council at Istanbul, Turkey (Minute 3, 47th Meeting).*

4. [13.25] Announcement of Nominations for Union Officers and Bureau Members

[Mr Humphris]
[For Information]

Nominations Received: The nominees CV's, Photos and other information is included in the Agenda Book.

Vice President

Prof. Atta-ur-Rahman (Pakistan)
Prof. Qi-Feng Zhou (China, Beijing)

Treasurer

Mr. Colin Humphris (United Kingdom)

Secretary General

Prof. M. Iqbal Choudhary (Pakistan)
Prof. Richard Hartshorn (New Zealand)
Prof. Ron Weir (Canada)

Elected Members of Bureau

Prof. Christo Belarew (Bulgaria)
Prof. Christopher M. A. Brett (Portugal)
Prof. Mei Hung Chiu (China Taipei)
Prof. Hemda Garelick (UK)
Prof. Ehud Keinan (Israel)
Dr. Kew-Ho Lee (Korea)
Dr. Patrick Moyna (Uruguay)
Dr. Carlos Tollinche (Puerto Rico)
Prof. Pietro Tundo (Italy)

5. [13.35] Announcement of Time of Elections

[Mr. Humphris]
[For Information]

The elections for Vice President, Treasurer, Secretary General and Elected Members of the Bureau will be held at **09:00** hours on 13 August 2015.

Motion: *Council approves the appointments of Prof. Kaoru Yamanouchi (Japan), Prof. Jan Reedijk (Netherlands) and Dr. Fabienne Meyers (IUPAC Secretariat) as Election Tellers.*

6. [13.40] Presentation by Professor Nicole Moreau, Executive Committee ICSU

   [Prof. Moreau]
   [For information and Discussion]

7. [13.50] Report of the President

   [Dr. Cesa]
   [For Information and Discussion]

   7.1 Statutory Report on the State of the Union

   The President will report on the challenges and accomplishments of the Union in the current biennium. IUPAC has strengthened its infrastructure, its finances, and its place as a leader in the chemistry enterprise in the rapidly evolving field of science. Amid the continued strong scientific contributions of volunteers in the Divisions and Standing Committees, IUPAC has positioned its finances for future growth, stabilized and strengthened the Secretariat, and established a new collaborative model for its publications. As IUPAC now approaches its centenary in 2019, a strategy review has been completed to move the Union forward into its second century.

   7.2 IUPAC Strategy Review

   A task group of members of the Bureau, the ED, and the Associate Director, with the assistance of a professional facilitator, has completed a review of the IUPAC strategy. Input from a survey that reached a broad range of IUPAC volunteers, Members, stakeholders, and scientists outside the Union informed the development of a new vision statement, mission statement, core values, goals and objectives. The focus is on defining IUPAC's unique role in the chemical enterprise and to enable it to contribute effectively in the coming years. Constructive comments and support from members of the Bureau and the NAOs have helped refine the elements of the new strategy. The strategy is presented to the Council and to our volunteers in the Divisions and Standing Committees as they direct their efforts toward achieving our goals.

8. [14.20] Vice President's Critical Assessment

   [Prof. Tarasova]
   [For Information and Discussion]
   [CH1]The Vice President will report on the project system, gender and age distribution problems, UN Sustainable Development Goals and the role of the IUPAC in the fulfillment of these goals.

9. [14.40] Report of Acting Secretary General

[Mr. Humphris]
[For Information and Discussion]

The Acting Secretary General will report on the restructuring of the IUPAC Secretariat. This was in response to the exceptional circumstances it faced following the 47th General Assembly and to ensure that it is capable of supporting the work of the Union effectively into the future. The restructuring included:

- The implementation of the Agreements to transfer publishing of Pure and Applied Chemistry and Chemistry International to De Gruyter.
- The appointment of our new Executive Director Dr. Lynn Soby.
- Bringing in-house our core management accounting functions.
- Outsourcing the broad range of our required IT/web systems support, payroll and Human resources.
- Relocation of the Research Triangle Park office to modern accommodations more appropriate to the Union's future needs.

10. [15.00] Applications for National Adhering Organization (NAO) and Associate National Adhering Organization (ANAO) Status-Ratification

[Mr Humphris]
[For Decision; voting by show of hands]

The Spanish IUPAC Committee has applied for readmission under the terms of the readmission policy approved by the Executive Committee having ceased membership in 2015 under the terms of IUPAC Statute 9.2. A copy of the readmission policy and the application is included in the Agenda Book. The newly formed "Spanish IUPAC Committee" has fulfilled the requirements of the readmission policy.

Under the terms of the readmission policy they will be able to vote at Council, once Council approves their application. *[Spanish NAO – The organizations that form the Spanish IUPAC Committee and will represent Spain as the National Adhering Organization in IUPAC are Real Sociedad Española de Química (RSEQ) Federación Empresarial de la Industria Química Española (FEIQUE) Instituto de Tecnología Química (ITQ) Institut Català d'Investigació Química (ICIQ) and coordinated by Fundación Española para la Ciencia y la Tecnología (FECYT)]*

Motion 1: *Council approves the application of the Spanish IUPAC Committee (NAO) to be readmitted as an IUPAC National Adhering Organization. This approval is subject to the confirmation by the Executive Director that all outstanding invoices have been paid.*

Four organizations have applied for NAO status since the 47th Council Meeting. All four have been granted Provisional National Adhering Organization (NAO) status by the Executive Committee.

Two Provisional National Adhering Organizations have paid their 2014 National Subscriptions. Under the terms of Provisional Membership they will be able to vote at Council, once Council approves their applications. The two organizations are:

10.1. Kazakh National Academy of Science, Kazakhstan (NAO)

10.2. Comité Sénégalais pour la Chimie, Senegal (NAO)

Motion 2: *Council approves the applications of the Kazakh National Academy of Science and of the Comité Sénégalais pour la Chimie to become IUPAC National Adhering Organizations. This approval is subject to payment of the 2014 National Subscription fees by Kazakhstan and Senegal. The Executive Director has confirmed payment for both applicants.*

Two Provisional National Adhering Organizations have not paid their 2014 National Subscriptions. Under the terms of Provisional membership they can only become members as from January 1st 2016 if their 2014 and 2015 subscriptions are paid. If not, their provisional status ceases.

The two organizations are:

10.3. National Nanotechnology Laboratory - High Technology National Center, Costa Rica (NAO)

10.4. Sociedad Colombiana de Ciencias Químicas, Colombia (NAO)

Motion 3: *Council approves the applications of National Nanotechnology Laboratory - High Technology National Center, Costa Rica and Sociedad Colombiana de Ciencias Químicas subject to their payment of their 2014 and 2015 subscriptions prior to January 1st 2016.*

One organization has applied for ANAO status since the 47th Council Meeting. Provisional Associate National Adhering Organization (ANAO) status has been granted by the Executive Committee and the 2014 ANAO membership fee has been paid. Under the terms of Provisional Membership this organization will have full rights as an ANAO of IUPAC. The organization is:

10.5 Ghana (ANAO) - Ghana Institute For Pure And Applied Chemistry

Motion 4: *Council approves the application of the Ghana Institute For Pure And Applied Chemistry become an IUPAC Associate National Adhering Organization. This approval is subject to payment of the 2014 National Subscription fees by Ghana. The Executive Director has confirmed payment of Ghana's 2014 National Subscription.*

11. [15.10] Adoption of Recommendations on Nomenclature and Symbols

[Mr. Humphris]
[For Information and Decision; voting by show of hands]

Motion: *Council formally adopts the Recommendations approved by the Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS) and published, or scheduled to be published, in Pure and Applied Chemistry from August 2013 through July 2015.*

12. [15.15] Validation and Naming of New Elements 113, 115, 117, 118

[Prof Corish]
[For Information]

The IUPAC/IUPAP Joint Working Party charged with the task of examining claims for the discoveries of these four elements to establish whether they fulfil the necessary criteria and assigning priorities to the successful laboratories have produced two draft IUPAC Technical Reports that have been sent to Pure and Applied Chemistry for review and publication. The first of these reports is entitled 'Discovery of the elements with atomic numbers Z = 113, 115 and 117. The second is entitled 'Discovery of the element with atomic number Z = 118 completing the 7th row of the Periodic Table'. In accordance with usual practice the draft reports were sent to the relevant laboratories to be checked for technical accuracy. They are also currently undergoing expert review prior to acceptance for publication. As soon as these are published and then accepted by the Executive Committees of IUPAC and IUPAP Professor Jan Reedijk, President of the IUPAC Inorganic Chemistry Division (Division II), can begin the second phase of the process to name new elements by inviting the laboratories to which priorities have been assigned to propose names and symbols for those elements deemed to have been discovered. These proposed names and symbols are then considered by the Division II Committee before being sent for expert and public review as provisional recommendations. After the successful completion of all these reviews, approval of the recommendations of the new names and symbols is sought from Council.

As the second phase of the process is likely to begin shortly after the Council meeting at Busan the Council will be asked to delegate the authority to the Bureau to approve any provisionally recommended names and symbols that have completed the full examination process.

Any interim updates of this position will be communicated to the Council Meeting.

[15:25-15:50 Refreshment Break]

13. [15:50] Reports of Division Presidents (Written reports will be received and 10 minutes allowed for questions and discussion on each)

[Mr Humphris]
[For Information and Discussion]

13.1 [15.50] Division I – Physical and Biophysical Chemistry [Prof. Roberto Marquardt]

13.2 [16.00] Division II – Inorganic Chemistry Division [Prof. Jan Reedijk]

13.3 [16.10] Division III – Organic and Biomolecular Chemistry Division [Prof. Mary Garson]

13.4 [16.20] Division IV – Polymer Division [Prof. Greg Russell]

13.5 [16.30] Division V – Analytical Chemistry Division [Prof. D. Brynn Hibbert]

13.6 16.40] Division VI – Chemistry and the Environment Division [Dr. Laura McConnell]

13.7 [16.50] Division VII – Chemistry and Human Health Division [Dr. Thomas J. Perun]

13.8 [17.00] Division VIII – Chemical Nomenclature and Structure Representation Division [Dr. Karl-Heinz Hellwich]

[17.10] Closing Comments followed by the Council Reception

End of Day One

Day Two 13th August 2015

14 [09.00] Election of Union Officers and Bureau Members and Approval of Elected Officers of Divisions

[Dr Cesa]

[For Decision of Union Officers and Elected members of Bureau; voting by written and secret ballot (Bylaw B 2.22)]

An introduction to the election process for the 2015 Council Meeting is included in the Agenda Book. The election slate (nominees for Vice President, Secretary General and Treasurer and for Elected Members of the Bureau) and information about each of the candidates may also be found in the Agenda Book.

Motion 1: *Council ratifies the election of the new Vice President and Elected Members of the Bureau at the 48th General Assembly in Busan, Korea.*

In addition, Officers of the eight IUPAC Divisions are also listed for approval of the Council. Elections for Divisional offices have been completed prior to the Council Meeting, as is the normal procedure, and only require final ratification by the Council.

Motion 2: *Council ratifies the election of Division Officers and Titular Members that have been completed previously during individual divisional elections coordinated through the IUPAC Secretariat***.**

15 [09.50] Presentation of IUPAC service awards

[Dr Cesa]
[For celebration]

16 [10.00] Reports of Standing Committee Chairs (Written reports will be received and 10 minutes allowed for questions and discussion on each)

[Mr Humphris]
[For Information and Discussion]

16.1 [10.00] Committee on Publications and Cheminformatics Data Standards (CPCDS) [Ms. Bonnie Lawlor]

16.2 [10.10] CHEMRAWN Committee [Prof. Leiv Sydnes]

16.3 [10.20] Committee on Chemistry and Industry (COCI) [Prof. Bernard West]

16.4 [10.30] Committee on Chemistry Education (CCE) [Prof. Mei-Hung Chiu]

16.5 [10.40] Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS) [Prof. Ron Weir]

16.6 [10.50] Project Committee (PC) [Prof. Doug Templeton]

16.7 [11.00] Evaluation Committee (EvC) [Prof. Richard Hartshorn]

17 [11.10] Report from the World Chemistry Leadership Meeting (WCLM)

[Dr McConnell]
[For Information and Discussion]

The World Chemistry Leadership Team Meeting will be held on Wednesday 12th August 2015 starting at 09.00. The theme of the meeting is the UN sustainable development goals it will examine the contribution that the Chemistry community can make to realize them in a sustainable way.

18 [11.20] IUPAC 100 Proposals

[Prof Tarasova]
[For Information and discussion]

The task group considering the IUPAC Centenary in 2019 will have met on Saturday 8th August 2015.

19 [11:30] Financial Reports

19.1 Biennial Report of Treasurer

[Prof. Corish]
[For Information and Discussion]

The period since I last reported to you in Istanbul has been very unusual in the life of the Union but has also been particularly active in terms of our financial operations. Major changes have been carried out in the way in which we treat two of our income streams, namely our publications and investments, and the financial management of the Secretariat and of all our accounting and data systems has been completely modernized and improved to provide real time information and control of our expenditures and income. Our previous Executive Director resigned in September 2013, at the time of the last General Assembly, and was replaced by Dr. Lynn Soby in July 2014.

Up until 2013 our publishing operations had been showing a steady decline in annual income, due principally to the fall in the sales of Pure and Applied Chemistry, and was in very real danger of becoming a net cost to the Union rather than a valuable and essential source of income. In 2013 we entered into a partnership with De Gruyter to publish both PAC and Chemistry International; this has been described by the Acting Secretary General. The financial results of the first year of the operation of this new arrangement, 2014, are illustrated by the histogram of PAC net revenue less CI costs for the past five years in the Agenda Book which shows that the downward trend in income from publications has been successfully reversed. However, the change in our publication operation means that the income from the subscriptions to PAC received at the beginning of each calendar year is now paid to De Gruyter and this has greatly increased the pressure on our cash flow balance through each year.

At its meeting in February 2014, the Finance Committee decided that in the light of the changed financial climate we should restructure the way in which we managed our investments to a more pro-active stance to maximize our income return. After detailed consideration and discussions with prospective investment advisors the Finance Committee in a statement dated 31st October 2014 recommended to the Executive Committee that a change be made to the union's investor and bank relationships. This recommendation, which is reproduced in full in the Agenda Book, has been approved and implemented. The Investment Portfolio was transferred in November 2014 to BB&T and the Agenda Book contains the 2014 closing statements for our two investment accounts at the time at which the transfer took place. As is our standard practice, dividends received up to that time from mutual funds were reinvested, while interest received on bonds was used for operations. Since then our investment manager, Doug Bray, and the BB&T Investment Team review with the Finance Committee at the end of each quarter and provide monthly summary reports of all our investments to the Executive Director for distribution to the Finance Committee. The Agenda Book includes a diagram showing the combined value of the portfolio up to 2014.

19.2 Report of Finance Committee

[Prof. Corish]
[For Information and Discussion]

The Finance Committee meets once each year in February. At its 2014 meeting the Committee considered the operation of the financial systems at the Secretariat in the absence of an Executive Director – where necessary, for example to satisfy external audit requirements, the Treasurer had assumed responsibility. It carried out a systematic review of the portfolio and made a series of suggestions to assist in the control of expenditures. It considered that a more proactive and aggressive policy was required in the management of our portfolio to enable the Union to benefit from the current market conditions. There followed through the year a series of "Go To Meetings" with prospective financial management firms and this resulted in the recommendation to the Executive Committee mentioned in section 19.1 above and shown in full in the Agenda Book. The

recommendation was to consolidate our operating accounts with BB&T and the management of the investment portfolio to BB&T/Scott and Stringfellow.

At its meeting in 2015 the Finance Committee comprehensively reviewed the changeover that had been made in the management of our investment portfolio and approved its implementation and operation during its initial months. The Committee updated the IUPAC Investment Policy Statement to reflect these new arrangements. This updated policy is included in the Agenda Book. The Committee also examined in detail and approved the restructuring of the financial suite in the Secretariat with a view to building a fully integrated GAAP compliant system with a functioning multi-currency capability and consistent and fully updated data entries. It also reviewed a draft budget for 2016/2017 and advised of its preference for a balanced budget.

The minutes of the Finance Committee Meetings of 2014 and 2015 are in the Agenda Book.

19.3 Accounts for 2013-2014

[Prof. Corish]
[For Information and Discussion]

The Agenda Book contains the audited financial statements for 2013 and 2014 in which no areas of concern were noted by the auditors. Despite the unusual circumstances prevailing during much of this period as reported in the Biennial Reports of the Acting Secretary General and of the Treasurer the operations of the Union for the biennium were reasonably within budget.

19.4 National Adhering Organizations and Associate National Adhering Organizations in Arrears

[Prof. Corish]
[For Information and Discussion]

The Agenda Book contains a list showing those National Adhering Organizations that are in arrears in their subscription at this time.

19.5 Appointment of Auditors for 2015 and 2016

[Prof. Corish]
[For Decision; voting by show of hands]

It is recommended to Council that we appoint Batchelor, Tillery and Roberts, LLP, of Raleigh, North Carolina USA as IUPAC Auditors for 2015 and 2016.

Motion: *Council approves the appointment of Batchelor, Tillery and Roberts, LLP, of Raleigh, North Carolina USA as IUPAC Auditors for 2015 and 2016.*

LUNCH: 12:00-13:00

20 [13.00] Proposed Budget for 2016-2017 and National Subscriptions for 2016-2017

[Prof. Corish]
[For Discussion and Decision; voting by cards, >50 % of votes cast (Bylaw B2.2)]

20.1 Proposed Budget for 2016-2017

The Agenda Book contains the budget developed for 2016/2017 using the current model: this includes a line by line comparison with the budget for the current biennium. The projected expenditures were determined with the benefit of the information on real costs incurred during 2014 and utilizing the new and very much improved financial instruments implemented during the last year in the Secretariat. They are therefore more realistic than heretofore and the two per cent year-on-year increase in the total USD sum requested in the national subscriptions is seen to result in the model, in a small deficit in each of the two years: USD 24.8k and USD 23.5k in 2016 and 2017, respectively. However, as will be evident in the more careful considerations below, the outcome predicted by this model is rendered unfit for purpose by the changes in exchange rates that have occurred recently and, in particular, during the last year. An immediate difficulty is that if the exchange rates for the first quarter of 2015 are used rather than the average of the rates for the four quarters of 2014 (as is specified by the current model) then the USD incomes from NAO subscriptions is seen to fall short of those shown in the budget by approximately USD 75k in each year. Indeed use of these same average first quarter exchange rates for the budget that is in place for 2015 shows that the real income of the Union from subscriptions this year will be USD 844.8k rather than the USD 940.5k shown in the budget: the latter was based (again as specified in the current model) on the average 2012 exchange rates.

The Agenda Book also contains a second budget – marked ‘Proposed Interim Budget’ which the Officers, after careful consideration, wish to recommend to Council for adoption. This recommendation has the approval of the Bureau. The expenditure figures in this budget are identical with those in the current model budget, since these are believed to represent accurate and realistic estimates of the costs that will be incurred during the coming biennium. The basis upon which the income from NAO subscriptions has been determined and the rational used is described under Item 20.2 below.

20.2 National Subscriptions for 2016-2017

The amounts of the national subscriptions for 2016 and 2017 in the currencies in which they are paid and calculated using the current model are shown in the Agenda Book. This table, marked as ‘Current Model’, also shows the 2015 figures for comparison. The effects of the

changes in the CEFIC data used in the current model to determine the percentage allocation to each NAO and, more potently, the effects of changes in the exchange rates reveal a second serious difficulty with the current model. Large variations between the subscriptions calculated for 2015 and those calculated for the 2016 and 2017 are evident in the table shown in the Agenda Book and it is clear that a significant number of members would face substantial increases in their subscriptions if this model was adopted.

These changes in exchange rates have created a very difficult and in my experience a unique situation as we set a budget or the next biennium. In reality we must go from a real income of USD 844.5k in the current year (2015) to incomes of USD 956.4k and USD 975.5k in 2016 and 2017. This would require increases of 13.14% and 15.38%. The principal tenet of the second model – the proposed interim model - is that all NAOs share the load as equally as is possible and this is realized by requesting the same percentage increase from all our NAOs based on the currency in which they have chosen to pay. The model therefore maintains the same proportional allocations of the total sum as are being used in the current biennium and the proposal is for a 5% increase for each of the years 2016 and 2017 on the subscriptions paid in 2015. Using the average first quarter 2015 exchange rates, these proposed subscription rates will realize USD 887.1k and USD 931.4k in 2106 and 2017. These will represent overall deficits of USD 94.0k and US 67.5k in 2016 and 2017, respectively with respect to the expenditures shown in the current model budget. These deficits could, of course, further increased if exchange rates continue to follow current trends. However, an income for each of the years at these levels is proposed as a reasonable compromise under the very difficult circumstances and the deficits should be manageable within the overall size of our investment portfolio which, if necessary, can be utilized to fund operations. We will, of course, also seek to increase our income from other sources and to reduce expenditure wherever this is possible to seek to reduce the deficits predicted. A table showing the new proposed NAO subscription rates compared with those for 2015 is in the Agenda Book marked as ‘Proposed Subscriptions’.

It is intended that this proposed interim model will operate for the 2016/2017 biennium only. It use will overcome the difficulties evident in the application of the current model which has served us for some years now but which has clearly failed in the current financial circumstances. It will also provide an opportunity to reconsider the basis upon which our national subscriptions are calculated and the President proposes to set up a Task Force, which will begin work immediately to develop a new model for adoption at the General Assembly in 2017. The proposed composition of the Task Force which will complete its work by July 2016 is:

Executive Director	Dr. Lynn Soby (Chair)
Treasurer	Prof John Corish
Treasurer Elect	To be determined
Member of Finance Committee	To be appointed by the Finance Committee
Two Representatives of NAOs	Bureau Members, one from larger and one from smaller NAO.

Motion 1: *Council approves of the Proposed Interim Budget for 2016-2017 and the resulting National Subscriptions.*

Motion 2: *Council approves the establishment of a Task Force to determine a new method for calculating National subscriptions for approval at the 49th Council meeting in Sao Paulo, Brazil 2017.*

21 [14.00] Applications for Associated Organization Status

[Mr Humphris]

[For Information]

No applications for AO status have been received since the 47th Council Meeting.

22 [14.10] Termination of Associate Organization Status

[Mr Humphris]
[For Decision; by show of hands]

22.1 Federation of Asian Polymer Societies (FAPS)
22.2 International Society of Heterocyclic Chemistry (ISHC)
22.3 International Zeolite Association Int'l.
22.4 Confederation for Thermal Analysis & Calorimetry

The Federation of Asian Polymer Societies (FAPS), International Society of Heterocyclic Chemistry (ISHC), International Zeolite Association Int'l and Confederation for Thermal Analysis & Calorimetry International Plasma Chemistry Society and the Calorimetry are several years in arrears in the payment of their annual AO fees. They have not responded to contacts to try to rectify this situation.

Motion: *Council approves the termination of the Associated Organization status of the Federation of Asian Polymer Societies (FAPS), International Society of Heterocyclic Chemistry (ISHC), International Zeolite Association Int'l and Confederation for Thermal Analysis & Calorimetry International Plasma Chemistry Society and the Calorimetry for failure to pay annual subscription fees for several years.*

23 [14.15] Proposals Formally Received from National Adhering Organizations

[Mr Humphris]
No proposals have been received from National Adhering Organizations.

24 [14.25] Organizational Changes in Existing IUPAC Bodies, Proposals for New and Reconstituted Bodies/Terms of Reference

[Mr Humphris]
[For Information, Discussion and Decision; voting by show of hands]

24.1 Committee on Publications and Cheminformatics Data Standards (CPCDS)

Please see the Agenda Book for the changes proposed for the Terms of Reference of CPCDS by its Chair, Ms Bonnie Lawlor; these were recommended for approval at Council by the Executive Committee.

Motion 1: *Council approves the proposed Terms of Reference for the Committee on Publications and Cheminformatics Data Standards.*

24.2 Project Evaluation Committee (EvC)

Please see the Agenda Book for the changes proposed for the Terms of Reference of EvC by its Professor Richard Hartshorn; these were recommended for approval at Council by Bureau.

Motion 2: *Council approves the proposed Terms of Reference for the Project Evaluation Committee.*

25 [14.35] Plans for 49th General Assembly and 46th Congress in 2017 (Sao Paulo, Brazil)

[Mr Humphris]
[For Information and Discussion]

The Brazilian NAO will present a brief report on preliminary preparations for the next General Assembly and World Chemistry Congress to be held in Sao Paulo, in 2017.

26 [15.05] Plans for 50th General Assembly and 47th Congress in 2019 (Paris, France)

[Mr Humphris]
[For Information and Discussion]

The French NAO will present a brief report on preliminary preparations for the 50th General Assembly and 47th World Chemistry Congress to be held in Paris, in 2019.

27 [15.35] Reauthorization of Commissions

[Mr Humphris]
[For Decision; voting by show of hands]

Bylaw 3.302 requires that Council reapprove all existing Commissions at each General Assembly.

Motion: *Council reauthorizes the Commission on Physicochemical Symbols, Terminology and Units, the Commission on Isotopic Abundances and Atomic Weights, and the IUBMB-IUPAC Joint Commission on Biochemical Nomenclature (JCBN).*

28 [15.40] Important Matters Referred to Council by Bureau at 48th General Assembly, Not Covered by Items on Council Agenda

[Mr Humphris]
[For Information and Discussion]

The 97th Bureau meeting will have taken place on Tuesday 11th August 2015 in Busan. This item is to ensure all items for Council can be raised by Bureau.

29 [15.50] Any Other Business

[Dr Cesa]

30 [16.00] Closing Remarks & Adjournment

[Dr Cesa]

47th IUPAC COUNCIL MEETING
Istanbul, Turkey, 14-15 August 2013
Minutes

Contents

1. Introductory Remarks and Finalization of Agenda

IUPAC President Prof. Kazuyuki Tatsumi welcomed the delegates to the 47th IUPAC Council meeting. He thanked the Turkish Chemical Society for their hospitality and the excellent arrangements for both the General Assembly and the Congress.

Prof. Tatsumi asked for a moment of silence for IUPAC Colleagues deceased since Council last met in Puerto Rico.

Prof. Tatsumi introduced Prof. Orhan Altan who offered greetings from the International Council for Science (ICSU). Prof. Altan is from Turkey and is a member of ICSU Executive board ICSU. Prof. Altan reminded the audience of ICSU's role and vision and key priorities as outlined in the ICSU 2012-17 strategic plan, including area of international research collaboration, science for policy, and Universality of Science.

There were no additions or changes proposed to the Agenda. The Agenda was approved unanimously.

2. Approval of Minutes of 46th Council Meeting and Matters Arising

Prof. Tatsumi asked if there were any corrections or matters arising not covered elsewhere in the Agenda. No corrections or other matters were proposed. The motion below was made and seconded and was approved unanimously by a show of hands:

Motion: *Minutes of 46th Council Meeting in San Juan, Puerto Rico, are approved.*

3. Ratification of Decisions Taken by Bureau and Executive Committee since 46th General Assembly

All decisions taken by the Bureau and Executive Committee through calendar year 2012, since those approved by the Council at San Juan, Puerto Rico (Minute 3, 46th Meeting), are contained in the following Minutes, which were distributed to National Adhering Organizations on the dates shown:

91st Bureau (San Juan, Puerto Rico, 4 August 2011)	11 January 2012
92nd Bureau (Leiden, The Netherlands, 14-15 April 2012)	11 February 2013
145th Executive Committee (San Juan, Puerto Rico, 4 August 2011)	11 January 2012
146th Executive Committee (RTP, North Carolina, 15-16 October 2011)	11 January 2012
147th Executive Committee (Leiden, The Netherlands, 15 April 2012)	11 February 2013
148th Executive Committee (St. Petersburg, Russia, 20-21 October 2012)	11 February 2013

The motion below was moved and seconded and was approved unanimously by a show of hands (eligible delegates) as is appropriate for a non-scientific matter provided there is no controversy.

Motion: *Council ratifies all decisions taken by the Bureau and Executive Committee through calendar year 2012, since those approved by the Council at San Juan, Puerto Rico (Minute 3, 46th Meeting).*

4. Announcement of Nominations for Union Officers and Bureau Members

Secretary General Prof. René Deplanque noted that biographies of the nominees were available on the IUPAC website and in the Agenda Book for the Council meeting. He

informed the delegates that the voting order would be Vice President and then Elected Members of the Bureau. He indicated that depending on the result of the VP election, six or seven Bureau members would be elected to complete the full roster of ten members. The nominations received are given below.

Nominations Received:

Vice President

Prof. Natalia Tarasova (Russia)

Prof. Qi-Feng Zhou (China/Beijing)

Elected Members of the Bureau

Prof. Russell J. Boyd (Canada)

Prof. Tavarekere K. Chandrashekar (India)

Prof. Richard Hartshorn (New Zealand)

Mr. Colin Humphris (UK)

Prof. Christopher K. Ober (USA)

Prof. Pietro Tundo (Italy)

Prof. Jean-Pierre Vairon (France)

Prof. Kaoru Yamanouchi (Japan)

Prof. Qi-Feng Zhou (China/Beijing)

5. Announcement of Time of Elections

Prof. Deplanque announced that the elections for Vice President, and Elected Members of the Bureau would be held at 09:30 hours on 15 August 2013. He then announced that the proposed tellers for the elections were Prof. Doug Templeton, Prof. Jan Reedijk, and Dr. Fabienne Meyers.
The motion below was made and seconded and was approved unanimously by a show of hands:

Motion: *Council approves the appointments of Prof. Douglas Templeton (Canada), Prof. Jan Reedijk (Netherlands) and Dr. Fabienne Meyers (IUPAC Secretariat) as Election Tellers.*

6. Statutory Report of President on State of the Union

Prof. Tatsumi reported on what has changed since 2011. He reported that IUPAC included three new NAOs (Argentina, Mozambique, and Nepal), two new ANAOs (Venezuela and Indonesia) and urged everyone to engage their neighboring countries to become member of IUPAC. He summarized IYC 2011 with the following key numbers: 97 participating

countries; about 10000 individuals having registered in the IYC Network; and about 1400 activities enlisted on the IYC website while many more took place in reality. The cooperation with UNESCO has been successful and results today in a joint project with PhosAgro. Other forthcoming activities might include activities during the 2014 IYCrystallography.
Prof. Tatsumi highlighted that IUPAC has cooperation with the major chemistry Federations, including EUCheMS, FLAQ (Latin America), FASC (Asia), and FACS (Africa). Such network is a strong supplement to IUPAC 61 NAOs, 2 ANAOs, 33 AOs, 97 CAs, 1275 individual members, and 1400 Fellows. The Union also keeps an important network through its conference sponsorship program and which included 68 events in 2011, 31 in 2012, 32 in 2013, and that already has more than a dozen for 2014. There are many activities on-going in all Divisions and Committees and the following few are good examples that deserve publicity: the IUPAC periodic table of the Isotopes (Division II), the Young Ambassador Chemistry (YAC) and Flying Chemists Program (FCP) (Committee on Chemistry Education, CCE), the Safety Training Program (STP) (Committee on Chemistry and Industry, COCI), the Committee on Chemistry Research Funding (CCRF) that set to facilitate multinational research cooperation, and the more traditional activity associated to the recognition and naming of new elements (the most recent two being 114 and 116). But despite these examples, Prof. Tatsumi asked what should IUPAC do to increase the values of its activities, and which is key to the future of the Union. Prof. Tatsumi argued that the Union should be proactive in ensuring that the projects that the Union support do capture the latest developments in all emerging areas of chemistry. He also argued that IUPAC should better cooperate with NAOs.

7. Vice President's Critical Assessment

Dr. Mark Cesa delivered a summary of his Vice President's Critical Assessment. The detailed entire written report is available in the Council Agenda Book.

The VPCA provided a timely opportunity to assess IUPAC capabilities versus its goals and to seek areas of potential improvement. Issues of infrastructures (including finances, membership, communications) and scientific priorities were exposed.
Dr. Cesa argued that a strategic review is long due and it should focus on questions such as the following: How should IUPAC balance its emphasis on its traditional areas in chemistry with new and emerging science (e.g. climate science, sustainability, nanotech, sensors, computational chem/big data)? What make IUPAC unique and different from national or regional chemical societies? How can we share IUPAC's science knowledge with the greater science community and in particular with emerging regions?
The strategic review will begin with a survey and gathered input from in/out IUPAC; in/out chemistry. We will also seek input from the Young Observers.
A brief overview of Cesa's VPCA is available in the July-August 2013 issue of Chemistry International*; issue distributed to the Council delegates; also online at http://www.iupac.org/publications/ci/2013/3504/oc.html*

8. Report of Secretary General

Prof. Deplanque presented his first report as secretary general since he started in January 2012 and following the elections last held in San Juan. He reported that the Union faced

numerous challenges but that there are many people, including the officers who contributed to implement solutions. Prof. Deplanque refereed to the productive cooperation with UNESCO and the most recent 'Green Chemistry for Life' project emerging from a partnership with PhosAgro (*see VPCA, p. 62 in the Council agenda book and Treasurer report, p. 199*). Prof. Deplanque elaborated on the changes in publication policy that will affect both the IUPAC journal *PAC* and the newsmagazine *CI*. Recognizing that *PAC* income keeps going down and with no foreseeable income for web, he looked for a partner with the goal of leveraging to cost and workload. A contract with German/America De Gruyter has been recently signed and which should provide IUPAC with a professional support. Prof. Deplanque recognized the long time service of Professor James Bull who will as scientific editor of *PAC* retire by the end of the year. Professor Hugh D. Burrows (Universidade de Coimbra, Portugal) will succeed in that position. Prof. Deplanque invited the delegates to reach out to *CI* and call for input. He indicated that on the last 10 years, IUPAC published some 160 books, but yet, in a stock room in North Carolina, there is a stack of unsold volumes. This, he said, is not acceptable and we ought to find better basis for contracts with publishers to ensure that the ground work for negotiations with book publishers are sound and that Divisions and project leaders are not left alone in a process that can be challenging. Authors should be incentivized to publish work under IUPAC umbrella. Prof. Deplanque recognized that the IUPAC brand name is strong and that the Union must capitalize on this. One goal stressed by Prof. Deplanque is to establish one databank and ensure that IUPAC owns all the e-content copyright. He indicated that some old and current contracts do not specify what is to happen to e-content. It is likely that the Union will need legal advice to make sure that it preserves its rights. IUPAC produced standards and that is something to be proud of. Prof. Deplanque acknowledged the contribution of former executive director Terry Renner. He indicated that Renner's successor, John Petersen, had started a year ago but that he will be stepping down by the end September. Prof. Deplanque reported the web server was recently reset on a server in RTP. Previous servers had been consolidated by FIZ Chemie, but a move was required after a change of owner. This move includes hosting of the Inchi-trust website that is a consortium of publishers who support the implementation of Inchi that is a standard developed as the outcome of IUPAC Division VIII projects. Prof. Deplanque explained that Inchi provides a model of cooperation with outside organizations, and IUPAC future should explore extending its network and brand. One example to be considered is that idea of developing a seal of excellence: if someone uses an IUPAC standard, it could bear a IUPAC standard 'label'; journals might be interested in developing such label which will attest of their quality standard.

Prof. Paul De Bievre of Belgium welcomed the Secretary General in his new function. His main question was when the website will be at the disposable of the Divisions, and arguing that the website can use some improvement including a better search and a more appealing design.
The Secretary General replied that all was being worked out and that specific questions can be send to him directly or to Bryan Pearson in the Secretariat.

Dr. Karl-Heinz Hellwich of Germany thanked Bryan for his work and support, but he asked what back-up and support does the Secretariat have.

Prof. Deplanque confirmed that the office has the support and back-up of an outside contractor that provides support 24/7.

Prof. Luis Montero Cabrera of Cuba asked if the existing discussion platform can be better configured to suit the NAOs and favor communication between NAOs.

Prof. De Bievre of Belgium recognized that *Chemistry International* was a noteworthy newsmagazine for the Union and wanted to thank Fabienne Meyers for her contribution as managing editor.
The Secretary General followed by recognizing the contribution of Professor James Bull as scientific editor for IUPAC Journal *PAC*.

Prof. Tara P. Dasgupta of Jamaica mentioned that he has been associated to IUPAC for 30 years as affiliate; yet, generally, he observed that young scientists in the Caribbean region do not know about IUPAC; the same is true for ICSU. Dasgupta urged IUPAC to find mechanism(s) by which it makes itself better known; there is a need to connect, to better connect, and may be to establish chapter. Young people are 'hungry' but they have limited ways to get involved. While funding is limited, we must find a mechanism.
President Tatsumi replied that it was important to maintain connections and to make new ones; he emphasized CCE activities (YAC & FCP) as a mechanism to connect with local community.

Dr. Ting-Kueh Soon of Malaysia indicated that OPCW has more than 180 countries –more members than IUPAC; and therefore IUPAC must work harder to get more members. He suggested that IUPAC should help emerging countries to establish a chemical society which will allow them to also become part of IUPAC.
The Secretary General recognized the need to grow as an organization, but for that, the officers need more help.

Prof. Jamil Anwar of Pakistan echoed similar problems than those expressed by Malaysia and Jamaica: too few people know about IUPAC. He urged the officers to adopt better communications practices.

9. Applications for National Adhering Organization (NAO) and Associate National Adhering Organization (ANAO) Status

Prof. Deplanque reported that three organizations have applied for NAO status since the 46th Council Meeting. All three have been granted Provisional National Adhering Organization (NAO) status by the Executive Committee and have paid their 2012 National Subscriptions. Having paid all required National Subscription fees under the terms of Provisional Membership, Council approved their membership applications and all three organizations were eligible to vote during the Council meeting. The three organizations are:

9.1. Asociación Química Argentina (NAO)

9.2. Academy of Sciences of Mozambique (NAO)

9.3. Nepal Polymer Institute (NAO)

The following motion was approved by the required simple majority vote and with one vote against:

Motion: *Council approves the applications of the Asociación Química Argentina, of the Academy of Sciences of Mozambique, and of the Nepal Polymer Institute to become IUPAC National Adhering Organizations. This approval is subject to payment of the 2012 National Subscription fees by Argentina, Mozambique and Nepal.*

Dr. Rameshwar Adhikari of Nepal thanked the Council for their support.

9.4. Thailand has requested that its NAO to IUPAC be changed from the Chemical Society of Thailand to the Department of Science Service, Ministry of Science and Technology.

The representative from Hungary asked if that change was associated to any restriction imposed by that government agency over the priorities set by the Chemical Society.
The representative from Thailand confirmed that it was only for economic reasons and they asked IUPAC to keep both contacts in place for regular communication with the Union.

The following motion was approved, with one vote against and 4 abstentions:

Motion: *Council approves the request from Thailand to change its NAO Representative to IUPAC from the Chemical Society of Thailand to the Department of Science Service, Ministry of Science and Technology.*

10. Adoption of Recommendations on Nomenclature and Symbols

Prof. Deplanque referred the Delegates to the list of published Recommendations and Technical Reports compiled in the Agenda Book. The motion below was approved unanimously:

Motion*: Council formally adopts the Recommendations approved by the Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS) and published, or scheduled to be published, in Pure and Applied Chemistry from August 2011 through July 2013.*

10.1. Validation and Naming of New Elements

Prof. John Corish summarized the most recent efforts regarding the validation and naming of new elements with atomic numbers 114 and 116. Documentation was provided in the Council Agenda Book. IUPAC has officially approved the name flerovium, with symbol Fl, for the element of atomic number 114 and the name livermorium, with symbol Lv, for the element of atomic number 116. Priority for the discovery of these elements was assigned, in accordance with the agreed criteria, to the collaboration between the Joint Institute for Nuclear Research (Dubna, Russia) and the Lawrence Livermore National Laboratory (Livermore, California, USA). The collaborating team has proposed the names flerovium and livermorium that have now been formally approved by IUPAC.

Review of claims by the joint IUPAC-IUPAP working Party examining element 113, 115, 117, and 118 is on-going.

11. Reports of Division Presidents

The reports of the Division Presidents were accepted as read. Full reports are available in the Council Agenda Book.

11.1. Division I – Physical and Biophysical Chemistry Division [Prof. Yamanouchi]

11.2. Division II – Inorganic Chemistry Division [Dr. Loss]

11.3. Division III – Organic and Biomolecular Chemistry Division [Prof. Ganesh]

11.4. Division IV – Polymer Division [Prof. Russell, in for Prof. Buback]

11.5. Division V – Analytical Chemistry Division [Prof. Camões]

11.6. Division VI – Chemistry and the Environment Division [Dr. McConnell]

11.7. Division VII – Chemistry and Human Health Division [Prof. Templeton]

11.8. Division VIII – Chemical Nomenclature and Structure Representation Division [Prof. Hartshorn]

12. Reports of Standing Committee Chairs

The reports of the Standing Committee Chairs were accepted as read. Full reports are available in the Council Agenda Book.

12.1. Committee on Printed and Electronic Publications [Dr. Martinsen]

12.2. CHEMRAWN Committee [Prof. Sydnes]

12.3. Committee on Chemistry and Industry [Dr. Dröscher]

12.4. Committee on Chemistry Education [Prof. Chiu]

12.5. Interdivisional Committee on Terminology, Nomenclature and Symbols [Prof. Weir] Written report only

12.6. Project Committee [Prof. Powell] Written report only

12.7. Evaluation Committee [Prof. Penczek]

Dr. Rameshwar Adhikari of Nepal thanked Professor Leiv Sydnes and the CHEMRAWN Committee for including Nepal in their group, and also CCE for the Flying Chemists initiative and the Polymer Division for the active participation and support.

Prof. Tatsumi thanked the Divisions Presidents and Standing Committees Chairs to maintain and guide high level of activities.

13. Financial Reports

13.1. Biennial Report of Treasurer

Prof. Corish noted in his report that two of IUPAC's three principal income streams, sales from publishing and income from investments, have declined continuously during the past biennium, in line with worldwide experience in these areas. The first of these is being addressed commencing in 2014 through collaboration with a new publication partner, although it will take some more time for the full benefits of this partnership to emerge. A more flexible investment policy is being developed to attempt to maximize our investment income from a changing market.

Prof. Corish thanked the NAOs for their ongoing support, noting that the national subscriptions constitute the 3rd largest income for IUPAC.

Prof. Corish reported on the financial outcome from the International Year of Chemistry and recognized that overall only a fraction of the USD 500k allocated to the year celebrations were necessary and spent. The partnership with UNESCO was considered mutually successful and one noticeable result is a new joint project, the "PhosAgro/UNESCO/IUPAC Partnership in Green Chemistry for Life" which will tap into IUPAC scientific expertise over the next 5 years.

Prof. Corish also noted that over the last two years there have been a number of unforeseen but inescapable costs related to the appointment of a new Executive Director.

Prof. Corish announced that, starting in January 2014, receipts will be required for all claims made by members for reimbursements of expenses although the rates of allowances will not be changed. This documentation is required for better financial auditing practices.

13.2. Report of Finance Committee

Prof. Corish noted in his report that the two meetings of the Finance Committee held since the last General Assembly in Puerto Rico have, in addition to normal business, been concerned with careful reviews of the Union's investment portfolios. These reviews resulted in some adjustments in the investments being made in 2012.

In the current markets the yields from the types of high-quality bonds in which IUPAC normally invests have been reduced to one half or even less of the yields that the Union received from bonds that have recently matured. Reviews of the Investment Policy and Fund Policy Statements are underway to seek to optimize income from currently available investment opportunities.

13.3. Accounts for 2011 and 2012

Prof. Corish noted that the Agenda Book contained the audited financial statements for 2011 and 2012 and that no areas of concern were noted by the auditors. The operations of the

Union for the biennium were reasonably within budget. However, from a practical point of view, decreases in value of the yields from the investment portfolios and in the income from the sales of publications continue to serve stark warnings that the Union must diversify if it is to continue its current level of activities.

13.4. Appointment of Auditors for 2013 and 2014

Prof. Corish reported that the Bureau had recommended to Council the appointment of Batchelor, Tillery and Roberts, LLP, of Raleigh, North Carolina USA as IUPAC Auditors for 2013 and 2014. The motion below was unanimously approved by Council:

Motion: *Council approves the appointment of Batchelor, Tillery and Roberts, LLP, of Raleigh, North Carolina USA as IUPAC Auditors for 2013 and 2014.*

14. Budget Proposal

14.1. Proposed Budget for 2014-2015

Prof. Corish reported that framing the draft budget for 2014-2015 had not been an easy task and a very large number of options had been considered. It was important first to state that these considerations showed immediately that continuing to operate in the *status quo* would produce a large deficit and was clearly not a tenable way to proceed. As an example, the publication operations would have almost certainly gone into deficit within another year or so, largely due to steadily declining subscriptions for *Pure and Applied Chemistry*, along with continuously rising costs to produce and distribute this journal. The signing of an agreement with a partner for future publishing has resulted in the largest changes evident in the budget finally proposed for the next biennium when compared with budgets from earlier biennia. All of the production and printing costs of *Pure and Applied Chemistry* and *Chemistry International* will be taken over by the new publisher and the estimated publication income shown, USD 130 000, may eventually be increased or reduced somewhat depending on sales and on the production costs incurred by the publisher. This income, which is expected to increase in future years, is significantly less than the typical surpluses from our publications of former years when the operation generated a considerable profit. This reduction together with the reduction in investment income are the reason for the cuts – some very difficult – which have had to be made in our proposed expenditures for 2014-2015.

For instance, Prof. Corish noted that in the proposed budget, the surplus funds from completed, terminated, underspent, and abandoned projects are included in the budget instead of being transferred to the Strategic Opportunity funds as it was in previous years.

The IUPAC Prize for Young Chemists will see a reduced budget and the format of the prize itself might change while one consideration might be to not support travel for the winners to the Congress. Prof. Corish announced that Solvay has offered to sponsor the prize and negotiations are on-going to define the terms of such sponsorship.

14.2. National Subscriptions for 2014-2015

The Agenda Book includes a table showing the calculated 2014-2015 National Subscriptions. At the 2010 meeting of the Finance Committee it was agreed that an average of four quarters of currency exchange rate data be used for the calculation of National Subscriptions in national currencies. The effect of this longer-term average will be to even out anomalously high or low exchange rates during periods of rapid market fluctuation. National Subscriptions for 2012 and 2013 were calculated using this new procedure for determining time-averaged currency exchange rates. This same procedure has been used to calculate the National Subscriptions for 2014 and 2015.

It is worth noting that the calculation of these subscriptions follows an agreed algorithm that has complex dependencies on changes in the values of national production of chemicals relative to total worldwide production and fluctuations in currency exchange rates. The only variable that is under control of Council is the total National Subscription revenue that is obtained annually from the current 61 National Adhering Organizations (NAOs) of IUPAC. Experience shows that the individual National Subscriptions are influenced much more by changes in chemical turnover and exchange rates than by the size of the total National Subscription itself. For the next biennium it is proposed to increase the total National Subscription by 3% in each year.

Prof. Reedijk (The Netherlands) asked how, in the proposed budget, the AMP contributes to zero income. Prof. Corish noted that this was just a safe way to tabulate this input. It will depend of the actual price of *Chemistry International* that is yet to be finalized and which is negotiated with De Gruyter.

Prof. Garson (Australia) noted that the prospect having project funds returned to central budget might actually trigger more spending.

Prof. Dasgupta (Jamaica) suggested that *Chemistry International* could, like *PAC*, have an e-only subscription option.

Dr. Koch (Germany) asked about the terms of the contract with De Gruyter and how long does it stand and what cancellation options are there. Prof. Deplanque answered that the contract was for 5 years with an early escape option after 3 years. Dr. Koch suggested that IUPAC err on the side of caution and develop a ‘Plan B’ in case this new partnership was to fail.

The Secretary General indicated that under this new partnership with De Gruyter, IUPAC will benefit of the marketing support which it did not have while being self-publisher.

Prof. Horvai (Hungary) asked if the benefit of receiving *PAC* for free will be discontinued. Prof. Deplanque confirmed that the current access for NAOs will remain. Also *PAC* might be included and bundled with other journals in different subscription options offered by the publisher.

Prof. Qi-Feng Zhou (China) noted that the proposed National Subscription will translate in an increase of about 20% for China. This is a very difficult situation for the NAO which currently faces restrictions and an overall cut by 5%. Prof. Corish acknowledged that the

timing of the market fluctuations might in some cases be disadvantageous for some NAOs. Specific cases such as China could be reexamined.

Prof. Garelick (UK) asked what other models were considered to keep *PAC* sustainable and if *PAC* will be open access? The Secretary General commented that open access for *PAC* will not be that expensive.

Council was asked to approve the proposed budget, and the National Subscriptions that arise from its implementation, for the 2014-2015 biennium. The motion below was voted on by cards with 144 votes in favor, no against, and 5 abstentions:

Motion: *Council approves the proposed Budget for 2014-2015 and the National Subscriptions implied by the proposed Budget.*

15. National Adhering Organizations in Arrears

Prof. Deplanque reported that as of 13 August 2013 only one National Adhering Organization –that of Greece- was in arrears for the 2012 National Subscription payment. The Secretariat is working with this NAO to resolve the problem as soon as possible.

16. Applications for Associated Organization Status

Prof. Deplanque reported that there were no applications for Associate Organization (AO) status received since the 46th Council Meeting.

17. Termination of Associated Organization Status

Prof. Deplanque reported that the International Plasma Chemistry Society and the Calorimetry Conference were both several years in arrears in the payment of their annual AO fees. Neither has responded to contacts to try to rectify this situation. Council voted on the motion below. Voting was by show of hands with all voting in favor:

Motion: *Council approves the termination of the Associated Organization status of both the International Plasma Chemistry Society and the Calorimetry Conference for failure to pay annual subscription fees for several years.*

18. Proposals Formally Received from National Adhering Organizations

Prof. Deplanque reported that no proposals had been received from NAOs.

19. Organizational Changes in Existing IUPAC Bodies, Proposals for New and Reconstituted Bodies/Terms of Reference

Prof. Deplanque reported that the Committee on Printed and Electronic Publications (CPEP) proposed to change its focus and referred the Council to the Agenda Book for details.

The first motion to change the CPEP name was moved.

Prof. Garcia Martinez (Spain) asked what the rationale for the change of the name was. Dr. Martinsen (CPEP chair) explained that with the increase importance of e-science, increase of data, while simultaneously IUPAC journal will move to publishing partner, CPEP has a chance to shift its activities and also focus on databases and data.

The following motion was approved with 1 vote against and no abstentions:

Motion 1: *Council approves that the name of this Committee be changed from the Committee on Printed and Electronic Publications to the Committee on Publications and Cheminformatics Data Standards (CPCDS).*

Prof. Deplanque introduced the second motion related to the renamed committee and indicated that a way to ensure better communication of this CPCDS with other Divisions and Standing Committees is to consider the role and position of the chair.

The following motion was unanimously approved:

Motion 2: *Council approves that the Chair of the newly renamed Committee on Publications and Cheminformatics Data Standards be appointed to the Bureau.*

19.1. Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS)

Prof. Deplanque introduced a similar motion for ICTNS chair to be appointed to the Bureau, and that to facilitate communication with other Divisions and committees.

See the Agenda Book for details of the change proposed for ICTNS by its Chair, Prof. Ron Weir. The following motion was unanimously approved:

Motion: *Council approves that the Chair of the Interdivisional Committee on Terminology, Nomenclature and Symbols be appointed to the Bureau.*

20. Plans for 48th General Assembly and 45th Congress in 2015 (Busan, Korea)

The Korean NAO presented a brief report on preliminary preparations for the next General Assembly and World Chemistry Congress to be held in Busan, Korea, on 9-14 August 2015. Please see the Agenda Book for additional details. *(see also www.iupac2015.org)*

21. Approval of Site and Dates for 49th General Assembly and 46th Congress in 2017

Prof. Deplanque reported that proposals had been received from Australia and Brazil to host the General Assembly and Congress in 2017. Both proposals had been evaluated by the Bureau during its 92nd Annual Meeting held in Leiden, The Netherlands, in April of 2012. Both Australia and Brazil submitted proposals that were deemed by the Bureau to be in compliance with the formal call and both were approved for presentation at this Council Meeting in Istanbul.
Additional supporting details were provided in the Agenda Book.

After presentation by each delegations, the Council was asked to vote either for Australia or for Brazil as the host for the biennial IUPAC events in 2017.

Prof. Deplanque reported that the results of the ballots were as follows:

Melbourne, Australia:	31
Sao Paulo, Brazil:	119

The following motion was passed:

Motion: *Council approves the proposal from Brazil to host NAO for the 49th General Assembly and 46th Congress to be held in 2017.*

22. Approval of Site and Dates for 50th General Assembly and 47th Congress in 2019

Prof. Deplanque introduced the proposal made by the French NAO.
Proposals to host the 50th General Assembly and 47th Congress in 2019 were also received and evaluated by the Bureau during its 92nd Annual Meeting held in Leiden, The Netherlands, in April of 2012. Both China/Beijing and France submitted proposals that were deemed by the Bureau to be in compliance with the formal call and both were approved for presentation at this Council Meeting in Istanbul. Since that time, the Chinese Chemical Society has withdrawn its proposal in consideration of the fact that the IUPAC events in 2019 will celebrate the 100th anniversary of the birth of IUPAC in France. The historical significance of this founding event in France provided the basis for China/Beijing's thoughtful and generous decision to withdraw its proposal. At the same time, China/Beijing has also expressed interest to host the 2021 IUPAC General Assembly and World chemistry Congress.
The Agenda Book includes the letter that officially announces the intention to withdraw the proposal by the Chinese NAO.
The Agenda Book includes the detailed proposal from France as previously approved by the Bureau.

By vote of Council, France was chosen as the host for the historic events in 2019.
Prof. Deplanque reported that the result of the ballots was as follows:

For:	151
Against:	4

Motion: *Council approves the proposal from France to host NAO for the 50th General Assembly and 47th Congress to be held in 2019.*

23. Report from the World Chemistry Leadership Meeting (WCLM)

Dr. Michael Dröscher (COCI chair) reported on the activities of the World Chemistry Leadership Meeting (WCLM) that took place during the General Assembly on 13 August 2013.

This year WCLW was set in the context of the recent International Year of Chemistry 2011 and Rio +20, and with a focus on IUPAC's role to the future of chemistry. The objective was to engage young chemists in a debate and ask their opinions on the strategic challenges that IUPAC is facing. Several NAOs, including France, Germany, Japan, Russia, UK, and US contributed and helped finance the trips of young chemists; a group of more than 40 young observers/participants (YOs) was convened. Dr. Dröscher reported that the YOs coined IUPAC as the "United Nations of Chemists". The idea of the WCLM was to let the YOs discuss and develop answers to the following four issues: 1) the future of chemistry in the context of the Millennium Development Goals; 2) the scope of pure and applied research; 3) IUPAC's role today and in future; and 4) career aspirations.
The group met in the morning of August 13th in three breakout groups, each with about 15 participants. Each group prepared key messages from their findings and each had a rapporteur who presented these key messages in the afternoon plenum session. That session was opened by Past President Nicole Moreau, and on the stage, a panel included Professor Barry Halliwell, Professor Niyazu Sariciftci, and Vice President Mark Cesa. More than 120 attendees were present in the afternoon session.
Practical suggestions reported by YOs and that could further benefit their experience as YOs include: IUPAC should develop a post–YOs program to nurture more interest and bind young people within IUPAC; the support of IUPAC members as mentors is valuable; YOs should participate in current task groups to get further engaged in IUPAC activities; more technology-based projects shall be initiated; as a way to increase diversity; other languages than English shall be utilized; other successful NGOs are very good at engaging their volunteers, and their model and practice could be applied by IUPAC.
The ideas emerging from the debate –including YOs reflection on the main global challenges– will be passed onto the vice president and as an input for the Union strategic review. As an outcome of this meeting, a commentary style article will be prepared.
(An article has been published in Chem Int, Jan-Feb 2014, p. 24: http://dx.doi.org/10.1515/ci.2014.36.1.24)

Then, one young observer/participant from the UK took the stage. She commented that to be truly representative, the number of YOs should really increase and from more countries; she urged all the NAOs to extend their support to more young chemists. She recognized that IUPAC members encouraged the YOs to be more than observers, and some YOs already have ideas to develop new projects and will join existing projects. Striking to most of the YOs is the scientific breath and cultural diversity that IUPAC embodies.

24. Reauthorization of Commissions

Prof. Deplanque noted that Bylaw 3.302 requires that Council reapprove all existing Commissions. Council then voted on the motion below. The motion was unanimously approved by a show of hands:

Motion: *Council reauthorizes the Commission on Physicochemical Symbols, Terminology and Units, the Commission on Isotopic Abundances and Atomic Weights, and the IUBMB-IUPAC Joint Commission on Biochemical Nomenclature (JCBN).*

25. Approval of English as the Official Language of IUPAC

Prof. Deplanque noted that Statute 5.405 requires that Council "determine every four years the one language in which the official records of the meetings of the Council, Bureau, and Executive Committee shall be kept and published." The last time that such a determination was made was at the General Assembly held in Glasgow, Scotland, in the year 2009, four years ago.
The Bureau proposes that the official language of IUPAC continues to be English. Council then voted on the motion below. The motion was unanimously approved by a show of hands:

Motion: *The one language in which the official records of the meetings of the Council, Bureau, and Executive Committee shall be kept and published will be English for the period 2014-2017.*

26. Important Matters Referred to Council by Bureau Not Covered by Items on Council Agenda

Prof. Deplanque reported that there were no important matters referred to Council by the Bureau.

27. Election of Union Officers and Bureau Members and Approval of Elected Officers of Divisions

The election slate (nominees for Vice President and for Elected Members of the Bureau) and information about each of the candidates may also be found in the Agenda Book.

The elections for Vice President and Bureau Members were held as announced earlier, at 9:30 hours on 15 August 2013.

In the election for Vice President, there were 106 votes for Prof. Natalia Tarasova (Russia) and 51 Prof. Qi-Feng Zhou (China/Beijing). Prof. Natalia Tarasova was elected Vice President.

The following 7 candidates were elected on the Bureau:

Prof. Russell J. Boyd (Canada)	116 votes
Prof. Tavarekere K. Chandrashekar (India)	113 votes
Prof. Richard Hartshorn (New Zealand)	129 votes
Mr. Colin Humphris (United Kingdom)	129 votes
Prof. Christopher K. Ober (United States)	149 votes
Prof. Kaoru Yamanouchi (Japan)	135 votes
Prof. Qi-Feng Zhou (China/Beijing)	155 votes

The following motion was passed:

Motion 1: *Council ratifies the election of Natalia Tarasova as the new Vice President and of Elected Members of the Bureau named above.*

Elections for Divisional offices had been completed prior to the Council Meeting, as is the normal procedure, and only required final ratification by the Council. The names of officers continuing their current terms of office are here below included for completeness.

Division I-Physical and Biophysical Chemistry Division
Roberto Marquardt – President 2014-2015, France
Angela K. Wilson – Vice President 2012-2015, USA
Assaf Friedler – Secretary 2012-2015, Israel
Kaoru Yamanouchi – Past President 2014-2015, Japan

Division II-Inorganic Chemistry Division
Jan Reedijk – President 2014-2017, Netherlands
Lars Öhrström – Vice President 2014-2017 Sweden
Markku Leskelä – Secretary 2012-2015 Finland
Robert D. Loss – Past President 2014-2015 Australia

Division III-Organic and Biomolecular Chemistry Division
Mary J. Garson – President 2014-2015, Australia
Margaret A. Brimble – Vice President 2014-2015, New Zealand
Axel Griesbeck – Secretary 2012-2015, Germany
Krishna N. Ganesh – Past President 2014-2015, India

Division IV-Polymer Division
Michael Buback – President 2012-2015, Germany
Gregory T. Russell – Vice President 2014-2015, New Zealand
Michael Hess – Secretary 2012-2015, Germany

Division V-Analytical Chemistry Division
D. Brynn Hibbert – President 2014-2015, Australia
Jan Labuda – Vice President 2014-2015, Slovakia
Zoltán Mester – Secretary 2012-2015, Canada
M. Filomena Camões – Past President 2014-2015, Portugal

Division VI-Chemistry and the Environment Division
Laura M. McConnell – President 2012-2015, USA
Petr Fedotov – Vice President 2014-2015, Russia
Hemda Garelick – Secretary 2014-2017, UK

Division VII-Chemistry and Human Health Division
Thomas Perun – President 2014-2015, USA
Rita Cornelis - Vice President 2014-2015, Belgium
Michael Schwenk – Secretary 2010-2017, Germany

Division VIII-Chemical Nomenclature and Structure Representation Division
Karl-Heinz Hellwich – President 2014-2017, Germany
Ture Damhus – Secretary 2008-2015, Denmark
Richard M. Hartshorn – Past President 2014-2015, New Zealand

The following motion was passed:

Motion 2: *Council ratifies the selection of Division Officers that has been completed previously during individual divisional elections coordinated through the IUPAC Secretariat.*

28. Any Other Business

28.1. The National Adhering Organization from Belgium requested that the following items be added to the Agenda for the Council Meeting for information, discussion and possible decision.

(a) In what manner may new contacts be established by IUPAC with major international organizations (e.g., European Commission, the World Health Organization, International Agency for Research on Cancer, UNESCO, World Meteorological Organization, *et alia*). Is there an established procedure for doing this and how is the decision made?

(b) Would it be possible for the Officers of IUPAC to highlight during the Council Meeting what the expectations of the NAOs sponsoring IUPAC should be due to their sponsorships and to give a brief summary of the Statutes and Bylaws of the Union (a copy of the current Statutes and Bylaws is attached below in the Agenda Book)?

(c) Is there any evidence that IUPAC Standards and Recommendations are acknowledged and applied by big emerging industries in the fast-growing countries (BRICS, African Countries, *et alia*)?

Prof. De Bievre introduced these questions and added CCQM (the BIPM Consultative Committee for Amount of Substance) to the list under (a) above. He stressed that at CCQM for instance it might appear that scientific decisions are taken on political ground, and not scientific; he asked how does IUPAC stand in relation with such decisions.

Colin Humphris from UK suggested that the Bureau should take this question and report at the next Council meeting.

28.2. Professor Bob Loss, President of the Inorganic Chemistry Division (Div II) informed the Council that the Commission on Isotopic Abundances and Atomic Weights (II.1) has met in Gebze, Turkey, prior to the General Assembly. Following its meeting, the Commission recommended the changes to the Atomic Weights as presented by the Division II president during his report.

> The standard atomic weights of cadmium, molybdenum, selenium, and thorium have been changed based on recent determinations of terrestrial isotopic abundances. In addition, the standard atomic weights of 15 elements have been revised based on the new assessment of their atomic masses by International Union of Pure and Applied Physics.

The following changes in the standard atomic weights have been made:

aluminium (aluminum): from 26.981 5386(8) to 26.981 5385(7)
arsenic: from 74.921 60(2) to 74.921 595(6)
beryllium: from 9.012 182(3) to 9.012 1831(5)
cadmium: from 112.411(8) to 112.414(4)
caesium (cesium): from 132.905 4519(2) to 132.905 451 96(6)
cobalt: from 58.933 195(5) to 58.933 194(4)
fluorine: from 18.998 4032(5) to 18.998 403 163(6)
gold: from 196.966 569(4) to 196.966 569(5)
holmium: from 164.930 32(2) to 164.930 33(2)
manganese: from 54.938 045(5) to 54.938 044(3)
molybdenum: from 95.96(2) to 95.95(1)
niobium: from 92.906 38(2) to 92.906 37(2)
phosphorus: from 30.973 762(2) to 30.973 761 998(5)
praseodymium: from 140.907 65(2) to 140.907 66(2)
scandium: from 44.955 912(6) to 44.955 908(5)
selenium: from 78.96(3) to 78.971(8)
thorium: from 232.038 06(2) to 232.0377(4)
thulium: from 168.934 21(2) to 168.934 22(2)
yttrium: from 88.905 85(2) to 88.905 84(2)

These changes in the standard atomic weights will be published in a new "Table of Standard Atomic Weights 2013", which will be published in *Pure and Applied Chemistry* in 2014. The proposed changes will be published in a press release to be distributed after the General Assembly.

This was a Bureau proposal that did not require a floor motion. Voting was by delegation cards, with a simple majority of votes cast required for approval.
There were one vote abstaining, no vote against; the following motion was therefore approved:

Motion: *Council approves the Press Release on proposed changes to the atomic weights resulting from recent deliberations by the Commission on Isotopic Abundances and Atomic Weights after its meeting in Gebze, Turkey.*

(The final release was posted on the IUPAC website on 24 Sep 2013: http://www.iupac.org/news/news-detail/article/standard-atomic-weights-revised-v2.html)

28.3. Other questions from the assembly

Prof. Alan Krief (IOCD Executive Director) presented himself as a Young Observer from 1997; he asked if IUPAC values the voices of the Young Observers so much, why do they have no voting rights?

Dr. ThaoNguyen Nguyen, a 2013 Young Observer from UK presented the preview of the video project the YOs have initiated during the GA; in this project they recorded their

experiences as YOs. They hope to expand the recording and provide encouragement for future YOs to get engaged in IUPAC activities.

(The video was released on 23 Nov 2013: http://www.youtube.com/watch?v=g_yFZeqcTgo)

29. Closing Remarks, Adjournment

By way of pre-closing remarks, Vice President Cesa highlighted how the strategic review will proceed. He announced that a core team including Richard Hartshorn, Natalia Tarasova, Maria Van Dam-Mieras, Javier Garcia-Martinez, Jung-Il Jin will be consulted to develop the necessary background information and to update the Union's goals and vision.
The initial and basic questions will be: 1) how effective is IUPAC today? 2) Looking forward to centennial, if IUPAC is to remain effective, what will it look then? 3) how to go from here to there? Dr. Cesa invited the NAOs to consider these questions and announced that he will be reaching out to the NAOs for input.

President Tatsumi thanked the delegates for their active participation and cooperation in making the Council meeting a friendly assembly where questions are debated. He thanked Professor Nicole Moreau for her diligent service to IUPAC, in particular for being president during the International Year of Chemistry. He also recognized with appreciation the willingness of Dr. Terry Renner to coordinate this assembly. He wished the delegates a safe journey back home.

Prof. Tatsumi adjourned the Council meeting.

For reference, the Agenda Book for the IUPAC Council meeting in Istanbul is available for direct download as one PDF (17.3 MB) from http://iupac.org/ga/47th/47thagenda

The actions taken at IUPAC Council and Bureau, Istanbul 2013 were released on www.iupac.org on 6 Sep 2013 – see http://www.iupac.org/news/news-detail/article/actions-taken-at-iupac-council-and-bureau-istanbul-2013.html

International Union of Pure and Applied Chemistry

96th MEETING OF BUREAU
Web-based GoToMeeting27 May 2015

Draft Decisions and Actions for Approval at the 97th Bureau Meeting Busan 11th August 2015

1. Bureau Members taking part in the Virtual Bureau meeting:

Prof. Christopher Brett, Portugal	Prof. Roberto Marquardt, France
Dr. Mark Cesa, *RTP Office*, USA	Dr. Laura McConnell, USA
Prof. John Corish, Ireland	Prof. Christopher Ober, USA
Prof .Mary Garson, Australia	Dr. Thomas Perun, USA
Prof. Richard Hartshorn, New Zealand	Prof. Jan Reedijk, Netherlands
	Prof. Natalia Tarasova, Russia
Dr. Karl-Heinz Hellwich, Germany	Prof. Kazuyuki Tatsumi, Japan
Prof. D. Brynn Hibbert, Austria	Prof. Ron Weir, Canada
Mr. Colin Humphris, UK *RTP Office*	Dr. Bernard West, Canada
Prof. Ram Lamba, Puerto Rico	Prof. Kaoru Yamanouchi, Japan
Ms. Bonnie Lawlor, USA	Prof. Qi-Feng Zhou, China,

Secretary: Dr. Lynn M. Soby, RTP Office, USA
Present: Dr. Fabienne Meyers, USA
Absent: Prof. Russell Boyd, Canada; Prof. Michael Buback, Germany; Prof. Tavarekere Chandrashekar, India; Prof. Mei-Hung Chiu, Taiwan; Prof. Leiv Sydnes, Norway

2. A request for additional agenda items was made. The Agenda was approved without additions.

3. The Minutes of 95th Meeting of Bureau in Coimbra Portugal were approved subject to approval of an update of the Division VIII report. This was received following the meeting. It was agreed that actions arising should be addressed at the 97th meeting of Bureau in Busan on 11th August 2015.

4. The Minutes of the 153rd meeting of Executive Committee were noted by Bureau in relation to the following Executive Committee Decisions:

    - The approval for the recruitment of a financial controller.
    - The approval and completion of the office move that was required on the termination of the previous office lease.
    - The commissioning of the company TheeDesign to develop the new website iupac.org.
    - The agreement with De Gruyter for the development of the IUPAC "Standards Online Database" as an added value search tool to enhance Pure and Applied Chemistry. Bonnie Lawlor commended the Task

Group's effort working with De Gruyter on the database development. Mark Cesa thanked the group for their fine effort.

- The approval of revised Terms of Reference for the Committee on Publications and Cheminformatics Data Standards (CPCDS) to go forward to Council.
- The approval of revised Terms of Reference for the Evaluation Committee (EvC) to go forward to Council.

5. Financial Matters
    - A financial update by Treasurer was noted by Bureau.
    - The payment status of NAOs and ANAOs was reviewed by the Executive Director with particular attention paid to the consequences of IUPAC Statute 9.2.
        - This states specifically that any Adhering Organization in arrears for a period of 24 months from the due date shall automatically cease to be a member of the Union. In response to the question of the process for readmission of such Adhering Organizations, Bureau agreed that the Executive Committee should develop appropriate policy guidelines and review the relevant Statutes. **Action: Executive Committee**.
        - Statute 9.2 also has implications for the membership of bodies of the Union for all persons belonging to an Adhering Organization that ceases to be a member. They can continue to the end of their period of service only at the discretion of the Bureau. It was agreed that Prof. Javier Garcia of Spain could continue as a member of Bureau until the end of his period of service in December 2015. If he chooses to attend Busan, his support would be as a Bureau member in his current term.
    - The status of Associated Organizations that are well in arrears was also reviewed and a recommendation to terminate their associated status approved to go forward to Council.
    - The draft of the Finance Committee Meeting of February 2015 was noted.
    - The budget for 2016-17 was reviewed and approved. The proposed National Subscriptions calculated using the Council approved algorithm were also approved to go forward to Council, however there were concerns over the wide variations in national increases despite limiting overall growth in subscriptions to 2% per annum in US dollars. The officers were asked to develop an alternative, more equitable, interim proposal for review by Bureau prior to submission to Council; **Action: Treasurer with the Officers**. It was anticipated that the incoming Treasurer would lead a review of the basis of subscription calculations for future biennia; **Action: Treasurer elect in Busan**.

6. The progress on the Strategy Review was described by the President and well received by Bureau. Bureau members were requested to provide comments and suggestions they may have on the mission statement, vision, core values, goals and objectives by 15th June 2015; **Action: Bureau members.**

7. The Vice President's Critical Assessment was received by Bureau prior to Council. Following Natalia Tarasova's presentation and discussion, the Bureau was asked for comments and feedback; **Action: Bureau members to provide comments and feedback to Natalia prior to the General Assembly.**

8. 48th General Assembly (2015)

    - The General Assembly schedule and arrangements were reviewed and confirmed.
    - The Executive Director gave an update on the elections processes and the differing experiences across the Divisions and Standing Committees were noted. On completion of the 2015 process, the Executive Director was asked to audit the process so that the Union can build on the experience for 2017; **Action: Executive Director.**
    - An update on the organization of the 2015 WCLM was provided by Laura McConnell and Mei-Hung Chui and Bureau members encouraged to attend and support the Young Observers taking part.

9. The proposal from Canada for the 2016 Bureau Meeting to be held at McGill University in Montreal, on April 8 to 10, 2016 was approved.

10. Any Other Business. Feedback on the effectiveness of "GoToMeeting" for interim Bureau meetings was very positive. The meeting was considered a success and a good learning experience.

Respectfully Submitted,

Dr. Lynn M. Soby

Executive Director

7.1 President's Statutory Report on the State of the Union

Dr. Mark C. Cesa, President

Statute 6.23 states, "The President shall submit to each regular meeting of the Council a report on the general state of the Union." We in IUPAC have had a very eventful biennium, with many challenges and many important accomplishments. Not all of the activities of the Union in this biennium will be mentioned in this report, but contributions from all of our volunteers and staff have all had significant impact and are greatly appreciated.

This report will focus on events and accomplishments toward a principal theme underlying the major activities, namely efforts to **build a secure foundation for growth now and in the future.** Many of these activities are described in the reports of the Acting Secretary General, the Treasurer, and the Division Presidents and Standing Committee Chairs. In the following sections of this report, the major challenges and developments in the infrastructure of IUPAC and in the scientific contributions of the Union will be highlighted. Then the major efforts within the Union to position IUPAC for its second century will be emphasized, particularly the IUPAC Strategy Review.

Infrastructure

Officers

In early 2014 Secretary General Rene Deplanque resigned. To fill his unexpired term, the Bureau acted according to Statute 7.5, which states in part, "...[the Bureau] may fill temporary vacancies among the Officers pending the next regular meeting of the Council, when the Council shall fill such vacancies." The Bureau selected Mr. Colin Humphris as Acting Secretary General at its meeting in Coimbra, Portugal in April 2014, and Council is invited at this meeting to extend Mr. Humphris's appointment through the end of 2015. Mr. Humphris has done an outstanding job of bringing stability to the operations of the Union, greater structure and transparency to its processes, and sound business practices in its collaborations with its partners.

The Secretariat

The Secretariat faced some unprecedented changes beginning in 2013 with the resignation of the former Executive Director Dr. John Petersen, the resignation of Web specialist Mr. Bryan Pearson, and the departure of database specialist Mr. Paul LeClair. In response, as detailed in the Acting Secretary General's report, an interim management structure was put in place pending the hiring of the next Executive Director, and reviews of Secretariat operations were completed. The Secretariat reviews were targeted toward defining the tools and personnel skills needed for efficient operations. Dr. Lynn M. Soby was hired as our new Executive Director in July 2014. She has brought a great deal of energy to the position, she has excellent personnel management and evaluation skills, and she has worked diligently to stabilize and improve our processes in the office.

Importantly, Dr. Soby has instituted greatly improved systems for financial management of the operations of the Secretariat, and she has aligned the tasks of the office with the skills and

backgrounds of the staff. Ms. Linda Tapp, Ms. Enid Weatherwax, and Dr. Fabienne Meyers have now been joined by the newly hired financial controller, Mr. Jay Lucido. Perhaps most significantly, Dr. Soby led the selection of a new permanent office facility for the Secretariat and completed the move to the new offices in early 2015.

Finances

The Finance Committee has made important changes and contributions toward stability and growth. As a result of developments in the securities and bonds markets over the last several years, it had become increasingly difficult to identify reinvestment opportunities in the form of bonds with yields that had been achieved in past years. Also, there has been a need to draw upon the proceeds from the investments for IUPAC operations for several years. In response, the Finance Committee, led by Prof. Christoph Buxtorf, decided to engage the services of a professional investment management firm, and Dr. Soby led the selection process. The firm BB&T in North Carolina, USA has been hired and has been managing the investment portfolio since early 2015. It is hoped that this development is will position the investments for growth in the coming years.

Treasurer John Corish's reports provide detail on the many financial changes. Prof. Corish's contributions to IUPAC in the last biennium have been critically important to the establishment of improved processes for management and control of the finances.

Members

The IUPAC Web site lists the current Membership of IUPAC at fifty-seven National Adhering Organizations, three Associate National Adhering Organizations, and thirty-four Associated Organizations. There continues to be potential for the numbers of Members of the Union to continue to increase in the coming years, through the work of the Membership Relations Committee.

However, due to difficult economic circumstances, there have been larger than usual numbers of NAOs who have experienced difficulties with their National Subscriptions. The Officers, in particular the Treasurer and the Executive Director, have been working closely with each of these NAOs. A new process for readmission of Members in arrears has been approved by the Executive Committee and is now in use.

Our members and volunteers from the chemical industries constitute an important constituency within IUPAC. In recent decades substantial developments in the chemical industries, have led to increasing activity in restructuring, acquisitions and mergers. Rapid developments in industrial chemical research and development, for example globalization of research and production, have led to big changes in the expectations of industrial companies with respect to support for their scientists and interactions wil technical societies and policy-making institutions. In response, the Committee on Chemistry and Industry is reviewing the Company Associates program. COCI has completed a survey to provide the information needed to design a Company Associates program that meets current and future needs. At its meeting at this General Assembly, COCI will discuss the results of the survey and plan next steps.

7.1 President's Statutory Report on the State of the Union

Communications

The Acting Secretary General's report details progress on the issues around the collaboration with the publisher De Gruyter for our publications, *Pure and Applied Chemistry* and *Chemistry International*. Publication of *PAC* by De Gruyter is working well due to the collaborative efforts of the Committee on Publications and Cheminformatics Data Standards (CPCDS), let by Dr. Bonnie Lawlor; the Interdivisional Committee on Nomenclature, Terminology and Symbols (ICTNS), led by Prof. Ronald Weir; the new Scientific Editor Prof. Hugh Burrows; and the ASG. Issues surrounding the preparation and publication of *Chemistry International* are receiving close attention. Dr. Fabienne Meyers's continuing work as Managing Editor of CI through the transition with De Gruyter is gratefully acknowledged.

It has been recognized for some time that the IUPAC Web site needs attention. A committee led by Dr. Bonnie Lawlor of CPCDS is working with Dr. Soby and the design firm TheeDesign to build a new Web site. A demonstration version of the new site is expected to be available at this GA. More details can be found in the Acting Secretary General's report and the report of CPCDS.

Science

IUPAC exists to provide objective scientific information and recommendations to the worldwide chemistry community. The Divisions and Standing Committees (CHEMRAWN, Committee on Chemistry Education, Committee on Chemistry and Industry, CPCDS, ICTNS, the Project Committee and the Project Evaluation Committee) have all made substantial contributions in this biennium. Council's attention is invited to the Division and Standing Committee reports for detailed information on their accomplishments.

New Chemical Elements

Discoveries of four new chemical elements, of atomic numbers 113, 115, 117 and 118, have been claimed and are moving through the process for validation, assigning priorities to the laboratories claiming discovery, and proposal of atomic symbols and names Prof. Corish will report in more detail about these exciting developments.

In 2013, I represented IUPAC at the Lawrence Livermore Laboratory in the USA at a celebration of the discovery and naming of livermorium, element 116. As it happened, the mayor of the city of Livermore was a chemist! He was delighted that his city and the Laboratory were being honored with the name of the newly discovered element. His excitement was shared by everyone at the event, at which IUPAC received special recognition and thanks.

Collaborations with Global Organizations

Organization for the Prohibition of Chemical Weapons (OPCW)

7.1 President's Statutory Report on the State of the Union

I had the privilege of representing IUPAC at the Nineteenth Session of the Conference of States Parties of the Organization for the Prohibition of Chemical Weapons in December 2014, at which IUPAC was invited to address the Conference and to participate in the award ceremony for the first OPCW – The Hague Awards. The Awards "honor outstanding achievements in advancing the goal of full and effective implementation of the Chemical Weapons Convention and global chemical disarmament." I represented IUPAC on the selection committee for these awards as well.

IUPAC has been a partner of the OPCW for well over ten years as the organizer of a series of three Review Conferences on the Chemical Weapons Convention, at which IUPAC convenes chemists with scientific expertise in the detection and destruction of chemical weapons and in the latest relevant scientific advances. Prof. Leiv Sydnes has led IUPAC's contributions to organize and report on these events.

IUPAC has also played a key role with the OPCW Scientific Advisory Board to develop educational materials on multiple uses of chemicals. A report entitled, "Education and Engagement: Promoting a Culture of Responsible Chemistry," was issued by OPCW in November 2014. IUPAC was represented by Prof. Peter Mahaffy, Prof. Alastair Hay, Prof. Jan Apotheker and Dr. Ting-Kueh Soon on the working group that prepared the report.

Most recently, in 2015 Prof. Tarasova and I served on a task group developing ethical guidelines for codes of conduct related to the CWC. IUPAC's published recommendations on ethical guidelines for chemists provided a model for OPCW in this area. Further work is planned for later in 2015.

International Chemistry Olympiad (IChO)

Vice President Prof. Natalia Tarasova will represent IUPAC at the closing session of the International Chemistry Olympiad in Baku, Azerbaijan in July 2015. She will present awards to students with the highest scores on the theoretical and practical examinations. IUPAC's relationship with the IChO is a way for talented students early in their careers to become familiar with IUPAC and its contributions.

International Council for Science (ICSU)

I represented IUPAC at the ICSU General Assembly in Auckland, New Zealand in 2014. It was an excellent opportunity to observe this organization in action and to assess the value of IUPAC's membership in it. IUPAC has recommended the nominations of several IUPAC volunteers to committees of ICSU. In early 2015 a new ICSU project, "Accelerating participation and leadership of women in chemistry." Activities within this project at this General Assembly and Congress include the symposium, "Women in Chemistry: Gaining Momentum," and the 2015 Awards for Distinguished Women in Chemistry or Chemical Engineering, which will be presented at the Congress. The efforts of Prof. Angela Wilson, Dr. Carolyn Ribes, and all the volunteers who prepared the successful ICSU proposal and organized these activities are gratefully acknowledged.

7.1 President's Statutory Report on the State of the Union

IUPAC Safety Training Program (STP)

The Committee on Chemistry and Industry administers the Safety Training Program. This program provides opportunities for chemists and chemical engineers who are experts in health, safety and environmental protection to learn first hand about state-of-the-art practices in these fields by visiting host companies in the industrialized world for hands-on experiences with professionals at these organizations. Under the leadership of Dr. Bernard West and Dr. Carolyn Ribes of COCI, the STP has placed several new trainees at new Host Companies, and a collaboration with the CRDF (USA) has provided s financial support for selected trainees.

Representing IUPAC at Conferences around the World

In this biennium I had the privilege of attending and participating in chemistry conferences in the countries of several NAOs: China Beijing (2014 Chinese Chemical Society Congress), Colombia (COLACRO conference on chromatography), Peru (Congress of the Federacion Latinoamericana de Asociaciones de Quimica) and Kuwait (Kuwait Chemical Society annual meeting.) At all of these events the enthusiasm of the attendees, and in particular the students, was very gratifying. All of us in IUPAC can take encouragement from the strong interest all of our NAOs have in IUPAC's value.

Awards, Prizes, and Sponsorship of Research

IUPAC administers several prestigious awards for excellence in chemistry as well as programs for support of chemical research in areas of worldwide importance. The winners of the 2014 and 2015 IUPAC-Solvay International Awards for Young Chemists will be recognized at the opening ceremony of the Congress. The Committee on Chemistry Research Funding will meet at the General Assembly to assess progress on the previous two competitive grant programs and will discuss options for a third call for proposals. Additionally, grant awardees in the Green Chemistry for Life Project, launched in 2013 by UNESCO's International Basic Sciences Programme (IBSP) and PhosAgro, in close cooperation with IUPAC, will be recognized.

The Legacy of the International Year of Chemistry (IYC)

Through the efforts of Prof. Bryan Henry, past President of IUPAC and leader of the effort to establish the 2011 International Year of Chemistry, and all the contributors from IUPAC and UNESCO, the final report on the IYC, entitled, "The 2011 International Year of Chemistry: Description and Analysis of Activities," has been completed. The Executive Summary of the report can be found in the July-August 2015 issue of Chemistry International, and the full report is available at: www.iupac.org/project/2012-009-1-020. The scope of activities during the IYC were most impressive, and the activities have had a great impact on the the public appreciation of chemistry. The learnings in the report are a basis IUPAC can build on for its future, and they can serve as a guide for other organizations that are preparing International scientific years and similar celebrations.

The Future of IUPAC

Young Observers

As a former Young Observer to IUPAC, I fully appreciate the value of this important program for early career chemists. Many of our past Young Observers have joined project task groups, Division Committees and Standing Committees, and have taken positions of leadership in the Union, thereby enriching our contributions to the worldwide chemistry community. This year we have the privilege of welcoming more than twenty Young Observers from several countries to our General Assembly. Hopefully they will find the experience of the IUPAC General Assembly and Congress fulfilling, and they will be interested in participating in IUPAC in the future.

World Chemistry Leadership Meeting

The World Chemistry Leadership Meeting held at this General Assembly will focus on the topic, "IUPAC's contribution to achieving the new UN Sustainable Development Goals." Participation of our Young Observers in this meeting will provide an excellent opportunity to contribute to IUPAC's future directions. A report on the 2015 WCLM will be presented to Council at this meeting.

The IUPAC Centenary – 2019

Vice President Prof. Natalia Tarasova is leading a task group organizing activities for the 2019 centenary of IUPAC. A report on progress for this critically important activity will be presented to Council at this meeting.

Challenges for the Coming Years

IUPAC has accomplished a great deal in this biennium, but some significant challenges remain. The Union would like to continue to increase the numbers of volunteer and Members; improve transparency in all its processes and communications; grow its revenues and reserves; and to continue to improve its publications and its Web site for maximum utility for its volunteers, Members, and the chemistry community. The Union would like to establish stronger linkages with organizations fostering chemical research, commerce, and policy, and in particular with regional organizations and organizations devoted to sciences related to chemistry. IUPAC should continue to devote efforts toward revitalization through diversity and inclusiveness in membership, focusing on scientific excellence. IUPAC is poised now to accomplish all these things in the next years.

Strategy Review

The IUPAC strategy has been reviewed and updated to develop a new IUPAC Strategic Plan. The new strategic plan aims to define IUPAC's unique role and value within the chemical enterprise so that the Union's contributions are recognized for their impact in ways that no other chemical society or organization can do alone. Clear and consistent communication of IUPAC's contributions and value to the broader chemistry community, other unions, and the public can result. This new vision has been agreed that is expected to help generate new projects in new

areas that focus on issues of strategic importance to IUPAC. The Strategy Review and the new IUPAC Strategic Plan are the subject of Agenda Item 7.2, and the report on the Strategy Review is included in the Council Agenda Book.

Summary

While there is much that remains to be done, we have built a secure foundation for IUPAC to grow. Our infrastructure, Secretariat, investments, membership base, and communications have all received attention to stabilize our operations and provide the platform for further advances. Throughout the biennium, our science has progressed at an admirable pace, one we can all be proud of. We have achieved a position where we are now well poised for the next biennium and the next century of IUPAC.

It has been a great honor and privilege to serve the Union in this biennium. It has been the experience of a lifetime. I believe strongly in its vision, mission, core values, goals and objectives, and I have been delighted to be able to work with so many of you who share in that belief. I look forward to watching IUPAC achieve even greater things in the coming years.

Acknowledgments

I would like to thank Colin Humphris, Sean Corish, Natalia Tarasova, Kaz Tatsumi, and Lynn Soby for their extraordinary devotion to IUPAC in this biennium. We have worked together as a team every day. It has been a pleasure to be associated with all of them.

I would like to thank the members of the Executive Committee and Bureau as well for their dedication and hard work. We have called upon both bodies in this biennium for quite a bit more than IUPAC has done in the past, and they have served the union well.

Thanks as well to all our Member organizations for your continued support, encouragement, and constructive suggestions for improvement. IUPAC exists to serve you, our stakeholders – please continue to make your needs known.

Finally, thank you to all of IUPAC's volunteers for your commitment to and support of all of IUPAC's work. IUPAC's successes are the result of the contributions of our volunteers – IUPAC needs you and is grateful for all you do.

Respectfully submitted,

Mark C. Cesa, Ph.D., President

7.2 IUPAC Strategy Review

Dr. Mark C. Cesa, President

Summary

The IUPAC strategy has been reviewed and updated to develop a new IUPAC Strategic Plan. The new strategic plan aims to define IUPAC's unique role and value within the chemical enterprise so that the Union's contributions are recognized for their impact in ways that no other chemical society or organization can do alone. Clear and consistent communication of IUPAC's contributions and value to the broader chemistry community, other unions, and the public can result. This new vision is expected to help generate new projects in new areas that focus on issues of strategic importance to IUPAC.

Background

Strategic reviews of IUPAC were carried out in the late 1990's and early 2000's. A critical outcome of those reviews was the establishment of the project system. While the project system has proven to be very successful, in the twelve years since the most recent strategy was developed great advances have been made in chemistry and in the sciences in general. IUPAC needs to respond to these changes so that its projects, recommendations, conferences, publications, and other contributions continue to serve the chemistry community effectively. While IUPAC's work processes, finances, and public face are all undergoing review and improvement, a new strategy review was recommended as part of the 2013 Vice President's Critical Assessment. This recommendation was endorsed by the IUPAC Bureau, and the review was instituted in the current biennium. This strategy review focused on the following critical questions:

- How should IUPAC balance its emphasis on its traditional strengths in chemistry with new and emerging science?
- How should IUPAC distinguish itself from other organizations serving aspects of the chemistry community?
- How can IUPAC make its knowledge and expertise usable to benefit the greater society, and in particular the developing world?

A particular emphasis of the strategy review was to define the unique role of IUPAC within the chemistry enterprise so that the Union can distinguish itself as a necessary and valued contributor to the advancement of chemistry. Another was to help establish ways that IUPAC can assist the chemistry community in collaborating with scientists in other fields, engineers, technologists, and policy makers to solve critical world problems through its in-depth knowledge of the chemical sciences.

The following report describes the process by which the strategy review was carried out, the results of the review, and the anticipated next steps to incorporate the new strategic plan into IUPAC's structure and functions.

7.2 IUPAC Strategy Review

The Process

Under an IUPAC project (2014-042-2-020) funded from the Strategic Opportunities Fund, a task group was assembled to carry out the strategy review. The members of the task group are:

Prof. Richard Hartshorn. Elected Member of Bureau
Prof. Maria van Dam-Mieras, former Elected Member of Bureau
Prof. Jung-Il Jin, Past President
Prof. Javier Garcia Martinez, Elected Member of Bureau
Prof. Natalia Tarasova, Vice President and President-Elect
Dr. Laura McConnell, President, Chemistry and the Environment Division (VI)
Dr. Lynn Soby, Executive Director
Dr. Fabienne Meyers, Associate Director
Dr. Mark Cesa, President

Gathering Information

The task group developed a Web-based survey that was designed to provide answers to the following questions:

- How can IUPAC be characterized today?
- What should be IUPAC's vision of a successful Union in 2019 and beyond?
- How can IUPAC reach that goal?

The survey asked respondents to list IUPAC's strengths and areas for improvement with a focus on the most important things that the Union should continue, as well as aspects that it should de-emphasize. The survey was sent to a broad group of IUPAC's stakeholders. Over 3,000 IUPAC volunteers, Fellows, National Adhering Organizations, Associated Organizations, Company Associates, Young Observers, and persons outside the Union received the survey. More than ten percent of these persons responded, and a wealth of constructive information was gathered.

The respondents emphasized the importance of IUPAC's contributions in nomenclature, terminology, symbols, standards, analytical methods and conferences – the things for which IUPAC is best known. They noted IUPAC's reputation for objectivity and consensus-building as strengths. They showed concern about the effectiveness of IUPAC's processes for communication both internally and externally, about the IUPAC Web site, about IUPAC's finances, and about the Union's relative slowness in reaction to changes in the field of chemistry. They encouraged IUPAC to strengthen its contributions to the developing world, to enhance chemistry education efforts, and to emphasize greater diversity in its membership with respect to age, gender, geography, and training, asked for greater participation by industrial scientists, and called for greater transparency in IUPAC's work processes, particularly the recruitment and retention of volunteers and Members.

Simultaneous with the survey was a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) carried out by the members of the task group, to provide further background for the development of the strategy review and as a comparison against the results from the survey. The

results identified in the SWOT analysis were broadly consistent with the results of the survey. Opportunities were found for improving communications, growth through strengthening ties with regional scientific organizations, international cooperation, and in the Union's financial health.

Developing the Strategic Plan

To bring this information to bear to develop a new vision statement and mission statement, core values, goals and objectives, an external facilitator was engaged. The facilitator guided the work of the task group by presiding over a face-to-face meeting of the task group to synthesize the information from the survey and SWOT and develop a new strategic plan. Mr. Wayne Dunlap, an experienced strategic planner and facilitator in Research Triangle Park, NC USA, agreed to work with the task group. Mr. Dunlap brought experience in developing strategic plans for new products and processes in the chemical and pharmaceutical industries, and as well contributed his unique perspectives from outside the Union to the task group. The task group met at the new Secretariat offices in May 2015 for two days.

Mr. Dunlap led the task group through a structured process to clarify IUPAC's current situation and needs, identify its stakeholders, develop its vision statement, core values and mission statement, an analysis of IUPAC's stakeholders, a second SWOT analysis, identify critical issues, and set strategic goals and specific and quantifiable objectives.

The task group articulated IUPAC's unique role in the world chemistry community as follows:

- A focus on those aspects of chemistry where global consensus is essential for progress in research, commerce and policy.
- Respect for its objectivity and scientific excellence, providing access to the highest levels in the scientific, industrial, and policy communities to represent global chemistry
- A worldwide base of volunteers with the best skills and background, recruited by transparent and well-understood processes.

IUPAC's unique role in the worldwide chemistry community summarizes its value to its Members and stakeholders. IUPAC, with its global reach, can effectively convene the chemistry community through its Members and volunteers to address global needs through the contributions from the chemical sciences.

The new statements of the IUPAC strategy derive from IUPAC's unique role. The new IUPAC Strategic Plan shown on the last page.

The Strategic Plan

The vision statement describes how IUPAC wishes to be regarded by its stakeholders. The IUPAC vision statement builds upon the Union's core values and mission, and it emphasizes the value of IUPAC to the global chemistry community.

7.2 IUPAC Strategy Review

The mission statement articulates IUPAC's purpose for its stakeholders. It describes what IUPAC does (provide chemistry expertise and develop essential tools,) how it does these things (by fostering sustainable development, providing a common language, and advocating free exchange of information,) and why (for the benefit of humankind and the world.)

The core values provide the foundation of the strategy. They are principles that guide the conduct of the Union and its relationships with its stakeholders. IUPAC's core values emphasize scientific excellence, communication, transparency, diversity, and ethical behavior. These behaviors are practiced by all of the Union's volunteers, staff and stakeholders.

The long-range goals are the basic framework, derived from the strategy, that are the focal points of the Union's efforts. The address the major issues raised in the survey and the SWOT analysis.

The shorter-term objectives are the highest priority tasks for the coming years. They demonstrate an emphasis on IUPAC's unique role in the world chemistry community. Some of the objectives are focused on specific bodies of the Union, such as the Secretariat and supporting groups; others will call on efforts from all of the Divisions and Standing Committees.

Reviewing the Strategic Plan

At the "virtual" Web-based meeting of the Bureau in late May 2015, this new high-level strategic plan was presented. The plan was well-received, and the Bureau voted to endorse it.

Subsequent to this Bureau meeting, Bureau members and NAOs were presented with the high-level strategic plan and were asked for their comments in answer to three yes/no questions:

- Do the mission statement, core values, goals and objectives capture the unique role and value of IUPAC in the world of chemistry?
- Do the mission statement, core values, goals and objectives emphasize the continuing need for IUPAC to improve and enhance its resources: finances, volunteers, and stakeholders?
- Do the mission statement, core values, goals and objectives express IUPAC's commitment to responsiveness and relevance in the rapidly changing field of chemistry, the sciences in general, and world needs?

They were also asked to comment on their answers as they saw fit. The responses, from five National Adhering Organizations and thirteen Bureau members, was very positive, and constructive suggestions regarding emphasis on specific goals, improved wording of the strategy statements, and implementation of the strategy. These suggestions were incorporated as needed into the statements in the Strategic Plan.

Next Steps

First, the task group, based on the endorsement of the Bureau, is asking for endorsement of the new Strategic Plan from the Council at this meeting.

7.2 IUPAC Strategy Review

With Council's endorsement, the new Plan will be published on the IUPAC Web site, and an article in *Chemistry International* will be published describing the Strategic Plan and encouraging promulgation of the Plan. The Divisions and Standing Committees will be encouraged to align their activities with the strategy, with the goal of generation of new projects, particularly in collaboration with each other and outside the chemistry community to solve world problems, and enhancing diversity in our volunteer base. At the same time, the Secretariat is already aligning with the new plan as it establishes its new work processes; the Finance Committee has already established a collaboration with professional financial advisors to manage and grow our investments; our publications are moving forward to beneficial effect with our partner De Gruyter; and the Web site is being re-designed with improved communication, stability, and data access in mind, just to name a few examples.

The IUPAC Strategic Plan is intended to be a "living document," and regular reviews and adjustments will be required to assure continued alignment with the rapidly evolving field of chemistry and the needs of the worldwide chemistry community.

All of us on the Strategy Review Task Group are excited about the new Strategic Plan and are eager to make its implementation a success. We believe that the Strategic Plan positions the Union well as we move to our centenary in 2019 and our second century of highly valued contributions to chemistry.

Acknowledgments

I would like to acknowledge all the hard and productive work of the members of the strategy review task group, whose names are listed in this report. We are grateful as well to all of our volunteers and Members who provided input to the development of the strategic plan through the survey, comments in response to requests for information, and for their encouragement. Particular thanks are due to Mr. Wayne Dunlap for his effective facilitation of the task group meeting that led to the Strategic Plan. Finally, thanks to everyone at this Council meeting for your support and encouragement. Your continued input and suggestions are always welcome.

Respectfully submitted,

Dr. Mark C. Cesa, President, for the Strategy Review Task Group:

Prof. Richard Hartshorn. Elected Member of Bureau
Prof. Maria van Dam-Mieras, former Elected Member of Bureau
Prof. Jung-Il Jin, Past President
Prof. Javier Garcia Martinez, Elected Member of Bureau
Prof. Natalia Tarasova, Vice President and President-Elect
Dr. Laura McConnell, President, Chemistry and the Environment Division (VI)
Dr. Lynn Soby, Executive Director
Dr. Fabienne Meyers, Associate Director

7.2 IUPAC Strategy Review

IUPAC Strategic Plan 2015

VISION

IUPAC is an indispensable worldwide resource for chemistry.

MISSION

The International Union of Pure and Applied Chemistry is the global organization that provides objective scientific expertise and develops the essential tools for the application and communication of chemical knowledge for the benefit of humankind and the world.

IUPAC accomplishes its mission by fostering sustainable development, providing a common language for chemistry, and advocating the free exchange of scientific information.

CORE VALUES

We serve humankind by advancing chemistry worldwide.

- Scientific excellence and objectivity are the cornerstones of all our work.
- We value collaboration and communication among all our stakeholders.
- We strive for diversity and inclusiveness in all forms.
- We respect each other and the Union.
- We uphold the highest standards of transparent, responsible and ethical behavior.

GOALS (short term and long term)

Provide scientific expertise to address critical world needs.
Increase the value of our products and services.
Improve the vitality, effectiveness and efficiency of our Union.

OBJECTIVES (short term – substantial progress in coming biennium)

Brand IUPAC in the minds of stakeholders
Improve quality and frequency of communication with stakeholders
Increase revenues and improve long-term financial stability
Expand and retain Member and volunteer base with an emphasis on diversity and inclusion.
Enhance interdivisional interaction and collaboration
Emphasize multidisciplinary projects addressing critical global issues
Support chemistry education, particularly in developing countries

VICE-PRSIDENT CRITICAL ASSESSMENT OUTLINES

I. The IUPAC Project System

The second decade of the 21st century will be crucial from the point of the limitation of the population, industry and pollution growth trends. A central emphasis on decoupling incomes and economic growth from environmental resource use and pollution will become a key trend for the industries. This decoupling will require deep changes to technologies, production systems, and individual behaviors in every country that must be sustained over the long term. The strengthening of cooperation of the IUPAC and chemical and related branches of industries through joint programs and projects is needed, so that collective, rather than self-centered goals might be adopted and the time horizon used in making choices, increased. IUPAC has a great potential in this domain, based on CHEMRAWN and COCI activities, as well as on joint programs of divisions and related branches of chemical industries. "Thinking in systems" approach might help to convert this potential into practical deeds and develop and promote sustainable indicators of success.

1. How are the projects initiated?
2. The geographic and gender structure of the TGMs.
3. The dissemination of the results. How effective is the system of assessment?
4. The valuation of the project system by the NAOs (the "customers").
5. How to stimulate the involvement of young scientists into TGs?

II. Sharing collective experience

To help the society to appreciate chemistry is one of the key goals for IUPAC. The momentum gained during the IYC should be used by the IUPAC in communicating to the society and helping it to hear the music of chemistry in the everyday life. It is very important to preserve all kinds of diversity in the era of globalization. The potential of

young chemists should be effectively used for this purpose, in a combination with the life experience of the elder generations of chemists. NAOs and ANAOs are the intrinsic source of the diversity. To collect and analyze their practical experience, help in sharing it, while increasing the number of NAOs, is seen as one of the IUPAC priorities.

1. How is the NAOs practical experience collected and analyzed?
2. How does the IUPAC help to share it? The example of the IYC and it's legacy.
3. Is to increase the number of NAOs and ANAOs still the priority?

III. Gender and generations

Recent global survey (published June 15th, 2015) reveals that female scientists are more likely to be dissatisfied with salary/benefits, job availability, gender barriers, and how they feel valued as scientists than their male colleagues.
The potential of young chemists should be effectively used, in a combination with the life experience of the elder generations of chemists.

1. Gender and age composition of divisions and committees: is it sustainable?
2. Young observers, young chemists' prizes and programmes: did they help to increase the geographic diversity of the IUPAC constituency? What else?
3. "Accelerating Participation and Leadership of Women in Chemistry" – example of successful project application to ICSU.

IV. Education

Education might be interpreted as the non-genetic heredity of the humankind, which helps it mitigate the challenges (local, regional and global), increase the resilience and thus adapt to change. The modern chemical education is highly interdisciplinary. It is very important to translate the best educational practices IUPAC has developed, to other educational fields using the UNESCO networks. It might become a vital contribution to the fulfillment of the Sustainable Development Goals.

1. Sustainable Development Goals in the context of chemistry education.

V. The IUPAC Centennial

The task group will discuss and present some ideas during the GA.

VI. The deliberate noncatastrophe

“The most elegant forms of management decisions involve problems that never have to be solved because they are prevented from occurring. They are anticipated and sidestepped. The deliberate noncatastrophe is one of the most impressive contributions a manager can make.” (Courtesy of Dennis L. Meadows)

1. The IUPAC Strategy revision.
2. The reorganization of the Secretariat.
3. The new role of the FC.
4. The modernization of the IUPAC web site.

Secretariat on the Move

by Colin Humphris
IUPAC Acting Secretary General

January 2015 was a momentous time for the IUPAC Secretariat—at the end of the month it moved from 104 T.W. Alexander Drive, Building 19, Research Triangle Park, North Carolina 27709 after 17 years in what was actually a spacious, but nevertheless temporary, wooden building. Some referred to it as a trailer, Europeans would probably call it a large porta-cabin. Most volunteers will have had dealings with the Secretariat, but few actually enjoyed a visit.

This was the time of former Executive Directors John Jost and Terry Renner, a time of stories of spiders and snakes and the need to reinforce the floor given the huge weight of books stored there. An audit conducted just before the move showed a stock of about 7400 IUPAC publications. We are currently finding good homes for these, while old records will be archived at the Chemical Heritage Foundation.

I had always understood that the great advantage of Building 19 was that we paid a 'peppercorn' rent of $1 a year. This was indeed the case, but the full occupation costs for the building were actually much higher—close to $20,000 in 1997 and rising to approximately $45,000 in 2014. In this regard the accommodation was sub-standard, with poor safety and security; poor heating, cooling and plumbing; a leaking roof; and 1990s IT infrastructure.

Last year it became clear that the time was up for Building 19. A lease renewal was not an option, as the building stood in the way of a new development. Without the books to hold it up I don't expect that demolition will be too tricky!

Our new home is 79 T.W. Alexander Drive, Research Commons Building 4201, Suite 260, Research Triangle Park, NC 27709. This is class 'A' office accommodation offering modern standards of safety and security, as well as services including state of the art broadband IT.

Located in the building will be Executive Director Dr. Lynn Soby, Accounting Manager Linda Tapp, and Administrative Assistant Enid Weatherwax. Associate Director Dr. Fabienne Meyers continues to be based remotely at Boston University.

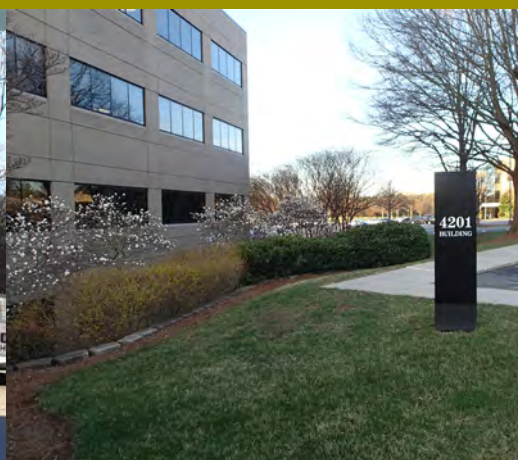
So what does the Secretariat actually do?

The Secretariat's primary roles are to:

- assist the officers in the administration of the Union
- facilitate the work of the many hundreds of volunteers within the divisions, committees and projects working on behalf of the Union
- communicate our activities through our journals and the website

To do this, the Secretariat prepares and manages against the biennial budget recommended by the Treasurer and approved by the Council. It has to achieve a balance as money comes in and goes out, given the difficulty of managing the timing of these cash flows. Income arises primarily from National Adhering Organisation (NAO) subscriptions, from publishing, and from our investments. This is why the timing of subscription payments is so critical; the later they are left the more difficult things become for the Union. Expenses include the running of the office and approximately 1000 expense claims from volunteers checked and settled, totaling some $900,000 in 2014. We can be expected to settle these claims in up to 50 different currencies, reflecting our international membership of over 60 countries.

The Secretariat maintains the books and accounts to provide management information for the Officers and Finance Committee and ensures the information required for statutory U.S. accounting of payroll and taxes is provided. It also stores data on all the categories of



membership, contacts, and customers of IUPAC, both in current and historical records. Much of the membership data is displayed on our website. The information on the website must be kept up to date and relevant.

The Secretariat is responsible for the administration of both the IUPAC project system and the endorsement or support given to IUPAC conferences. It administers General Assemblies and the associated elections, Bureau and Executive Committee meetings, edits *Chemistry International*, and facilitates the content of *Pure and Applied Chemistry*. It also manages the day-to-day business relationship with De Gruyter for publishing and distribution of the journals.

I undertook a review of our processes and systems early in 2014, including consideration of those we should handle ourselves and those we might better outsource. We had already outsourced publishing to De Gruyter and were learning how to manage that relationship and the fit with their processes and deadlines.

The process of change really accelerated with the appointment of Dr. Soby as our Executive Director in July 2014. The Secretariat payroll is now outsourced. We have reconstructed our financial accounting systems to make them compliant with General Accounting Practices and Principles (GAPP) and moved to Cost Accounting methods which will improve budgeting, financial management and enable handling and tracking with multiple currencies. Management financial information will be available to the officers in a more timely manner to help with decision making. Our investment portfolio is now actively managed by BB&T Scott & Stringfellow with the objective of improving returns.

A major source of frustration has been the structure of our databases, the accuracy of the stored information, and persistent difficulties with the link between the databases and the website. Many of you contributed to the web task group survey. One of the top five recommendations for a new website was improving the ease of uploading, updating, and editing content. There was also a recommendation that we move from the current platform, TYPO3, to one that is easier to use and for which support will be more readily available. We are on course to demonstrate new web capabilities at the upcoming General Assembly. At the same time, our databases are under review to improve accuracy and ease of access. Watch this space—we need to get it right this time. Our approach will be to outsource IT services rather than to employ a web manager, given the diversity of skills needed today.

Many of you will have responded to the survey on *Chemistry International*. We are seeking to better understand member needs in terms of content and delivery and the possible future for IUPAC.org as our web presence and communication channel.

All in all, as an officer, I can say that these are exciting times, but for the Secretariat it is really hard work that we should all recognize and appreciate. At least this work will be undertaken in more appropriate office surroundings.

Photos above, left to right: Executive Committee "time out" in the old conference room, packing up the files, end of the Road for No. 19, Linda and Enid on moving day, leaving our home for the last 17 years, and the wing of the new building. Below: The entrance to the new building

Council Agenda Item 9.

Report of the Acting Secretary General to Council
Busan August 2015

According to the Statutes, the Secretary General *"shall carry out the business of the Union as specified by the Council, by the Bureau, by the Executive Committee, or by the President, and be responsible for keeping its records and for the administration of the Secretariat".* The focus of my report is all those aspects of IUPAC that involve the Secretariat and the difficult and challenging time it has faced since the Council meeting in Istanbul. This has dominated my time as acting Secretary General. The good news is that today we have a transformed Secretariat, and importantly, developed one that is capable of evolving to provide the support the Union needs for the future. It faces the challenges of the changing world of chemistry, IUPAC's strategy review (as described by the President Dr. Mark Cesa) and opportunities that will arise for instance through Cheminformatics, and the financially constrained times (as described by our Treasurer, Professor Sean Corish). This transformation is thanks in large part to the dedication and resilience our remaining staff (Fabienne Meyers, Linda Tapp and Enid Weatherwax) and the leadership and vision of the new Executive Director, Dr Lynn Soby, who many of you will meet for the first time at this General Assembly. I reviewed the current status of the Secretariat in a recent article in *Chemistry International*, Vol 37, No. 3 May-June 2015. The text is attached to this report.

The Secretariat faced a series of significant changes:

- The resignation of Dr John Petersen early in September 2013 after just 8 months as Executive Director. This prompted a complete rethink in our approach to recruitment of his successor.
- The resignation of Professor Rene Deplanque as Secretary General in March 2014.
- The transfer of publishing of *Pure and Applied Chemistry* (PAC) and *Chemistry International* (CI) to De Gruyter at the beginning of 2014 that created a working partnership between two very culturally different organizations.
- The resignation of Bryan Pearson as web specialist in December 2013.
- The departure of Paul LeClair (database specialist) in August 2014.

In response, an interim management structure was put in place from 1st September 2013 with the Secretariat staff reporting directly to IUPAC officers in their respective areas of responsibility. I was elected as Acting Secretary General at the Coimbra Bureau meeting in April 2014 to serve until the end of the current biennium.

Executive Director Recruitment

Prior to my appointment two Secretariat reviews were undertaken. The first by Dr. Tom Tritton (Chemical Heritage Foundation) detailed the traditional working practices within the Secretariat and the impact these have had on team working

in the absence of an Executive Director. It set out suggestions for a revised profile for the role of Executive Director. In February 2014 I was asked by the Executive Committee to look deeper into the ways Secretariat performed its tasks and the systems that support this: to identify the scope for improvement in terms of effectiveness and cost. Together the reviews redefined our search requirements for our Executive Director. We needed candidates with not only a familiarity with chemistry but also relevant experience of business administration and business process innovation. I'm indebted to Dr Kathryn Hughes from the US National Adhering Organisation (NAO) for her advice on executive search in the "not for profit" sector in USA. This turned out to be far cheaper than our traditional advertising in chemistry-related magazines and led to a rather different slate of excellent candidates from those seen at the time of Dr Petersen's recruitment. Dr Soby was recruited in July 2014.

Secretariat Restructuring

A question considered in the reviews was of those tasks that would be best carried out in house and those that should be outsourced; to access specialist expertise and competence or that could be carried out more cost effectively. IUPAC had already agreed to outsource journal publishing to De Gruyter. Dr Soby has led further restructuring. Payroll and related human resources work are now outsourced. We have decided not to replace our web administrator but to rely on external support given the diversity of expertise needed and for the security of all of our IT systems.

A key task we are bringing in house is management accounting and control. Up until this year we relied on an external accountant, Leslie Davis, who provided intermittent updates of the financial position. She has now retired. The Secretariat has new accounting, GAAP compliant (Generally Accepted Accounting Principles) software and to complement this, the Executive Committee agreed to the appointment of a financial controller to undertake management accounting in a much more timely manner. This is particularly important now when money is tight, when we have to manage cash flow carefully and as, you will have seen from the Treasurer's report, when we have a high exposure to currency exchange rates. It is also important to link with the management of our financial portfolio outsourced to investment portfolio management company BB&T in November 2014, following the Executive Committee approval with advice from the Finance Committee.

Mr. Jay Lucido joined the Secretariat on July 1st 2015 as Financial Controller.

You will see from the proposed budget that we currently plan to hold the Secretariat at 5 rather than 6 employees during the 2016/17 biennium.

Office Relocation

During the reviews it became obvious that the Secretariat would need to relocate. The old office was neither up to modern standards for Health Safety and Security nor for modern communications and IT. And the lease was about to run

out. Dr Soby was able to find suitable class “A”, modern standard accommodation for the Secretariat that is more appropriate for an international organization of IUPAC's standing. The fully built up annual costs are approximately the same as our old office. The Executive Committee approved the move in January 2015 to 79 Alexander Drive, Research Commons Building 4201, Suite 260, Research Triangle Park, NC 27790. Dr. Fabienne Meyers continues to work from her office generously provided by the chemistry department at Boston University.

Implementing the Publishing Agreements with De Gruyter

The agreements with De Gruyter for *Pure and Applied Chemistry* (PAC) and for *Chemistry International* (CI) were signed in April 2013 with a requirement for transition to De Gruyter for the 2014 publishing year. Teams were established who managed this transition successfully, drawing on members from the Committee on Publications and Cheminformatics Data Standards (CPCDS), the Bureau and the Secretariat, working cooperatively with De Gruyter. This work is detailed in Ms. Lawlor's CPCDS report to Council. I want to acknowledge Ms. Lawlor's personal contribution to today's positive working relationship with De Gruyter.

The transition brought together two very different organisations; on the one hand a volunteer organization and on the other a commercial, production driven publisher. Inevitably this leads to issues in the workflows and approach but for PAC the partnership is now seen to be running smoothly.

There were a number of issues that were resolved through this time of transition. I want to focus on two.

The first was the open access to the PAC archive previously provided by IUPAC. This will continue. Constructive discussions on this issue however led to a new agreement and a project for a value added database for IUPAC Standards and Recommendations published in PAC to facilitate searches. This project is being undertaken by De Gruyter with support from IUPAC (CPCDS). It will be implemented in stages starting in 2016. The database will be fee bearing and will provide royalty income to IUPAC.

The second was the provision of PAC customer information to De Gruyter that highlighted structural difficulties with our databases. The provision of this essential information was delayed, contributing to a fall in sales of PAC in 2014. Similar issues afflicted CI distribution in 2014, complicating business and production planning.

CI continues to face other challenges. De Gruyter is primarily a publisher of scholarly journals and CI has had to change to fit with their standard publishing platforms. This is seen by many as limiting the presentational style, particularly on the Web. It is clear that the copy editing role previously undertaken by IUPAC was misunderstood and under estimated by both parties. The publishing workflow therefore requires ongoing attention. The print runs per edition are very low for an internationally distributed magazine. (approximately 3000). The

reduction to this level followed the Executive Committee decision to provide CI to Fellows (our previous volunteers) only electronically to save the high printing and distribution costs. Despite this, the net cost of CI to IUPAC in 2014 was $78,000. De Gruyter had hoped to offset this partially by selling subscriptions to CI and through advertising. Sales have not proved possible however as the current IUPAC website lacks the capability to authenticate those members entitled to free access. It has therefore remained freely available to all. A core objective of the proposed new website is to provide member authentication for 2016 enabling De Gruyter to market CI.

Looking forward, the IUPAC community needs to consider what it wants from CI, its audiences, content, style and delivery format. CPCDS were asked to undertake a survey of CI readers that is now completed and are in the process of providing recommendations for the future.

Book Publishing

Concerns were raised at the Istanbul Council meeting over control of the publishing agreements for books arising from IUPAC projects. The Bureau agreed at its meeting in Coimbra in April 2014 that all publishing agreements should be managed and held by the Secretariat. We remain keen to promote the publishing of IUPAC books and model contracts that ensure appropriate royalties to IUPAC are available from the Secretariat; their use is now a requirement for project approval.

The IUPAC Website

Tom Tritton's review highlighted what many members already understood as some of the many limitations of the current website, principally the difficulties of up-loading information and undertaking effective searches. He also questioned its suitability as the public face of IUPAC in the modern connected world. Issues encountered early in 2014 underlined the need for fundamental change.

A website survey and a review were started in April 2014 by a task group led by CPCDS. The first phase was to define a vision and priorities for a new website (details are in the CPCDS report to Council). Based on these recommendations proposals were sought from web designers. The Executive Committee approved the selection of "TheeDesign" to undertake this work. Key elements of their proposal include the use of a more modern content editor to simplify uploading of information by members, member authentication, search engine optimization, secure server hosting and web support. The objective is to provide a demonstration at the Busan General Assembly and implement for 2016.

Membership

A focus of this Council meeting will inevitably be National Subscriptions. The Bureau's Members Relations Committee, with support from the Secretariat, will however also need to address more systematically the value IUPAC provides to

all its members. Responses to enquiries about this from a number of NAOs have been made in the current biennium.

Similarly it is also important to review the value proposition to Company Associates (CA) and members our Affiliate Membership Program (AMP).

Elections to Divisions and Standing Committees

A frustration noted by the Division Presidents' meeting in April 2014 was the length of time taken to complete the elections for the 2014/15 biennium. Professor Richard Hartshorn took on the task of devising a new election schedule with help from the Secretariat. The objectives were to complete elections in time for the Busan General Assembly giving the opportunity for new members to engage with their respective Divisions and Standing Committees improving continuity. It was also intended to increase the transparency for NAOs allowing them to see how their nominees fared in the elections. It was new, placed time pressures on the Divisions and Standing Committees and proved a major team effort for the Secretariat but is substantially complete. IUPAC is far better placed going into the 2016/17 biennium. We will audit the process with a view to further improvement.

"Endorsed" Conferences

For a number of years, confusion has arisen in respect of our 'sponsorship' of conferences. 'Sponsorship' gained through the Application for IUPAC Sponsorship (AIS) is an IUPAC stamp of scientific and procedural quality. There was no financial support, a point made clear in the acceptance letter. 'Endorsed' was considered a more appropriate name. These conferences remain an important part of IUPAC's science base and an important contributor to PAC. 69 conferences have been endorsed since the 2013 Council meeting.

Modest financial support can continue to be obtained separately by Divisions or Standing Committees for Financially Supported Conferences meeting criteria relevant to either "New Directions in Chemistry" or "Scientifically Emerging Regions". Financial support was approved for 7 conferences since August 2013.

Colin Humphris
Acting Secretary General
IUPAC
July 2015

International Union of Pure and Applied Chemistry

Secretariat: P.O. Box 13757, Research Triangle Park, NC 27709-3757, USA
TEL: 1-919-485-8700 FAX: 1-919-485-8706 EMAIL: secretariat@iupac.org

Application for Readmission as an IUPAC Adhering Organization

Former National Adhering Organizations who cease to be members may reapply for membership and this document sets out the information required for application. The Council is the governing body of IUPAC, and meets every other year (odd numbered years) at the IUPAC General Assembly. Council must review all applications and is responsible for approving readmission. An application may be submitted at any time: however, applications should be received no later than one month before a Council meeting to enable a decision to be made at that Council meeting.

Guidelines/Information for becoming an IUPAC National Adhering Organization again:

(i) According to the IUPAC Statutes, a country may join the Union through only one national organization representing its chemists. This National Adhering Organization may be a national chemical council, a national society representing chemistry, a national academy of science, or any other institution or association of institutions representative of national chemical interests.

(ii) For countries in which there is not a single body that represents all chemists, a National Chemistry Committee for IUPAC may be formed to act as the NAO. This committee should represent all members of the various chemical societies.

(iii) The word country may include a specific geographic territory that is widely recognized as having the cultural and administrative characteristics usually associated with an independent state but without necessarily having complete independence or sovereignty.

(iv) A former National Adhering Organization can only reapply as a National Adhering Organization.

(v) NAOs pay National Subscriptions annually to IUPAC. The amount of the National Subscription is based on the chemical turnover for that country, with a minimum National Subscription of USD 1 000. The chemical turnover is the value of chemical products produced in a country as reported by UNIDO and/or CEFIC.

(vi) The National Adhering Organizations are the Members of the Union.

Former National Adhering Organizations should complete the application as follows depending on the reason for the cessation of membership.

1. **For an organization whose subscriptions were fully paid up, the following items should be included:**

   (i) A letter from the organization addressed to the President of IUPAC formally reapplying National Adhering Organization Status in IUPAC.

   (ii) The letter should include a description of the circumstances that led to the cessation of membership and an explanation of how these have now changed enabling the application.

   (iii) A copy of any changes to the Statutes & Bylaws of the organization that may have occurred since the cessation of membership, if they are available in English, or a summary in English if the originals are available only in another language

   (iv) A brief description of any changes to the goals of the organization and its significant activities.

Application for IUPAC Adhering Organizations

Or,

2. For an organization that ceased membership whilst payment of their subscriptions was in arrears (as described in IUPAC Statute 9.2), the following items should be included:

(i) A letter from the organization addressed to the President of IUPAC formally reapplying National Adhering Organization Status in IUPAC.

(ii) Confirmations that all invoiced subscriptions that are in arrears have been paid to IUPAC. If the subscription for the year of application is paid, the National Adhering Organization will be able to vote at the Council meeting once readmission is approved as allowed for in IUPAC Bylaw B1.

(iii) The letter should include a description of the circumstances that led to the cessation of membership and an explanation of how these have now changed enabling the application. In particular the applicant should explain the steps taken to ensure that the National Adhering Organization does not fall into arrears in future.

(iv) A copy of any changes to the Statutes & Bylaws of the organization that may have occurred since the cessation of membership, if they are available in English, or a summary in English if the originals are available only in another language

(v) A brief description of any changes to the goals of the organization and its significant activities.

Please return an electronic copy of the completed application and enclosures to the IUPAC Secretariat by e-mail to secretariat@iupac.org. Printed materials should be submitted to the above address.

For administrative use only	*Submitted* _____
1 Organization Name	
2 Country/Region that the Organization Represents	
3 Mailing Address	
4 **Organization Contact to IUPAC** *Will be published if application is approved*	(including address, e-mail and phone)
5 **Name of the person submitting this form** *if not the Responsible Person*	(including address, e-mail and phone)

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

Advancing Chemistry Worldwide

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Dr. Lynn M. Soby
Executive Director

1 July 2015

Subject: IUPAC National Adhering Organization Readmission Policy
(Approved by Executive Committee 30 June 2015)

National Adhering Organization Readmission Policy

1. Payment of all National Subscriptions in arrears is a prerequisite for consideration for readmission for a Member who has ceased to be a member because it is in arrears on its National Subscription for twenty-four months from the due date. A detailed plan for assuring the Member has the capability and processes in place to remit payment by December 31 of the year invoiced for any future payments is also required to be provided by the organization to the Union.

2. Re-application does not need to include full information as per the application form for new NAO members because the Union already has that information from the organization's earlier application for Membership. However, any substantive changes to that information should be noted on the re-application. Updated contact information for billing and other financially related issues would be necessary.

3. If the organization pays the National Subscription for the year in which its membership is ratified in Council, it may vote at that Council meeting on all items after the ratification of membership.

4. Payments by Members for National Subscriptions will be applied to the earliest outstanding unpaid invoice. IUPAC will provide a receipt to indicate the payment details to the Member. Note that IUPAC statute (S9.2) also regards partial payment of National subscriptions as nonpayment.

5. The organization becomes an NAO on 1 January of the year following the Council ratification.

6. The organization may not nominate candidates for positions of Officer, or Elected Member of Bureau, or Members of Divisions or Standing Committees, until it officially becomes an NAO.

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

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Statute 9.2 Reference

Statute 9.2: Any Adhering Organization in arrears with its subscription for a period of twelve months from the due date (S9.1 says the due date is January 1, payable before December 31 in each year) shall be warned, shall be deprived of its voting rights, and all publications of the Union shall be withheld from it. Any Adhering Organization in arrears for a period of twenty-four months from the due date shall automatically cease to be a Member of the Union. Partial payment of the subscription shall be regarded as non-payment, unless the Union exceptionally waives the outstanding subscription. Membership of bodies of the Union of all persons belonging to an Adhering Organization, which ceases to be a member, shall continue at the discretion of the Bureau to the end of the period of service.

Dr. Lynn M. Soby

Executive Director, IUPAC

Adoption of Recommendations on Nomenclature and Symbols

Recommendations:

A. D. Jenkins, R. G. Jones and G. Moad, *Terminology for reversible-deactivation radical polymerization previously called "controlled" radical or "living" radical polymerization (IUPAC Recommendation 2010)*, Volume 82, Issue 2, p. 483.

M. Nordberg, J. H. Duffus and D. M. Templeton, *Explanatory dictionary of key terms in toxicology: Part II. (IUPAC Recommendation 2010)*, Volume 82, Issue 3, p. 679.

K. Tatsumi and J. Corish, *Name and symbol of the element with atomic number 112 (IUPAC Recommendation 2010)*, Volume 82, Issue 3, p.753.

S. E. Braslavsky, A. M. Braun, A. E. Cassano, A. V. Emeline, M. I. Litter, L. Palmisano, V. N. Parmon and N. Serpone, *Glossary of terms used in photocatalysis and radiation catalysis (IUPAC Recommendation 2010)*, Volume 83, Issue 4, p. 931.

J. Proudfoot, O. Nosjean, J. Blanchard, J. Wang, D. Besson, D. Crankshaw, G. Gauglitz, R. Hertzberg, C. Homon, L. Llewellyn, R. Neubig, L. Walker and P. Villa, *Glossary of terms used in biomolecular screening (IUPAC Recommendation 2010)*, Volume 83, Issue 5, p. 1129.

N. E. Holden, M. L. Bonardi, P. De Bièvre, P. R. Renne and I. M. Villa, *IUPAC-IUGS common definition and convention on the use of the year as a derived unit of time (IUPAC Recommendation 2010)*, Volume 83, Issue 5, p. 1159.

Technical Reports:

P. Day, L. V. Interrante and A. R. West, *Toward defining materials chemistry (IUPAC Technical Report 2009)*, Volume 81, Issue 9, p. 1707.

M. E. Wieser and M. Berglund, *Atomic weights of the elements 2007 (IUPAC Technical Report 2009)*, Volume 81, Issue 11, 2131.

K. J. Powell, P. L. Brown, R. H. Byrne, T. Gajda, G. Hefter, A.-K. Leuz, S. Sjöberg and H. Wanner, *Chemical speciation of environmentally significant metals with inorganic ligands. Part 3: The Pb^{2+} + OH^-, Cl^-, CO_3^{2-}, SO_4^{2-}, and PO_4^{3-} systems (IUPAC Technical Report 2009)*, Volume 81, Issue (12), p. 2425.

R. Lobinski, J. S. Becker, H. Haraguchi and B. Sarkar, *Metallomics: Guidelines for terminology and critical evaluation of analytical chemistry approaches (IUPAC Technical Report 2010)*, Volume 82, Issue 2, p. 493.

H. R. Corti, C. A. Angell, T. Auffret, H. Levine, M. P. Buera, D. S. Reid, Y. H. Roos and L. Slade, *Empirical and theoretical models of equilibrium and non-equilibrium transition temperatures of supplemented phase diagrams in aqueous systems (IUPAC Technical Report 2010)*, Volume 82, Issue 5, p. 1065.

Adoption of Recommendations on Nomenclature and Symbols

I. Kuselman and A. Fajgelj, *IUPAC/CITAC Guide: Selection and use of proficiency testing schemes for a limited number of participants – chemical analytical laboratories (IUPAC Technical Report 2010)*, Volume 82, Issue 5, p. 1099.

H. Gamsjäger, J. W. Lorimer, M. Salomon, D. G. Shaw and R. P. T. Tomkins, *The IUPAC-NIST Solubility Data Series: A guide to preparation and use of compilations and evaluations (IUPAC Technical Report 2010)*, Volume 82, Issue 5, p. 1137.

J. Labuda, A. M. Oliveira Brett, G. Evtugyn, M. Fojta, M Mascini, M. Ozsoz, I. Palchetti, E. Paleček and J. Wang, *Electrochemical nucleic acid-based biosensors: Concepts, terms, and methodology (IUPAC Technical Report 2010)*, Volume 82, Issue 5, p. 1161.

W. A. Brand, S. S. Assonov and T. B. Coplen, *Correction for the ^{17}O interference in $\delta(^{13}C)$ measurements when analyzing CO_2 with stable isotope mass spectrometry (IUPAC Technical Report 2010)*, Volume 82, Issue 8, p. 1719.

U. Resch-Genger and P. C. De Rose, *Fluorescence standards: Classification, terminology, and recommendations on their selection, use, and production (IUPAC Technical Report 2010)*, Volume 82, Issue 12, p. 2315.

M. E. Wieser and T. B. Coplen, *Atomic weights of the elements 2009 (IUPAC Technical Report 2011)*, Volume 83, Issue 2, p. 359.

M. Berglund and M. E. Wieser, *Isotopic compositions of the elements 2009 (IUPAC Technical Report 2011)*, Volume 83, Issue 2, p. 397.

K. J. Powell, P. L. Brown, R. H. Byrne, T. Gajda, G. Hefter, A.-K. Leuz, S. Sjöberg and H. Wanner, *Chemical speciation of environmentally significant metals with inorganic ligands. Part 4: The Cd^{2+} + OH^-, Cl^-, CO_3^{2-}, SO_4^{2-}, and PO_4^{3-} systems (IUPAC Technical Report 2011)*, Volume 83, Issue 5, p. 1163.

A. D'Ulivo, J. Dědina, Z. Mester, R. E. Sturgeon, Q. Wang and B. Welz, *Mechanisms of chemical generation of volatile hydrides for trace element determination (IUPAC Technical Report 2011)*, Volume 83, Issue 6, p. 1283.

D. Kalderis, A. L. Juhasz, R. Boopathy and S. Comfort, *Soils contaminated with explosives: Environmental fate and evaluation of state-of-the-art remediation processes (IUPAC Technical Report 2011)*, Volume 83, Issue 7, p. 1407.

R. C. Barber, P. J. Karol, H. Nakahara, E. Vardaci and E. W. Vogt, *Discovery of the elements with atomic numbers greater than or equal to 113 (IUPAC Technical Report 2011)*, Volume 83, Issue 7, p. 1485.

DIVISION OF PHYSICAL AND BIOPHYSICAL CHEMISTRY

Report to the 48th IUPAC Council
for the 2014-2015 biennium
Busan, 12-13 August, 2015

Professor R. Marquardt
President

1st July, 2015

Contents

I. Highlights of divisional activities in the biennium 2014-2015

The 2014 off year-meeting was held in Kloster Kappel am Albis, Switzerland, between May 31 and June 1, 2014. As in the 2012 off-year meeting, the business part was predecessed by a scientific day, when committee members were given the opportunity to explain their work in short oral presentations. This genuinely scientific part of the meeting has again proven very useful, as it helps to bring members closer one to the other by the mutual discovery of the colleagues' scientific work, thus making the common work for the Union easier to accomplish.

The Division has participated in the project referring to a critical assessment of opinions within and outside the Union about the proposed new definition of the mole, the SI unit of amount of substance, and other units or physical quantities (Project No. 2013-048-1-100, see below).

Four new Division I projects were started. Two new interdivisional projects combining Divisions V, II and I, as well as one project having substantial funding from outside the Union were partially supported by Division I One conference obtained subventions from Division I.

II. Division I activities

The objectives of the Physical and Biophysical Chemistry Division have not changed since the last report. They are stated on the Division web page.

The main goal of the Physical and Biophysical Chemistry Division is to organize and promote the international collaboration between scientists in physical and biophysical chemistry and related fields. In particular, collaborations are encouraged that address

problems and formulate recommendations on nomenclature, symbols, units and terminology, as well as conventions in physical and biophysical chemistry.

To this end, projects are supported that:

foster the dissemination of the recommendations, the monitoring of their translations and their acceptance by the chemical community, herewith contributing to *IUPAC Goal No. 1* and *4*;

establish and stimulate the use of methodologies, standards and reference materials in physical and biophysical chemistry, herewith contributing to *IUPAC Goal No. 2*;

encourage the compilation and documentation of critically evaluated physicochemical data; recognize new developments in physical and biophysical chemistry and their fields of applications; and promote future oriented activities important for the contribution of physical and biophysical chemistry to science and technology and to the needs of the world-community, herewith contributing to *IUPAC Goal No. 3*.

With the organization of a world wide student cartoon competition, and the preparation of an abridged student version of one of its flagship document, the Green Book, Division I contributes to the enhancement of chemistry education, the career development of young chemical scientists, and the public appreciation of chemistry (*IUPAC Goal No. 5*).

Both via the careful composition of the Division Committee and the different project task groups running under the auspices of Division I, a maximum feasible diversity in membership in terms of geography, gender, and age is approached (*IUPAC Goal No. 6*).

The composition of the Division Committee given below is designed to cover all major areas of physical and biophysical chemistry and to enable identification of topics in which the Division can make new contributions.

The Subcommittee on Symbols, Terminology and Units listed below is essentially responsible for the Green Book and its revisions.

The Division is supported by an Advisory Subcommittee of currently 47 members, whose role is to advise on project proposals and evaluations. It is formed of former Division members and is periodically renewed.

The Division Committee periodically corresponds with its members giving notice of annual meetings, distributing news items about divisional activities, and encouraging participation.

The composition of the Committee for the biennium 2014-2015 was the following, at the beginning of the biennium:

President: R. Marquardt (France)
Vice-President: A. K. Wilson (USA)
Secretary: A. Friedler (Israel)
Past President: K. Yamanouchi (Japan)
Chair of Subcommittee on Symbols, Terminology and Units: J. Stohner (Switzerland)
Titular Members: K. Bartik (Belgium), A.R. Goodwin (USA,†), A. E. Russell (UK), J. Stohner (Switzerland), Y. H. Taufiq-Yap (Malaysia), F. van Veggel (Canada)
Associate Members: A. Császár (Hungary), V.Yu. Kukushkin (Russia),

A. W. Mombrú Rodriguez (Uruguay), X. S. Zhao (China), K. Bhattacharyya (India), J. L. B. M. de Faria (Portugal)
National Representatives: J. Cejka (Czeck Republic), S. Hannongbua (Thailand), M. Koper (Netherlands), J. E. G. Mdoe (Tanzania), V. Tomišić(Croatia), A. bin Hasan Susan (Bangladesh), S.-J. Kim (Korea), E. Klein (Bulgaria), M. Korenko (Slovakia), K. E. Laasonen (Finland); H. Corti (Argentina, as provisional member).

The picture below shows some Committee members with companies during the 2014 off-year meeting in Kappel am Albis, Switzerland. Prof. Andrea Russell was excused. To our greatest sadness, Dr. Anthony Goodwin, who was still with us on this photo, passed away on December 13, 2014. He has not been replaced to date.

The composition of the Commission on Physicochemical Symbols, Terminology, and Units is as follows:

Chair: J. Stohner (Switzerland)
Secretary: R. Hinde (USA)
Titular Members: A. Goodwin (USA), Y. Kuroda (Japan), A. J. McQuillan (New Zealand)
National Representatives: M.Choudhary (Pakistan), J. G. Frey (UK), Y. K. Ha (Korea), A. A. Milchev (Bulgaria), F. Pavese (Italy), M. Quack (Switzerland), D. Schomburg (Germany), S. Smith (Australia)

A replacement for Dr. Goodwin is pending.

The main points addressed in the 2014 off year meeting were the project progress reports, the discussion of future projects and future strategy of the Division. The topics addressed in the previous report as possible project areas of strategic interest for the future have been incorporated into the program of projects to be privileged by the Division. To be highlighted in particular are topics related data standardization between theory and experiments (see the projects on kinetic data for atmospheric chemistry, 2013-035-1-100, and at high temperatures, 2014-028-2-100, mentioned below) and topics related to material sciences, e.g. the project on crystal energy (2012-044-16100). To be mentioned is also the participation of the Division in project 2014-021-2-200. Other fields outlined at the beginning of the biennium, such as biophysical topics, shale gas fracture, the concept of absorption and emission line intensity, and density functional theory still need to be filled with upcoming projects. Other results ensuing the off-year meeting will be addressed below in the chapter "Specific Information".

Elections of Titular Committee Members (TM) for the next biennium 2016-2017 were held successfully in June, resulting in four new TM elected, whose election has to be validated by the Council. The nomination commission, chaired by the divisional past-president Prof. Kaoru Yamanouchi, set up an equilibrated list of candidates. However, geographical and in particular gender diversity could not be fully satisfied by the results of the ballot,which is to some extent compensated by the proposed new composition of Division officers for the next biennium: Prof. Angela Wilson will become divisional president, Prof. Kristin Bartik will become vice president; Prof. Assaf Friedler will remain divisional secretary and Prof. Roberto Marquardt will become past-president. These names were suggested and approved at the 2014 off year meeting.

III. Specific information

The following topics have receive particular attention during the discussions of the present biennium:

(1) Some old projects are still running with no cost extensions granted by the Division. The Division Committee is keeping contact with the respective project chair to encourage completion of their project. As mentioned in the 2014 report to the Bureau, the Division Committee has been continuously expressing concern about the longevity of some of the projects. A number of projects that were not completed have been terminated, and marked as such, while projects that were successfully completed were noted as completed. For projects that were terminated, the Division discourages further awards to the project leader, not only by Division I, but by other IUPAC Divisions as well. Freezes on the funding of projects for which there has been funding have been encouraged. Also, the possibility of limiting the amount of time funds are available for a project has been considered. All these measures will be maintained in the near future.

(2) Since January 2014 De Gruyter has been the new publishing company of Pure and Applied Chemistry (PAC). Members from one divisional task group issued serious complaints about continuous bad experiences during recent publication processes. Record is made here of one major issue referring to problems of following IUPAC rules about symbols: (cit) "the manuscript was not only delayed by the request to correct the appearance of symbols in a few cases but in many more cases the proofs were simply incorrect and did not follow the rules of scientific writing." It is a request of this Division that all must be done to ensure the correct reproduction of symbols in printed text that follow strictly the recommendations of the Union.

(3) On some of the book publishing projects, concern was noted by the Division Committee about the need for IUPAC funds, particularly since royalties are garnered

for commercial projects. IUPAC is encouraged to collect royalties on IUPAC-supported projects, and to put some guidelines in place for accomplishing this.

(4) The Gold Book, and in particular its online version, is still a world wide used tool to access IUPAC recommendations. It was noted that that recommendations published quite some time ago by the Division have not been included in the Gold Book (e.g. the recommendations on the hydrogen or on the halogen bond). The need for a new, "Gold Book Commission" was reiterated. That commission should not only be monitoring carefully updates of the Gold Book, it should also work out a clear concept of how it should look like in the future. People are becoming less aware of the Gold Book and they rather go for Wikipedia. We should make the Gold Book the official definition and have Wikipedia etc. refer to this. It should be the first entry in google when searching.

(5) The Subcommittee Commission I.1 of Division I has increasingly been requested to collaborate stringently in decision taking processes of the Interdivisional Committee on Terminology, Nomenclature and Symbols regarding IUPAC adopted terminology, nomenclature and symbols. Also the work of the Subcommittee has been said to be insufficiently reactive to demands for modifications of the Green Book, mainly from other bodies within IUPAC. In the present, project related working principle of IUPAC bodies, it is difficult to reply to these requests. This issue is evoked further below in the specific chapter referring to activities of the Subcommittee.

IV. Project details and publications

After the 95th Bureau Meeting held in Coimbra last year, the following 4 projects were approved and funded.

Project No. 2014-010-1-100: Transport Properties (Wakeham), full sponsored by Division I. During the production of Experimental Thermodynamics Volume IX, entitled Transport Properties of Fluids: Advances in Transport Properties (project 2013-003-3-100 mentioned below), it became apparent that Chapter 2.15 of the Green Book requires expansion to include the definitions of a number of different diffusion coefficients as well as to remove ambiguity that has appeared in the publication of articles including Experimental Thermodynamics Vol. III, Measurement of Transport Properties of fluids. An IUPAC Recommendation will be produced defining transport properties and the preferred symbols and SI units for incorporation in a revision of the Green Book. The Recommendation will be provided to the Physical and Biophysical Division, the Committee concerned with physicochemical Symbols, Terminology and Units and to ICTNS. Interested stakeholders would include physical scientists, biological scientists and engineers.

Project No. 2014-021-2-200: Topology Representation in Crystalline Materials (Öhrströhm), partially funded by Division I. The objectives of this project, which is lead by Division II, are: (1) To produce guidelines for terms to use in the topological description of metal-organic frameworks, coordination polymers and other crystalline materials that can be described as network compounds. (2) To produce guidelines for the use of topological descriptions in the mentioned areas. (3) To ensure permanent and stable access to the database containing topological nets and net descriptors. (4) To determine the procedure for depositing new network topologies. (5) To elaborate recommendations for including the information about network descriptors and topological properties into crystallographic databases. This project will be a collaboration with the IUCr and it will resolve outstanding issues identified in project 2009-012-2-200: "Coordination polymers and metal organic frameworks: terminology and nomenclature guidelines" as reported in Pure Appl. Chem., 85, 1715–1724, 2013.

Project No. 2014-028-2-100: Elementary Chemical Kinetics at High Temperatures (Turanyi), full sponsored by Division I. High temperature gas-phase reactions are of significant academic and practical importance in many fields including combustion, pyrolysis and process engineering. The group headed by Prof. Baulch regularly issued reports on the evaluated rate parameters of such reactions. Unfortunately this group stopped its activity. The activity of the new group will include (i) evaluation of the rate parameters of the elementary reactions related to basic fuels and also new fuel species like oxygenates; (ii) assessment of the uncertainty limits of the rate parameters; (iii) dissemination of the results using Web techniques. the intended stakeholders of the planned data evaluation work include: (i) experimental and theoretical scientists working in gas phase chemical kinetics; (ii) combustion engineers; (iii) chemical engineers modeling industrial problems; (iv) industrial safety specialists. The results will be published in J. Phys. Chem. Ref. Data

Project No. 2015-006-1-100: Energy Storage (Letcher), partially funded by Division I, the largest portion is sponsored by the University of Kwazulu, South-Africa. The collection of 26 chapters of this book project, written by international experts in their field, presents the latest developments in this fast moving field. Most of the energy storing processes currently being researched or being developed commercially are discussed in this one volume and will give the reader the opportunity of comparing the different processes and making it possible to decide which process is best suited for their situation, be it in a country blessed with abundant sunshine, wind, tides, rivers or mountain reservoirs. The technologies discussed in the book include both grid and off-grid energy storage.

Other current projects are:

Project No. 2012-040-1-100: Reference Correlations for the Thermal Conductivity and Viscosity of Fluids over Extended Range of Conditions (vapor, liquid and supercritical region) (Perkins). The aim of the project is to develop reference correlations for the thermal conductivity and the viscosity of fluids over extended temperature and pressure ranges including vapor, liquid and supercritical region. This project is close to completion.

Project No. 2012-044-1: Basic Terminology of Crystal Engineering (Metrangolo/Resnati).
The objectives of this project are (1) to produce guidelines for terminology (glossary of terms) in the area of crystal engineering, (2) to ensure that these guidelines are accepted by a large group of leading researchers in the field, and (3) to have these guidelines implemented or referred to in the instructions to authors of leading crystal engineering journals.

Project No. 2012-051-1-100: International Standard for Viscosity at Temperatures up to 473 K (Goodwin, who was replaced by his colleague Prof. J. Fernandez). There is a need for commercially available certified viscosity reference liquids for which viscosity and density is known over a range of temperatures and pressures. In this project a viscosity standard will be determined experimentally and from statistical analyses of samples collected in different locations in Europe and in the US. The outcome of the project will contribute to improve the quality of communications and data exchange related to viscosity measurements.

Project No. 2013-048-1-100: A critical review of the proposed definitions of fundamental chemical quantities and their impact on chemical communities (Stohner). This project aims primarily at providing a technical report containing a critical review of proposed new definitions of the physical quantity amount of substance, and its unit, mole, as well as of its related unit for the quantity mass. This report should strengthen IUPAC's position in the ongoing discussion about the new definition of the aforementioned units. It is an interdisciplinary project supported conjointly by Divisions I, II and V, as well as by the Committee on Chemical Education and ICTNS.

Project No. 2013-035-1-100: Evaluated kinetic data for atmospheric chemistry (Wallington). This project is a continuation of a successful series of projects on kinetic data for atmospheric chemistry, carried out by essentially the same task group. The outcome will be a review of new data published in 2013/2014 and a compilation of recommended data for ≥C4 organic and aromatic compounds of atmospheric interest, important for chemistry-climate models in Earth system analyses for global and regional applications. Work from the previous project received a highlighting science feature article in issue 51 (February 2014) of the International Global Atmospheric Chemistry (IGAC) Newsletter.

Projects that have been concluded since the last report are

Project No. 2011-022-2-100: High Resolution Spectroscopy Database for Water Isotopologues (Tennyson). The database and explanatory recommendations were published IUPAC Technical Reports in PAC in 2014 (Tennyson *et al.*, Pure and Applied Chemistry 86, issue 1, 71-83; *ibid.* issue 12, 1931-1943). Members of this task group have reported on bad experiences with the publication of articles in PAC with the new Publisher De Gruyter. Because of its importance, this item is given special attention at the end of this report.

Project No. 2012-041-1-100: Future Energy Revisited (Letcher). This is a book publishing project: Volumes Properties: Liquids, Solutions and Vapours, eds. E. Wilhelm and T. M. Letcher, Royal Society of Chemistry, Cambridge, UK, 2014, 22 chapters, ISBN: 978-1-849738996. Publication date: 25 November 2014.

Project No. 2013-003-3-100: Experimental Thermodynamics Volume IX: B, Non-Equilibrium Thermodynamics and Applications (Wakeham). This is a book project, and the book is up to be published by the Royal Society of Chemistry in 2015.

V. Activities of Commission I.1

The core activity of the Subcommittee “Commission on Physicochemical Symbols, Terminology, and Units (Commission I.1)”, is the publication and updating of the book “Quantities, Units and Symbols in Physical Chemistry” (the Green Book). Its 3rd edition was published in 2007 by R. Cohen, T. Cvitas, J.G. Frey, B. Holmström, K. Kuchitsu, R. Marquardt, I. Mills, F. Pavese, M. Quack, J. Stohner, H.L. Strauss, M. Takami, and A.J Thor.

The last printing (third printing) was prepared by the Royal Society of Chemistry (RSC) Publishing in 2011 and is already sold out. For the 4th printing, one part of the task group will meet in July 2015, and the Commission will gather at the General Assembly in Busan to finish the preparation of the text to be sent to the publisher for the 4th printing..

The Green Book is being translated into several languages. The Japanese and French translation of the 3rd edition have been published recently. There is a Spanish translation of the 2nd edition. A Turkish and Portuguese translation are in preparation. The Italian translation is finished, but a suitable publishing company has not yet been identified.

The abridged version of the Green Book is technically finished. The missing piece of work is related to the lay out. The print-ready manuscript is expected to be sent to the publisher in 2015.

In addition to its core activity, the Subcommittee has been continuously more requested to collaborate stringently in decision taking processes of the Interdivisional Committee on Terminology, Nomenclature and Symbols regarding IUPAC adopted terminology, nomenclature and symbols, as these are potentially used by economic and political authorities worldwide. Fact is that this Subcommittee has tacitly stopped to meet in its full composition after the General Assembly in Brisbane, in 2001. Meetings have been crucial for the progress of the Subcommittee's work in the past and the lack of meetings is hampering the progress of the work. Unlike the preparation of a specific Recommendation, or Technical Report, the contents of the Green Book involve many facets of physical chemistry. Despite this fact, demands for modifications have continuously been incorporated, i.e. during the several printings of the 3rd edition. However, not all demands can be treated without throughout discussion among Subcommittee members and exchange with groups of experts. For this purpose, regular meetings seem to be essential. In the present, project related working principle of IUPAC bodies, there is hardly space for such meetings. If more reactivity or additional tasks are expected from this Subcommittee, it should receive in some way recurrent financial means for meetings. A very similar conclusion has to be drawn regarding the publication of the Gold Book (see above).

INORGANIC CHEMISTRY DIVISION (II)
Report to the 48th GA Council, Busan,– August 2015

Members (2014-2015)

President: J. Reedijk (The Netherlands)
Past President : R. D. Loss (Australia)
Vice President: L. Öhrström (Sweden),
Secretary: M. Leskela (Finland),
Titular Members: T. Ding (China), M. Drabik (Slovakia), D. Rabinovich (USA), E. Tshuva (Israel), T. Walczyk (Singapore), M. Wieser (Canada)
Associate Members: J. Buchweishaija (Tanzania), P. Karen (Norway), J. Garcia Martinez (Spain), A. Kiliç (Turkey), K. Sakai (Japan), R-N. Vannier (France),
National Representatives: Y. Abdul Aziz (Malaysia), A. Badsha (Pakistan), L. Armelado (Italy), V Chandrasekhar (India), L. Galamba-Correia (Portugal), S. Kalmyakov (Russia), B. Prugovečki, Biserka (Croatia), N. Trendafilova (Bulgaria), L. Meesuk (Thailand). S. Mathur (Germany),

Division and Interdivision (sub)committees:
* Commission on Isotopic Abundances and Atomic Weights (II.1), Chairman: J. Meija
* Subcommittee on Isotopic Abundance Measurements, Chairperson: J. Irrgeher
* Subcommittee on Stable Isotope Reference Material Assessment, Chairman W. Brand
* Subcommittee on Natural Assessment of Fundamental Understanding of Isotopes: Chairperson: N. Holden
* Interdivisional Subcommittee on Materials Chemistry, Chairman: C. Ober,

I. Divisional Highlights

The Division is currently directly involved with over 20 ongoing projects, part of these jointly with other Divisions. A number of projects were completed during the last two years, and some of these are highlighted below.

The first of these is the project **Coordination polymers and metal organic frameworks: terminology and nomenclature guidelines.** Published as: IUPAC Recommendations 2013 Batten, Stuart R. et al., "Terminology of metal-organic frameworks and coordination polymers) Authors: in Pure and Applied Chemistry (2013) **85**, 1715-1724. As per July 1, 2015, this report has been cited already 65 times (22 times in period January-June 2015). A prepublication in CrystEngComm in 2012, inviting comments and suggestions, was already cited over 100 times.

The **Oxidation State Project** 2008-040-1-200, "Towards a comprehensive definition of oxidation state" has accomplished its first major goal by publishing in 2014 a IUPAC Technical Report on the subject: Pavel Karen, Patrick McArdle and Josef Takats, Pure and Applied Chemistry (2014), **86**, 1017–1081; (see: http://dx.doi.org/10.1515/pac-2013-0505). The Report introduces several novel approaches to oxidation state. Instead of definitory algorithm, there is one single generic definition based on ionic approximation of heteroatomic bonds. For the latter, the team has tested three alternative interpretations: bond polarity, average valence-orbital energy of the isolated atom, and the atom's contribution to the bonding MO. The Report provides a clear set of rules for determination of oxidation state, illustrated with numerous examples. It has been implemented in the Wikipedia page on Oxidation State. The Project, currently valid to Dec. 31, 2015, has three more planned tasks on its agenda: 1) Discussion and finalizing the IUPAC Recommendation on the topic (a first draft is ready), 2) Suggestion how to modify the Gold-Book entries for Oxidation Number and Oxidation State (details of the wording are currently being

discussed at the task group), 3) a paper on oxidation state in teaching for Journal of Chemical Education (in discussion prior drafting). To generate further responses and prepare for the three focused write-ups, the project convener Pavel Karen published an Essay entitled "Oxidation State, A Long-Standing Issue" Angew. Chem. Int. Ed. . 2015, 54, 4716 – 4726 (see: http://dx.doi.org/10.1002/anie.201407561)

A joint IUPAC/IUPAP Working Party continues to consider **claims for new elements with atomic numbers in the range 113 to 118** - see IUPAC project 2012-047-1-200. This project is expected to lead to clarification for claims to elements numbered 113, 115, 117 and 118. The joint IUPAC – IUPAP Joint Working Party was expected to report on its deliberations by the end of 2013, but this did not take place and we are now expecting the report by the end of 2015. The Division would like to acknowledge to contribution of IUPAC Treasurer, Prof John Corish, for his assistance with this important work. Even though these new elements have little current applicability, the approval of the naming of new elements is a high visibility activity for IUPAC that attracts significant public attention to the Periodic Table of the Elements and in general for IUPAC.

Revised Atomic Weights Project 2011-027-1-200, “Evaluated Published Isotope Ratio Data (2011-2013)” The most recent biennial review of atomic-weight determinations and other cognate data by the Commission on Isotopic Abundances and Atomic Weights (CIAAW) has resulted in changes for the standard atomic weights of cadmium, molybdenum, selenium, and thorium based on recent determinations of terrestrial isotopic abundances. In addition, the standard atomic weights of 15 elements have been revised based on the new assessment of their atomic masses by International Union of Pure and Applied Physics. The IUPAC Press Release of 24 Sep 2013 resulted in a significant amount of media enquiries and resulted in wide spread of articles in the global media, including the Huffington Post, Telegraph, Yahoo! News, Chemical and Engineering News and Popular Science, to name a few. Work continues in this area in collaboration with the International Bureau of Weights and Measures (BIPM) in projects related to explaining the significance of, and how to work with these atomic weight intervals to the wider chemical community.

Finally, it is with pleasure to note that among the 10 most downloaded articles from PAC (as per end of 2014) several of them have an origin in our division. To be mentioned are:
#1. Assessment of international reference materials for isotope-ratio analysis (IUPAC Technical Report) by W.A. Brand et al.
#4. Atomic weights of the elements 2011 (IUPAC Technical Report) by M.E. Wieser et al.
#5. Toward a comprehensive definition of oxidation state (IUPAC Technical Report) by Pavel; Karen et al.
#8. Terminology of metal–organic frameworks and coordination polymers (IUPAC recommendations 2013) by S.R. Batten et al.

II. Operations of the Division: seen from the perspective of the 6 IUPAC long-range term goals

1. IUPAC will provide leadership as a worldwide scientific organization that objectively addresses global issues involving the chemical sciences.

The Division’s operations are in the areas of Inorganic Chemistry covering the broad areas of Atoms, Molecules and Materials with the former being effectively subsets of the latter. “Atoms” covers areas such as the name giving process of new elements, and atomic weights and isotopes of the elements. Molecules cover that broad area of inorganic chemistry between atoms and materials chemistry, while Materials Chemistry deals with any inorganic material. In practice the boundary between organic and inorganic materials

can be difficult to determine, and therefore the existence of the interdivisional Subcommittee on Materials chemistry, which includes members of both Division II and Division V (Polymers) can be understood. All three areas do address global chemical community needs, as will also be clear from the following sections.

2. *IUPAC will facilitate the advancement of research in the chemical sciences through the tools that it provides for international standardization and scientific discussion.*

   The Division supports fundamental data evaluation projects that are vital to long term research in the chemical and other sciences. An ongoing major effort in this regard is the work done on Atomic Weights and increasingly also on Isotopic Abundances, both of which comprise fundamental data used by the entire chemical community. These data are also critical in international commerce and trade of chemicals and chemical products. Projects 2009-027-1-200 and 2013-032-1-200 are examples of successful IUPAC efforts towards international standardization of chemical measurements in this area. Project 2009-027-1-200 has been set out to establish a list of primary international standards in isotope ratio measurements. The resulting IUPAC Technical Report remains the most downloaded article from *Pure and Applied Chemistry* and its recommendations were officially endorsed by the International Committee of Weights and Measures in March 2015. The Division believes that IUPAC plays an important role in this ever-increasing need from the chemical community. The danger of this not being taken up by an international organization like IUPAC, is a burgeoning number of in-house standards for isotope ratio measurements that - as well as creating additional expense for the chemical community - also reduces standardization and unnecessarily complicates communication and chemical understanding.
   Uncertainty of measurements plays an important role in the way chemists interpret and disseminate their results. Evaluation of uncertainty is a complex task and international guidelines such as the “Guide to the Expression of Uncertainty in Measurement”, which is co-authored by IUPAC, go a long way to ensure uniform scientific discussion. Although atomic weights form the basis for nearly all chemical measurements, the atomic weight uncertainties still lack uniform interpretation. Project 2013-032-1-200 is an example of international collaboration between IUPAC and the Joint Committee for Guides in Metrology to establish a set of coherent guidelines on formal interpretation of standard atomic weight uncertainties.

3. *IUPAC will assist chemistry-related industry in its contribution to sustainable development, wealth creation, and improvement in the quality of life.*

   The same fundamental data that the Division provides for international standardization is also used by commerce and industry. The most significant examples of this are the above-mentioned latest atomic weights and isotope abundances. Isotopic abundances, which are becoming increasingly important in areas, in particular for legal and provenance cases and also in medicinal chemistry.

4. *IUPAC will foster communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing countries.*

   The Division reviews relevant IUPAC sponsored international conferences on the chemical sciences. Through the IUPAC project system the Division strongly supports the inclusion of

chemists from as wide a range of countries as possible on project task groups. The Division also publishes a biannual newsletter of its activities, which are also distributed to all member country societies and are readily available on the IUPAC website. For the most recent one, see:
http://www.iupac.org/fileadmin/user_upload/divisions/II/Div_II_newsletter2014_1.pdf

5. *IUPAC will utilize its global perspective and network to contribute to the enhancement of chemistry education, the career development of young chemical scientists, and the public appreciation of chemistry.*

The Division has reported earlier on a project with CCE on the extension of a major project involving the Period Table of the Isotopes for the educational community. (Project number 2007-038-3-200) This project was very successful, and explored also ways to present this critical chemical representation of real world chemistry and the resulting wealth of applications it provides to many areas of chemistry. A follow-up project, i.e. 2014-024-1-200 is to result in the creation an interactive, electronic version of the IUPAC Periodic Table of the Isotopes. In 2013, Division's Commission on Isotopic Abundances and Atomic Weights launched a redesigned website (see: http://ciaaw.org) featuring a wealth of information of its products and activities. This site functions as the authoritative online platform for the Commission's products. During the first three months of 2015, this website has been accessed from over 100 countries worldwide.
Wikipedia: On the suggestion of profs. Weiser and Öhrström all division members have been stimulated to read and also edit relevant pages in Wikipedia, in English or other languages. Currently entries such as the following may be interesting to refer to:
https://en.wikipedia.org/wiki/IUPAC
https://en.wikipedia.org/wiki/IUPAC_Inorganic_Chemistry_Division
https://en.wikipedia.org/wiki/Commission_on_Isotopic_Abundances_and_Atomic_Weights

6. *IUPAC will broaden its national membership base and will seek the maximum feasible diversity in membership of IUPAC bodies in terms of geography, gender, and age.*

The Division actively pursues new members to participate in divisional elections based on merit and diversity, through existing membership and connections, young observer program, and through their national adhering organizations. Divisional projects are also reviewed for general diversity of the project task group.

3) State of Projects – as of July 1, 2015

The Division currently has 20 active projects (slightly up from 18 in 2014) on its project list.

In 2014 4 new projects have been funded, as visible by their project code numbers below.

Some newly proposed projects are in the pipeline and close to submission, such as a project on group III of the Periodic Table, a Periodic Table of Life, and project to showcase how to use Wikipedia to promote IUPAC activities and to inform about our division activities.

In addition there are a few Projects co-funded with other divisions, visible in red color marks, in the Table below.

List of Division-connected active projects as per July 1 2015

2008-040-1-200:	Towards a comprehensive definition of oxidation state
2009-023-1-200:	Evaluation of Radiogenic Abundance Variations in Selected Elements
2009-026-2-200:	Online evaluated isotope ratio database for user communities (2011-2014)
2009-027-1-200:	Assessment of Stable Isotopic Reference and Inter-Comparison Materials
2009-045-1-200:	Guidelines for Measurement of Luminescence Spectra and Quantum Yields of Inorganic Compounds, Metal Complexes and Materials
2009-046-2-200:	Terminology and definition of quantities related to the isotope distribution in elements with more than two stable isotopes
2011-026-1-200:	Full calibration of a new molybdenum isotopic reference material
2011-027-1-200:	Evaluated Published Isotope Ratio Data (2012-2013)
2011-028-1-200:	Evaluation of published lead isotopic data (1950 - 2013) for a new standard atomic weight of lead
2011-035-1-800:	Terminology and Nomenclature of Inorganic and Coordination Polymer
2011-040-2-200:	Developing a procedure for using intervals instead of fixed values for atomic weights
2012-036-2-200	Recommendations for Isotope Data in the Geosciences II
2012-044-1-100	Basic Terminology of Crystal Engineering
2012-045-1-800	Nomenclature for Polyhedral Boranes and Related Compounds
2012-046-2-800	Handling of Inorganic compounds for InChI V2
2012-047-1-200:	Discovery of Elements with Atomic Numbers greater than 113
2013-030-1-800	Nomenclature for Metallacycles containing Transition Metals
2013-032-1-200	Guidelines for the derivation of values and uncertainties from standard atomic weight intervals
2013-037-1-200	Creating an Educational Website for Materials Chemistry
2014-001-2-200	Terminology Guidelines and Database Issues for Topology Representations in Coordination Networks, Metal-Organic Frameworks and Other Crystalline Materials
2014-002-1-200	Assessment of Stable Isotopic Reference Materials [Follow-up to project 2009-027-1-200 (TGC: Willi Brand, CIAAW)].
2014-016-2-200	Compilation of the variation of the isotopic composition of the elements via crowd sourcing
2014-024-1-200	Development and Global Dissemination of an IUPAC Interactive Electronic Isotopic Periodic Table and Supporting Resources for the Education Community

4) Other Additional Information

Divisional Election of 2016-17 members

The Division is pleased to report the completion of its election for membership for the 2016-17 biennium. I would like to especially thank VP Öhrström and the nomination panel for pushing the elections through using the new, tight time schedule for these elections. The candidates elected need approval or Council.

General Divisional Operations

Since a few years within the Division we have a scheme available for each of the members and their duties within the division. The Division considers it of great importance that member have chances to become and remain active e.g. in projects. Therefore annual meetings of TMs, and if possible more members (AM. NR) have been and will be organized. The 2014 meeting, had a very good attendance (see below).

Interdivisional Subcommittee on Materials Chemistry

The Division has substantial representation on the Interdivisional Subcommittee on Materials Chemistry (Current chair is C. Ober, also PP of Polymer Division) which together with Divisions I and IV is exploring ways of expanding the significance of Materials Chemistry with IUPAC and increasing the interaction between IUPAC and the Materials Chemistry user communities. Several ideas for projects were developed including a new project on development of a Materials Chemistry Education Website, now: 2013-037-1-200.

Off year Meeting – National University of Singapore – July 2014

Singapore off-year meeting: The division's off-year meeting took place during 1½ day at National University of Singapore, kindly hosted and exemplary organised by Thomas Walczyk. Among notable items were a number of reports from IUPAC committees and affiliated organizations, discussions on sponsorship of conferences and the generation of new projects. The minutes have been distributed to the members.

6. Other Significant Issues relevant to mention

- The DP and VP served in an ad-hoc committee of the Bureau on a possible naming of the IUPAC Periodic Table : Mendeleev Periodic Table. In a brief report to the Executive Committee is was recommended not do this. Full text of the recommendation: The ad-hoc group presents the following 2 recommendations to IUPAC.
- *1.The ad hoc task group recommends to IUPAC not to accept the suggested change in naming of the IUPAC Periodic Table. Such a change would definitely not be in accordance with the spirit and formalities of the IUPAC strategic plan, statutes, bylaws and general practice in nomenclature and terminology creation.*
- *2.The task group, therefore also recommends not to develop criteria for any process that would be used to decide on priority, or naming of a chemical discovery, or an invention for either an individual or a group.*

- Division II members work closely with representatives from Division I and V towards the IUPAC Technical Project on the redefinition of the mole.
- A paper in Nature (Sato et al. Nature 520, 209-211;April 2015) and an accompanying commentary on the Ionisation Potential of Lawrencium has raised the question: would perhaps Lu and Lr better belong to the d block. On requests of Nature and Science the DP has responded that Div II will discuss the issue, and may invite project proposals on fine-tuning group-3 elements in the Periodic Table.

Report of Division III (Organic and Biomolecular)
IUPAC Bureau Meeting
Busan, Korea

Mary Garson

I. Executive Summary:

The mission of the Division of Organic and Biomolecular Chemistry is to oversee activity in the field of organic and biomolecular chemistry in the broadest sense. Division III consists of a Division Committee (comprising 10 Titular members, 6 Associate Members and 10 National Representatives) and 6 Subcommittees.

Major activities comprise conference organization and projects (both evaluation and involvement); a Divisional newsletter is produced at intervals. The Division oversees the awarding of two IUPAC prizes, the guidelines for one of which (the CHEMRAWN prize for Green and/or Atmospheric Chemistry) have been reviewed during 2015.

Highlights of the 2014-2015 biennium include the hosting of nine international conferences and the funding of four new projects, as detailed below.

II. Division Activities against IUPAC Strategic Goals

1. IUPAC will provide leadership as a worldwide scientific organization that objectively addresses global issues involving the chemical sciences.

The scientific interests of Division III cover organic chemistry in both fundamental and applied dimensions. At the heart of the Division lies the topic of organic synthesis, a keystone science, covering topics as diverse as new reactions and reagents, the asymmetric synthesis of natural products, molecular catalysts, and organometallic chemistry. In the biomolecular area, key topics include chemical biology, notably glycomics, linking across to the more applied topic of biotechnology. The Division has always had strong links into physical chemistry through spectroscopy and/or organic analysis. The discipline of green chemistry first emerged within Division III, and continues to connect the Division to other Divisions of IUPAC.

The main program of activities is conducted in two forms: firstly via a series of well-established international conferences, and secondly through the IUPAC project system. This Division coordinates these scientific topics through six sub committees as well as by involvement in interdivisional activities. The six sub committees are:

Sub committee on Organic Synthesis (2014-2015 Chair: Margaret Brimble, NZ)
Sub committee on Biomolecular Chemistry (2014-2015 Chair: Michael Blackburn, UK)
Sub committee on Green Chemistry (2014-2015 Chair: Pietro Tundo, Italy)
Sub committee on Photochemistry (2014-2015 Chair: Silvia Braslavsky, Germany)
Sub committee on Structural and Mechanistic Chemistry (2014-2015 Chair: vacant)
Sub committee on Biotechnology (2014-2015 Chair: Francesco Nicotra. Italy)

Four of these sub committees meet annually, either at the most relevant scientific conference or at the biannual General Assembly. The photochemistry subcommittee also meets annually at one

of their specialist conferences. The subcommittee on structural and mechanistic chemistry has been inactive in recent years, but maintains carriage of the ICPOC series of conferences (see below).

Project work is core business for the Division; many Divisional projects are linked to global issues involving the chemical sciences. To date, the Division has approved four project proposals during the 2014-2015 biennium (*An introduction to Computational Chemistry and in-silico visualization; a Workshop for sub-Saharan Africa scientists* (2015-016-2-300); *Nomenclature of Homodectic Cyclic Peptides Produced from Ribosomal Precursors* (2015-003-2-300); *Healthy Life and Active Ageing: the Contributions of Functional Food Ingredients* (2013-054-2-300; *Chemistry beyond Chlorine* (2013-057-3-300). Six projects approved during the 2012-2013 biennium remain current (carbohydrate nomenclature (2012-039-2-800), genochemistry (2009-021-3-300), nomenclature of phosphoryl transition states (2013-039-2-300), photoluminescence quantum yields (2013-040-1-300), green chemistry curricula in Latin America/Africa, (2013-041-3-300), glossary of renewable chemistry (2013-036-2-300)), two of which are joint with other Divisions (carbohydrate nomenclature- Div. VIII; photoluminescence quantum yields – Div. I), while three other projects (abbreviations for protecting groups (2011-044-1-300), SE Asian network for organic chemistry (2011-041-1-300), Mediterranean heterocyclic chemistry network (2011-006-2-300)) were approved at the 2011 General Assembly held in Puerto Rico and so are close to a conclusion. A full list of Division projects (2012-2015) is provided at the end of this report.

2. IUPAC will facilitate the advancement of research in the chemical sciences through the tools that it provides for international standardization and scientific discussion.

International standardization: The work of the sub committee photochemistry best exemplifies the contribution of Division III to tools for international standardization. Examples of projects coordinated by members of the group include: *Measurement of Photoluminescence Quantum Yields* (2013-040-1-300; Brouwer); *Standard Photochemical Processes* (2008-037-2-300; Griesbeck). Nomenclature projects are also important: recent examples include *Nomenclature of Homodectic Cyclic Peptides Produced from Ribosomal Precursors* (2015-003-2-300); *Nomenclature of Transition State Structures and their Analogs for Phosphoryl Transfer Reactions* (2013-039-2-300); *Rules for abbreviation of protecting groups* (2011-044-1-300).

During 2015, the Division reviewed past projects within the field of NMR spectroscopy, and convened email discussions with members of the NMR community and with representatives from Division I about the standardization of NMR data in scientific manuscripts, and the level of accuracy associated with the reporting of NMR data. Members of the NMR community belonging to Division III have diverse technical interests ranging from metabolomics, natural products and synthetic structure elucidation, through to NMR methods development, and consequently express a wide range of views on these issues. During the latter part of 2015, a project submission is envisaged, ideally in concert with interested members of Division I.

Scientific discussion: During the 2014-2015 biennium, the Division oversaw arrangements for nine international conference series, many of which are meetings of long-standing within the IUPAC conference calendar. These meetings were: 20th International Conference on Organic Synthesis (ICOS, June 2014, Hungary); XXVth IUPAC Symposium on Photochemistry (July 2014, France); 22nd International Conference on Physical Organic Chemistry (ICPOC, August 2014, Canada); 5th International Conference on Green Chemistry (ICGC, August 2014, South

Africa); 16th International Symposium on Biotechnology (IBS, September 2014, Brazil); 28th International Symposium on the Chemistry of Natural Products/8th International Conference on Biodiversity (ISCNP/ICOB October 2014, China); 10th International Conference on Biomolecular Chemistry (January 2015, India); 11th International Conference on Heteroatom Chemistry (ICHAC, June 2015, France); and the 18th International Symposium on Organometallic Chemistry directed towards Organic Synthesis (OMCOS, June 2015, Spain).

Future meetings in these conference series are envisaged as follows: 21th International Conference on Organic Synthesis (ICOS21, 11-16 December 2016, Mumbai, India); XXVIth IUPAC Symposium on Photochemistry (3-8 April 2016, Osaka, Japan); 23nd International Conference on Physical Organic Chemistry (ICPOC23, 1-8 July 2016, Sydney, Australia,); 6th International Conference on Green Chemistry (6ICGC, 4-9 September 2016, Venice, Italy); 17th International Symposium on Biotechnology (IBS17, 25-28 October 2016, Melbourne, Australia); 29th International Symposium on the Chemistry of Natural Products/9th International Conference on Biodiversity (ISCNP29/ICOB9, Turkey, September 2016); 11th International Conference on Biomolecular Chemistry (October 2017, Konstanz, Germany); dates and venues for the 12th International Conference on Heteroatom Chemistry and the 19th International Symposium on Organometallic Chemistry are under discussion.

3. IUPAC will assist chemistry-related industry in its contribution to sustainable development, wealth creation, and improvement in the quality of life.

The Sub committee of Green Chemistry Subcommittee has provided project activity connecting to the economical growth and activity of the chemical industry, particularly in developing countries. In other activities, Division III conferences, particularly the International Biotechnology symposia and the various Green Chemistry meetings, provide an opportunity to link industry-base chemists with those from universities and the government sector.

4. IUPAC will foster communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing countries.

The 5th International IUPAC Conference on Green Chemistry (5th ICGC) was held in in Durban (South Africa), 17-21 August 2014. It was co-hosted by the South African Chemical Institute (SACI), the University of Kwazulu-Natal (located in Durban) and the University of Venda (located in Thohoyandou). This was the first time that the ICGC came to the African continent, and so offered a great opportunity to facilitate interactions of African scientists with colleagues from all over the world and to promote green chemistry in Africa. The main objective of the conference was that of emphasizing the importance of green chemistry for sustainable development; it was a multidisciplinary event considering all the major areas of green chemistry. There were joint sessions with other IUPAC divisions or committees for selected themes (environmental chemistry, green chemistry education, and polymers). A session on sustainability and security, conducted by the Organisation for the Prohibition of Chemical Weapons (OPCW) emphasized the links between scientific knowledge, education and policies with regard to the production and use of chemicals.

A number of Division III projects are strongly linked to chemistry in developing countries. Recent examples include the following geographic areas **Africa**: a workshop in computational chemistry for sub-Saharan chemists (2015-016-2-300, Whitehead); biomass burning in sub-Saharan Africa (2007-025-1-300, Mammino); network for heterocyclic chemistry in North

Africa (2011-006-2-300, Florio); green chemistry in higher education (2013-041-3-300, Zuin); **Central/South America** green chemistry in higher education (2013-041-3-300, Zuin); glossary on renewable chemistry (2013-036-2-300, Vaz); **East and South East Asia**: network for organic chemistry (2011-041-1-300, Isobe).

Next, considering communication, a new initiative of the Istanbul General Assembly was the holding of inter-Divisional meetings. Division III participated in meetings with Division VI, in which joint interests in green chemistry were explored, as well as with Division VIII given the joint interests in various aspects of organic nomenclature. It is hoped that these meetings can continue at the General Assembly in Busan (2015).Finally, the Division produces occasional newsletters, the last being in November 2012. An abbreviated version of this newsletter was published in *Chemistry International* (2013, Sept./Oct., pp29-32). In this way, national representatives have been kept informed of Divisional activities.

5. IUPAC will utilize its global perspective and network to contribute to the enhancement of chemistry education, the career development of young chemical scientists, and the public appreciation of chemistry.

The Division oversees the awarding of two prizes to outstanding young chemists. The Thieme-IUPAC prize in Synthetic Organic Chemistry, which is generously supported by the scientific publisher Thieme, is awarded to a chemist under the age of 40 whose research has had a major impact on the field of synthetic organic chemistry. The 2014 prize was presented at ICOS20 (Hungary) to Professor Martin Burke (USA) for the synthesis and study of small molecules with protein-like functions. The CHEMRAWN VII Prize for Atmospheric and Green Chemistry is presented biannually to a chemist under the age of 40 and from a developing country for research in green and/or atmospheric chemistry. The 2014 prize was awarded at 5ICGC (South Africa) to Dr Vania Zuin (Brazil) in recognition of her significant contributions in developing green analytical methodologies used to analyze bioactive high-value organic substances extracted from agro-industrial residues.

Division conferences are traditionally well supported by younger chemists, and several activities within these meetings target this age group. The majority of these meetings provide poster prizes to student delegates, and some host workshops designed for young researchers to meet with plenary speakers. Details of Division conferences are provided elsewhere in this report.

In relation to the public appreciation of science, the year 2015 has been chosen by UNESCO as the Year of Light (including light technological applications). The photochemical community, and members of the Sub-Committee on Photochemistry, have contributed to this UNESCO-sponsored celebration.

A project funded in 2015 (*Healthy Life and Active Ageing: the Contributions of Functional Food Ingredients*, 2013-054-2-300, Rauter) seeks to bring chemistry to the general public, demonstrating through the implementation of an interactive website, how chemistry offers unique solutions for society needs in terms of a healthy living and a better ageing.

Other projects, notably those coordinated through the Sub-Committee on Green Chemistry, seek to engage young people; for example, project 2013-036-2-300 *Glossary on Renewable Chemistry* (led by Silvio Vaz) is developing content related to biomass chemistry and green chemistry, and is aimed at students as well as at researchers. An earlier project, 2013-041-3-300 *Green*

Chemistry in Higher Education: towards a Green Chemistry Curriculum for Latin American and African Universities (led by Vania Zuin) has considered the development of general modules for up-to-date university Green curricula within Chemistry courses (Bachelor and Teacher Training), and also has an emphasis on public awareness of green chemistry principles. Finally project 2013-057-3-300 *Chemistry beyond Chlorine* led by Pietro Tundo seeks to improve the perception of chemistry.

6. IUPAC will broaden its national membership base and will seek the maximum feasible diversity in membership of IUPAC bodies in terms of geography, gender, and age.

In terms of geographical representation in the 2014-2015 biennium, the Division III committees for 2014-2015 comprised representatives from Asia (1 x TM, 2 x AM, 4 x NR), Africa (1 x NR), the Middle East (1 x AM) in additional to the traditional bases of Europe and North America. The Division has lacked representation from Latin or South America, other than a Provisional Member from Mexico, and various members of project task groups.

In diversity matters, the Division has excellent representation with two female Titular Members serving as Division President and Division Vice President, respectively, two female Associate Members and two female National Representatives. Indeed women comprise 23% of the 2014-2015 Divisional committee. The age profile within the Division still requires attention, although it should be noted that National Representative Dr Oleg Demchuk (Poland) has previously been a Young Observer at Division III meetings. Dr Demchuk has been retained on the Division committee as an Associate Member for the 2016-2017 biennium.

The recent Division ballot has resulted in election of Prof Amelia Rauter (Portugal) as Division Secretary, and of Dr Janet Scott (UK) as a Titular Member, thereby increasing the number of women Titular Members to 4 out of the 10. Membership from the Latin and South American region is considered high priority ahead of the IUPAC meetings in Brazil in 2017, therefore Associate Members have been selected from Brazil and from Puerto Rico for the next biennium. In the 2016-2017 biennium, women will represent 27% of the Division committee.

III. Additional Information:

Finance: Historically, Division III has had considerable difficulty creating worthwhile projects, or allocating its entire project budget; in contrast, the Divisional operating funds that support attendance at subcommittee meetings are under pressure every biennium. One view that is worthwhile considering is that Division III Subcommittees effectively represent broader scale "project taskforces", and as such merit a portion of the funds that might otherwise be earmarked solely for Division III project activity. The majority of Division business is put forward to the main Divisional meeting from individual Subcommittee meetings; it is therefore essential that Subcommittee meetings are well attended.

Structure and governance: The Division has an Executive Committee comprising the current President (Prof Mary Garson), the Past President (Prof Krishna Ganesh), the President-elect (Prof Margaret Brimble) and the Secretary (Prof Axel Griesbeck; resigned December 2014). The current Executive has sought to ensure that Division practices and decisions are clear to all members, and that all Division members are informed as well as active and involved in Division business. In particular, Division members seeking officer and/or Titular member status are

reminded of the need to be involved in Divisional business, for example by suggesting new project initiatives or in project evaluation, or by acting as Chairs of Divisional sub committees.

Division minutes and reports are now archived on the Division website, and the process associated with the biannual Division election for President and new Titular members has been provided to the current Division membership.

IUPAC prizes: At its 2014 meeting, the Green Chemistry sub committee expressed some concerns about the small number of individuals applying for the CHEMRAWN prize for Green and/or Atmospheric Chemistry. The group reviewed the guidelines that govern the award of the prize, and made some recommendations to the Division and to the CHEMRAWN. The IUPAC secretariat was informed; discussions to finalize the guidelines are ongoing.

IV. Tabular Material:
The following pages provide additional details of projects and conferences as well as the membership of Division III for the 2014-2015 biennium.

Mary Garson
President of Division III (Organic and Biomolecular)
Brisbane, report 5 July 2015

Summary of Division III (Organic and Biomolecular) Projects (most recent first)
(July 2015)

BIENNIUM 2014-215

Project No: 2015-016-2-300
Title: *An introduction to Computational Chemistry and in-silico visualization; a Workshop for sub-Saharan Africa scientists*
Objective: The objective of the proposed Introduction to Computational Chemistry & In-silico Visualization Workshop for Sub-Saharan Africa scientists is to provide an introduction to computational chemistry, similar to the set of workshops that have already been delivered at the University of Kinshasa but which would now be provided with a larger regional remit. The Sub-Saharan Africa workshop would provide an introduction to molecular modeling in structural chemistry, medicinal chemistry and drug discovery. Application examples would be given, showing the value of these methods for research purposes but also for teaching purposes, as the visual illustration of chemical concepts has been shown to enhance their understanding by students. Existing local chemoinformatics resources such as the Kenyan Mitishamba database of about 2000 compounds would be used to demonstrate the value of such databases and how software can be used to extract valuable information from such sources. The overall aim is to help develop the ability to use software suites to build structural chemistry knowledge among the teachers who can then themselves train others, such that the knowledge transfer process can become self-perpetuating.
Chair: Lewis Whitehead
Members: Evans Changamu, Solomon Derese, Colin Groom, Juliette Pradon
Webpage: http://www.iupac.org/nc/home/projects/project-db/project-details.html?tx_wfqbe_pi1[project_nr]=2015-016-2-300
Start Date: 01-06-2015
End Date: 01-06-2016
Budget in USD: 4k (2 k from Div III with 2k from COCI)
Progress: update not yet available

Project No: 2015-003-2-300
Title: *Nomenclature of Homodectic Cyclic Peptides Produced from Ribosomal Precursors*
Objective: to disseminate through the scientific community guidelines for nomenclature of homodetic cyclic peptides produced from ribosomal synthesis. Specifically this includes N-to-Clinked peptides belonging to the groups cyanobactins, cyclotides, orbitides, amatoxins, phallotoxins and circular bacteriocins. By selection of a narrow focus we are hoping to develop a template that can be applied to develop nomenclature systems for other groups of peptides. Although peer-reviewed journals have published nomenclature recommendations the objective is also to consolidate literature and provide a IUPAC supported nomenclature recommendation. The project will expand and elaborate on the prior "Nomenclature of Cyclic Peptides" (http://www.iupac.org/project/2004-024-1-800) in the naming of the homodetic peptides.
Chair: Martin Reaney
Members: David Craik, Ulf Göransson, Gerard Moss, Ninghua Tan
Webpage: http://www.iupac.org/nc/home/projects/project-db/project-details.html?tx_wfqbe_pi1[project_nr]=2015-003-2-300
Start Date: 01-06-2015
End Date: 01-06-2017
Budget in USD: 10K (7.5 k from Div III and 2.5k from Div VIII)

Progress: update first meeting scheduled October 2015

Project No: 2013-054-2-300
Title: *Healthy Life and Active Ageing: the Contributions of Functional Food Ingredients*
Objective: to bring Chemistry to the general public demonstrating, through the implementation of an interactive website, how chemistry offers unique solutions for society needs in terms of a healthy living and a better ageing.
Chair: Amelia Rauter
Members: Amal-al-Aboudi, Mary Garson, Melissa Fitzgerald, Francesco Nicotra, Livia Sardaki
Webpage: not yet accessable
Start Date: 21-11-2014
End Date: 21-11-2017
Budget in USD: 7.5 k from Div III
Progress: update filming of video clips undertaken in March 2015 (Rauter, Garson, Sardaki, Nicotra) and website clips/recipes in preparation (June 2015)

Project No: 2013-057-3-300
Title: *Chemistry beyond Chlorine*
Objective: Publication of a book to improve the perception of the role of chemistry in issues of general interest
Chair: Pietro Tundo
Members: Lian-nian He, Ekaterina Lokteva, Murray McLaughlin, Claudio Jose de Araujo Mota, Bo Olssen, Qianghao Qu, Yehudah Shevah.
Webpage: http://www.iupac.org/nc/home/projects/project-db/project-details.html?tx_wfqbe_pi1[project_nr]=2013-057-3-300
Start Date: 1-5-2014
End Date: 01-05-2016
Budget in USD: 5.6 k ($4.8k Div III, $0.8k COCI)
Progress: *June 2014*. Website advises planning group will meet July 2014. No updates availableas of July 2015

BIENNIUM 2012-213

Project No: 2013-036-2-300
Title: *Glossary on Renewable Chemistry*
Objective: Construction and publication of a nomenclature guide – an IUPAC Glossary – related to biomass chemistry and green chemistry. Aimed at students (under graduation and graduation), professionals, and researchers from all countries.
Chair: Silvio Vaz Jr.
Members: Monica Damaso, Birgit Kamm, James Clark, Vincenza Faraco, Vitor Ferreira, Claudio Mota, Vania Zuin, Pietro Tundo.
Webpage: http://www.iupac.org/nc/home/projects/project-db/project-details.html?tx_wfqbe_pi1[project_nr]=2013-036-2-300
Start Date: 30-12-2013
End Date: 30-12-2015
Budget in USD: 5k

Progress: website updated (Jan 2014) with additional details of methodology and timelines. A draft glossary was circulated to TCG members and to Division members (May 2015). A range of comments were received, and the draft glossary is currently under revision.

Project No: 2013-041-3-300
Title: *Green Chemistry in Higher Education: towards a Green Chemistry Curriculum for Latin American and African Universities*
Objective: 1) Proposing general modules for up-to-date university Green curricula in general and subareas of chemistry of Chemistry courses (Bachelor and Teacher Training), together with their responsible lecturers;
2) Development (generation and/or adaptation) of Green Chemistry contents in theoretical and experimental disciplines of the involved universities in Latin America and Africa, considering the specific context of each region;
3) Contributing to establish permanently Green Chemistry in the education of Chemistry professionals in their initial courses and facilitating the public understanding of Green Chemistry principles showing its involvement in most aspects of common life and current demands nowadays;
4) Putting together universities, industries and governmental/non-governmental sectors in order to approach relevant themes and contents in the Green Chemistry modules
Chair: Vania Gomez Zuin, Lilliana Mammino
Members: Moacir Rossi Forim, Peter Seidl. Claudia Moraes de Rezende, Claudio Jose de Arajo Mota, Fernando de Carvalho da Silva, Carlos Alberto Marques, Patrocoa Vasquez, Gustavo Romaneli, David Gonzalez, Patricia Morales Bueno, Andoni Garritz Ruiz, Neil Coville, Temechegn Engida, Geoffrey Kamau, Egid Mobofu, Pietro Tundo, James Clark
Webpage: See
Start Date: 26-09-13
End Date: 26-09-17
Budget in USD (Expenditure to July 2013): 5k
Progress:. *July 2015*: website not up-to-date

Project No: 2013-040-1-300
Title: *Measurement of Photoluminescence Quantum Yields*
Objective: The quantum yield (QY) is one of the most important quantitative properties of a luminescent sample, and robust ways to measure it are essential in the application of luminescence techniques. In the project we will perform an inter-laboratory comparison of the two main methods for QY measurements, the classical relative method based on standards, and the absolute method using integrating spheres which recently gained popularity.
The outcomes will be: (i) insight into the reproducibility and inter-laboratory variability of QY measurements using the two methods; (ii) an extended set of standards and protocols for QY measurement.
Chair: Fred Brouwer
Members: Suzanne Fery-Fourges, Stephan Landgraf
Webpage: See http://www.iupac.org/nc/home/projects/project-db/project-details.html?tx_wfqbe_pi1[project_nr]=2013-040-1-300
Start Date: 26-09-13
End Date: 26-09-16
Budget in USD (Expenditure to July 2013): 4.5k
Progress: *Jan 2014* – update premature.

Project No: 2013-039-2-300
Title: *Nomenclature of Transition State Structures and their Analogs for Phosphoryl Transfer Reactions*
Objective: This Project seeks to establish a rational, logical, and practical system of nomenclature to identify discrete axial and equatorial ligands in both tbp and octahedral transition states and their analogues for phosphoryl transfer reactions. In many cases, these will be chirally defined only as a result of coordination to components of the enzyme active site where they are located. It will apply to TSs for "in-line" and/or for (theoretical) "adjacent" attack systems and be independent of considerations about "associative" and "dissociative" TSs. It will link to established IUPAC nomenclature systems and usage, in particular to IUPAC Red Book (2005). It will aim to be directly comprehensible to and useable by stakeholders who may not be specialized inorganic chemists
Chair: Michael Blackburn
Members: Jacqueline Cherfils, Gerry Moss, Nigel Richards, Jon Waltho, Nick Williams, Alfred Wittinghoffer
Webpage: See http://www.iupac.org/nc/home/projects/project-db/project-details.html?tx_wfqbe_pi1[project_nr]=2011-044-1-300
Start Date: 26-09-13
End Date: 26-09-15
Budget in USD (Expenditure to July 2013): 10k
Progress: *Jan 2015* –the task force group met in late 2014.

Project No: 2012-039-2-800
Title: *Carbohydrate Nomenclature – revision and extension of IUPAC recommendations*
Objective: The aim of this revision and extension is to bring up-to-date the existing Carbohydrate document in the light of the enormous progress made in the areas of glycoscience, biotechnology and bio-informatics in the past 20 years. Furthermore, the explosion of data stemming from glycomics and glycoproteomics, necessitates the connection with databases for presenting adequately carbohydrate structure and sequence information. There exist a number of databases, each covering different collections of data. Developing guidelines for harmonizing these data are within the goals to be achieved. Another aspect deals with the correction of some names.
Chair: J. Vliegenthart
Members: Jonathen Brecher, Frank Martin, Karl-Heinz Hellwich, Derek Horton, Thomas Lutteke, Gerard Moss, Stefan Oscarson, Amelia Rauter, Sandro Sonnino, Xavier Nuno
Webpage: See http://www.iupac.org/nc/home/projects/project-db/project-details.html?tx_wfqbe_pi1[project_nr]=2012-039-2-800
Start Date: 01-01-2013
End Date: not listed
Budget in USD (Expenditure to July 2013): $5.5k from Division III
Progress: *December 2013* –website updated.

Details of projects initiated during 2008-2009 and 2010-2011 have been provided in previous Divisional reports, for example the Division III report to the 95th Bureau meeting held in Coimbra (12-13 April 2014).

IUPAC Conferences under Auspices of Division III

International Conference on Green Chemistry (ICGC) series;
ICGC4 (Foz do Iguazzu, Brazil; co-chairs Arlene Gomea and Vania Gomez Zuin, August 2012; IUPAC representative Pietro Tundo
ICGC5 (Durban, South Africa) chair Lilliana Mammino (sasdestria@yahoo.com;), 17-21 August 2014; http://www.saci.co.za/greenchem2014/; IUPAC representative Pietro Tundo. ICGC6 will be held in Venice, Italy in September 2016 (chair Pietro Tundo).
2014 meeting: The main objective of the conference wqs to emphasize the importance of green chemistry for sustainable development, and to promote novel research and collaborations, by bringing together experts and interested parties from all over the world – from academia, industry and government. The conference considered all the major areas of green chemistry, including green synthesis processes, catalysis, environmentally benign solvents, energy storage, biofuels, green chemistry education, policies, and many other interesting topics. Interfaces with other sciences and other research areas were actively encouraged. Special attention was given to the roles of green chemistry in fast-growing economies and to the promotion of green chemistry in the African continent. A session on sustainability and security, conducted by the Organisation for the Prohibition of Chemical Weapons (OPCW) emphasized the links between scientific knowledge, education and policies with regard to the production and use of chemicals.

International Conference on Biodiversity and Natural Products (ICOB and ISCNP) series;
ISCNP27/ICOB7 (Brisbane 2011); IUPAC representative David Black
ISCNP28/ICOB8 (Shanghai); Yang Ye (yye@mail.shcnc.ac.cn; yeyang@live.cn), proposed dates October 20-25 2014; website address-http://iupac.simm.ac.cn; IUPAC representative Mary Garson.
ISCNP29/ICOB9 has been agreed for Izmir, Turkey in September 2016. Greece has expressed an interest to host ISCNP30/ICOB30.

International Conference on Organic Synthesis (ICOS) series;
ICOS19 (Melbourne, 2012); IUPAC representative Krishna Ganesh
ICOS20 (Budapest, Hungary); chair Péter Mátyus (matyus.peter@pharma.semmelweis-univ.hu;), Janos Wolfling; June 29-July 4 2014; http://www.icos20.hu/; IUPAC representative Mary Garson
ICOS21 (Mumbai, India) chair Krishna Kaliappan, December 2016. Florence, Italy will host ICOS22 September 2018 (chair: Alberto Brandi).
Update on ICOS20: ICOS-20 was held in ELTE Convention Centre at 29 June - 4 July 2014. Topics included new reactions and new reagents, applications and new trends in bioorganic chemistry, natural product synthesis, organic synthesis in materials research, organic synthesis in drug discovery and process development, and catalysis in organic synthesis. Plenary lecturers were: Prof. Margaret Brimble (New Zealand) Prof. Marco Ciufolini (Canada) Prof. Minoru Isobe (Taiwan) Prof. Eusebio Juaristi (Mexico) Prof. Max Malacria (France) Prof. Johann Mulzer (Austria) Prof. Jay Siegel (China) Prof. Lutz Tietze (Germany) Prof. Mark A. Rizzacasa (Australia). Professor Martin Burke (USA) was awarded the Thieme-IUPAC Prize for Organic Synthesis, and gave the award lecture.

International Conference on Biomolecular Chemistry (ISBOC) series
ISBOC9 (Beijing, 2012); IUPAC representative Krishna Ganesh
ISBOC10 (Pune, India, January 2015; Co-chairs Ganesh (ganesh1953@gmail.com) and Yamuna Krishnan (yamuna@ncbs.res.in). IUPAC representative: Mary Garson.
Update on ISBOC11: Konstanz, Germany has been proposed as the venue.

International Biotechnology Symposium (IBS) series
IBS 14 (Rimini, Italy) September 2010
IBS15 (Daegu, Korea) 2012; IUPAC representative Francesco Nicotra
IBS16 (Fortaleza, Brazil) chair Osvaldo Carrioca (jkriok@gmail.com), September 14-19; website http://ibs2014.org/; IUPAC representative Francesco Nicotra
IBS17 (Melbourne) contact: Glenn Cross (Ausbiotech), 23-28 October 2016
Update on IBS16: The meeting was well supported by R&D Brazilian Scientific Agencies and Brazilian Federation of Industry-CNI, as well as by the Brazilian Association of Chemical and Pharmaceutical Industries. For the first time the IBS-Symposium held a Biobusiness Forum to promote innovation in the country, as well as, the construction of an International Research Platform to promote and engage young students, doctors and researchers into an international biotechnology network leading to collaboration with members of the European Federation of Biotechnology. For that initiative, CAPES- Brazilian Agency for Advanced Post-graduation Studies provided financial support. The participation is confirmed of a Nobel Prize in Chemistry (2004) plus four distinguished scientists as Plenary Lecturers; six experts on Bioeconomy and thirteen outstanding invited speakers for the six parallel scientific sessions.. Elsevier Publishers (Journal on Biotechnologies Advances) offered an Special Issue on Bioeconomy and Biotechnology containing selected works by indicated guest editors.

International Conference on Heteroatom Chemistry (ICHAC) series;
ICHAC10 May 2012 (Kyoto, Japan); chair Norohiro Tokitoh (tokitoh@boc.kuicr.kyoto-u.ac.jp) http://oec.kuicr.kyoto-u.ac.jp/~ichac10/; Name of IUPAC representative – unknown.
ICHAC11 June 2015 (Caen, France); chair Annie-Claude Gaumont; website http://www.lcmt.ensicaen.fr/96621202/0/fiche___article/&RH=LCMT_FR.

International Symposium on Organometallic Chemistry Directed Towards Organic Synthesis (OMCOS) series;
OMCOS16 (Shanghai, 2011)
OMCOS17 (Fort Collins, July 28-August 1 2013); chair Peter Kundig (peter.kundig@unige.ch); IUPAC sponsorship approval pending; IUPAC representative still to be nominated.
OMCOS18 (Barcelona, Spain) 28 June - 2 July 2015; chair: Antonio M. Echavarren, Rubén Martín, Kilian Muñiz; website http://www.omcos2015.com/

IUPAC Symposium on Photochemistry series;
XXIV Symposium on Photochemistry, Coimbra, Portugal (15-20 July 2012); contact Hugh Burrows
XXV Symposium on Photochemistry, Bordeaux, July 13-18, 2014; chair: Dario Bassani (d.bassani@ism.u-bordeaux1.fr); website http://www.photoiupac2014.fr/. Contact: photoiupac2014@ism.u-bordeaux1.fr. IUPAC representative Silvia Braslavsky
Update on XXV Symposium on Photochemistry: The organization of the XXVth IUPAC Symposium on Photochemistry (Bordeaux, France from July 13 to 18, 2014) proceeded smoothly. The financial operations were the responsibility of the CNRS through their conference organization office of the local delegation, and the number of sponsors obtained was very satisfactory: 10 industrial exhibitors (2 more in negotiations) and 3 publishers. The local government provided substantial financial aid, which has been used to offset the relatively high organizational costs in France in order to maintain low inscription fees and lunches. Additionally, a dozen PhD grants (free inscription) were distributed. The city of Bordeaux agreed to provide free bus and tram tickets to all participants for the duration of the meeting. The IUPAC representative, Prof. Sylvia Bravlasky, provided a brief historical perspective of the meeting in commemoration of its 50th anniversary.
Update on XXVI Symposium on Photochemistry: Osaka. Japan. April 2016. Conference chair: Tetsuro

Majima. Preliminary website: http://web.apollon.nta.co.jp/iupac2016/invitation.html

IUPAC Conference on Physical Organic Chemistry (ICPOC) series;
ICPOC21 (Durham, UK) September 2012; RSC; IUPAC representative Krishna Ganesh
ICPOC22 (Ottawa, Canada) 10-15 August 2014; chair: Paul Meyer (pmmayer@uOttawa.ca); http://events.science.uottawa.ca/icpoc22/commitee.html; IUPAC representative Heidi Muchall (Concordia)
ICPOC23 (Sydney, Australia) July 10-14 2016; contact: Jason Harper. Website: http://www.icpoc23.unsw.edu.au/

MEMBERSHIP OF DIVISION III (2014-2015)

Name	*Status*	*Proposed Term*	*NAO*
Prof. Mary J. Garson	TM – President	2014-2015	Australia
Prof. Margaret A. Brimble	TM – Vice President	2014-2015	New Zealand
Prof. Axel Griesbeck	TM – Secretary	2012-2015	Germany
Prof. Krishna N. Ganesh	TM – Past President	2014-2015	India
Prof. G. Michael Blackburn	TM	2014-2015	United Kingdom
Prof. Alberto Brandi	TM	2014-2015	Italy
Prof. Thomas Carell	TM	2014-2015	Germany
Prof. Buxing Han	TM	2014-2015	China/Beijing
Prof. Francesco Nicotra	TM	2014-2015	Italy
Prof. Nikolay E. Nifantiev	TM	2014-2015	Russia
Prof. Amal Al-Aboudi	AM	2014-2015	Jordan
Prof. Vladimir Dimitrov	AM	2014-2015	Bulgaria
Prof. John F. Honek	AM	2014-2015	Canada
Prof. Péter Mátyus	AM	2014-2015	Hungary
Prof. Amélia P. Rauter	AM	2014-2015	Portugal
Prof. Zhen Xi	AM	2014-2015	China/Beijing
Dr. Nasim Sultana	NR	2014-2015	Bangladesh
Prof. Biing-Jiun Uang	NR	2014-2015	China/Taipei
Prof. Hrvoj Vančik	NR	2014-2015	Croatia
Prof. Miroslav Ludwig	NR	2014-2015	Czech Republic
Prof. Petri M. Pihko	NR	2014-2015	Finland
Prof. Yeun-Mun Choo	NR	2014-2015	Malaysia
Prof. Mary Olire Edema	NR	2014-2015	Nigeria
Dr. Oleg M. Demchuk	NR	2014-2015	Poland
Prof. Viktor Milata	NR	2014-2015	Slovakia
Prof. Tirayut Vilaivan	NR	2014-2015	Thailand
Prof. Berhanu M. Abegaz	PM	2014-2015	Botswana
Prof. Eusebio Juaristi	PM	2014-2015	Mexico
	10 TMs, 6 AMs, 10 NRs, 2 PMs		

AM = Associate Member
NR = National Representative
PM = Provisional Member
TM = Titular Member

Division IV: Polymer Division

The objective of this report is to summarize the activities of Division IV from the Bureau Meeting of 11-13 April, 2014 in Coimbra (Portugal) until the Bureau Meeting of August 2014 in Busan (Korea) and to discuss future goals for the Division.

In June 2015, Polymer Division has completed the following roster for the 2016-2017 biennium:

President: G. Russell; Vice-President: Christine Luscombe; Secretary: M. Walter; Past President: M. Buback;

Titular Members: Sabine Beuermann (Polymerization Kinetics and Processes); J. He (Structure and Properties of Commercial Polymers); I. Lacik (Conferences); M. Sawamoto (Strategy); Natalie Stingelin (Terminology); Y. Yagci (Trends in Polymer Science);

Associate Members: R. Advincula (Education); D. Auhl (Structure and Properties of Commercial Polymers); M. Hess (Education); R. Hiorns (Terminology); R. Hutchinson (Polymerization Kinetics and Processes);; G. Moad (Terminology);

National Representatives: R. Adhikari (Nepal); C.-H. Chan (Malaysia); Voravee P. Hoven (Thailand); C.-S. Hsu (China/Taipei); R. Jones (UK); D.-S. Lee (Korea); M. Malinconico (Italy); Olga E. Philippova (Russia); C. dos Santos (Brazil); J. Vohlidal (Czech Republic);

Interdivisional Activities

The Polymer Division is involved in several interdivisional projects, in particular with Division VIII. Division IV remains a committed member of the Interdivisional Subcommittee on Materials Chemistry. Contacts continue to exist with the Committee on Chemistry and Industry (COCI).

Polymer Division Meeting

The Polymer Division Meeting was held in Chiang Mai (Thailand) on July 4-5, 2014 with 34 attendees. A list of the current projects is compiled by the Secretariat and is available at the IUPAC website. Division IV is very active in carrying out IUPAC projects. The Chairperson of each Subcommittee monitors the projects including progress reports from the Task Group Leaders. As the reports on the projects are contained in the Minutes of the Division Meetings posted on the IUPAC website, only brief comments about the individual Subcommittees will be presented here. The activities of IUPAC Polymer Division are primarily carried out within the following four Subcommittees.

Subcommittee on Polymer Terminology (SPT)

The 2014 meeting of the Subcommittee was held at Chiang Mai (Thailand) between June 29 and July 3, 2014 prior to the IUPAC World Polymer Congress. Twenty-nine members and observers were attending. Via Skype four more members were

participating. SPT has had a very productive year, with projects being developed through electronic communication. Nevertheless the annual face-to-face meetings are extremely important for discussing the milestones and for resolving critical issues. It should be noted that six new members have joined SPT over the last three years.

After completion of several initiatives, five new projects have been launched, mostly in cross-science areas, e.g., where polymers are of interest to energy, health and medicine as well as to computer modelling. The completion of the project ”Nomenclature for chemically modified polymers” should be particularly mentioned, as this is seen as the flagship document for the extension of modern polymer nomenclature.

In the period covered by this report, the Subcommittee has worked on 18 projects, of which five have been concluded successfully, and one is close to being finished. As planned in Chiang Mai, five project applications have been submitted, with three still under review, and two of them already approved and funded.

The recent outcome of SPT work has been published in *Pure Appl. Chem. 86* (2014) 1003–1015, *Pure Appl. Chem. 87* (2015) 71–120; *Pure Appl. Chem. 87* (2015) 307–319, as well as in numerous Wikipedia pages now carrying IUPAC definitions through the project 2011-013-2-400 “Updating Wikipedia: Synchronizing Polymer Definitions and Terminology” and through internet entries for the Multilingual Polymer Glossary which is produced within the project 2007-008-1-400 “Development of a Multilingual Encyclopedia of Polymer Terminology”. Moreover, the Purple Book was made freely available on the IUPAC website.

The following projects have been successfully reviewed and most likely will be funded shortly:

2014-034-2-400 “Nomenclature for polymeric carriers bearing chemical entities with specific activities and names”;

2014-033-1-400 “Nomenclature and terminology relevant to lactic acid-based polymers: synthesis, structure, properties, applications and degradation”;

2015-012-1 “Terminology of Tissue Engineering and Regenerative Medicine in Polymer Science”;

2015-013-1-400 “Brief Guide to Polymerization Terminology”;

2015-014-1-400 “Guide (and Brief Guide) to Polymer Semiconductors”.

The project on ”Source-based nomenclature of single-strand organic polymers and copolymers will be sent to public review shortly.

The following projects are currently addressed, but have end-dates after August 2015: “Terminology and structure-based nomenclature of dendritic and hyperbranched polymers”, “Terminology on separation of macromolecules”, **“**Terminology for conducting, electro-active and field-responsive polymers”, “Preferred names for polymers”, “Revision of the web-based guide: IUPAC Recommendations on Macromolecular Nomenclature – Guide for Authors of Papers and Reports in Polymer Science and Technology”, “Definitions and notations relating to stereochemical aspects in polymer science”, “Terminology for chain polymerization”, “Keywords in polymer science journals”, “Terminology and nomenclature of inorganic and coordination polymers (TINCOPS) – an extended revision of Nomenclature for regular single-strand and quasi-single-strand inorganic and coordination polymers”,

"Terminology of nanomaterials and nanotechnology in polymer science" and "Structure-based nomenclature for regular linear star, comb and brush polymers".

There is an extended list of projects in preparation for submission, e.g., "Definition of terms relating to the ultimate mechanical properties of polymers"; "Brief Guide to the Characterization of Polymers", "Brief Guide to Polymer Microstructure"; "Polymers from renewable and recycled sources"; "Terminology for constitutionally-dynamic polymers", "Polysiloxanes"; "Polymer Inorganic hybrids", "Polymers for 3D printing"; "Evaluation of polymer crystals".

Special interest focuses on the project: "Updating Wikipedia: Synchronizing Polymer Definitions and Terminology" which aims at eliminating, for the area of polymer science, discrepancies between Wikipedia and IUPAC definitions. Beyond the interest in improving the polymer-related quality of Wikipedia entries, the entire set of IUPAC definitions and associated PAC publications should be linked, by an appropriate window, to Wikipedia. According to Wikipedia practice, some additional text, explanations and perhaps some historical background will be provided to meet the expectations of the wide readership. Polymer-relevant Wikipedia entries have to be checked against existing Division IV Terminology & Nomenclature documents and links have to be established. New IUPAC documents will be checked by the task group for linking with Wikipedia. Questions concerning graphics and videos also need to be addressed. Special measures need to be taken to identify later changes of the open encyclopedia and to find ways for recovery of the original text of the "IUPAC window"

Subcommittee on Structure and Properties of Commercial Polymers

This Subcommittee meets at least once per year to identify and work on scientific projects, mostly of an experimental nature. From seven scientists in 1963, the membership has increased to 68 from 12 countries. Twenty-seven scientists are from industry and 41 from academia or from research institutions. The SC thus continues to have a well-balanced membership. The SC projects are initiated by industry and funded by the participant organizations with an additional IUPAC budget for travelling costs. To maintain membership in the Subcommittee it is mandatory to participate in at least one project and to attend at least one meeting every two years. The 2015 Subcommittee meeting, which was No. 73, was held in Prague (Czech Republic), April 22-24, 2015, with 24 participants from 8 countries. The East Asian meeting of the SC was held in Luoyang, China, November 19-20, 2014, with 20 participants from three countries. The next meetings will be held November 4-5, 2015 in Busan (Korea) and April 2016 in Europe.

Two papers have recently been published with the serial numbers referring to the total output of papers over the years: [91] K. Wang, F. Wu, W. Zhai, W. Zheng, "Effect of polytetrafluoroethylene on the foaming behaviors of linear polypropylene in continuous extrusion", *J. Appl. Polym. Sci. 129* (2013) 4 and [92] M. Laun, D. Auhl, R. Brummer, D. Dijkstra, C. Gabriel, M. A. Mangnus, M. Rüllmann, W. Zoetelief, U. Handge, "Guidelines for checking performance and verifying accuracy of rotational rheometers: viscosity measurements in steady and oscillatory shear", *Pure Appl. Chem. 86* (2014) 1945–1968.

The projects 2010-029-3-400 “Relation between rheological properties and foam processability for polypropylene” and 2005-023-2-400 “Microstructural, melt processing and mechanical properties of compatibilized PA6/ABS Blends” have been completed. The current SC projects are on: “Guidelines for shear rheometer calibration and performance check” with a first paper in *Pure Appl. Chem. 86* (2014) 1945–1968 and “Elongational rheometry devices for shear rheometers” and ”Characterization, rheology and mechanical properties of high and ultra-high molecular weight polyethylene”. Four draft versions will serve the purpose of finalizing the projects on molar-mass analysis, on DSC characterization, crystallinity and crystallization, on micro-mechanics, entanglement and grain boundaries, and on macro-mechanics, cracks and wear behavior.

Feasibility studies are in preparation on the “Comparison between experiment and simulation of extrudate swell”; “Rheological behavior of thermoplastic polyurethane”; “Characterization of molecular structure”; “Transparent propylene/butane-1 random copolymer”; “Anti-bacterial and anti-mildew PP resin”; and “Deformation behavior of neck-forming polymers”.

Subcommittee on Polymer Education

The Subcommittee has been successfully chaired by Werner Mormann over many years. He will finish his service by the end of 2015. Chris Ober agreed to take over as an interim chair. The activities of SPE are directed towards supporting courses, workshops, and conferences, with particular emphasis on service for the developing world and for younger scientists.

As a recurrent event, the 18th UNESCO/IUPAC Postgraduate Course in Polymer Science will take place in Prague under the leadership of Pavel Kratochvil. University graduates and PhDs from countries with limited research facilities are given the opportunity to acquire knowledge about recent advances in polymer science to be used for the promotion of polymer science in their home countries. So far, the courses have been attended by 138 graduates from 20 countries with an output of 285 publications in international journals and 329 communications at international meetings associated with more than 4500 citations.

As another recurrent event, the IUPAC-endorsed POLYCHAR 23 Conference (World Forum on Advanced Materials) has been held in Lincoln (Nebraska), May 11-14, 2015. This conference enjoyed an IUPAC grant for support of students from developing countries. The 13th Annual UNESCO/IUPAC Workshop and Conference on Macromolecules & Materials will be held September 7-10, 2015 at Port Elizabeth (South Africa).

A two-days symposium on Polymer Education has been organized by the Subcommittee during Macro 2014 at Chiang Mai. The situation of polymer education in South-East Asia has been specifically addressed. Extended manuscripts will be included into volume 355 of the Macromol. Symp. Series (September 2015). The SC project on “Enhancing Educational Website for Polymer Chemistry” has been approved. Under the leadership of Chris Ober, this initiative will also investigate the

traffic that comes to the website and will provide information about matters of prime public interest.

As a finalization of the IUPAC transnational/transcontinental call on Polymer Science, organized and carried out under the auspices of the Subcommittee on Polymer Education, a symposium has been arranged during MACRO 2014 at Chiang Mai with presentations by the successful teams of the first round.

Subcommittee on Modeling of Polymerization Kinetics and Processes

This Subcommittee, which is co-chaired by Sabine Beuermann (Clausthal, Germany) and Robin Hutchinson (Kingston, Canada), has 45 members from 15 countries. The Subcommittee is active in critically evaluating kinetic parameters of polymerization processes and establishing reliable methodologies.

Two meetings of the Subcommittee were held, during MACRO 2014 at Chiang Mai in July 2014 and during the ACS National Meeting in San Francisco, August 2014. Within the kinetic activities of the Subcommittee, a paper on the propagation rate coefficient of methyl acrylate has been published (Polym. Chem. *204* (2014) 5. This recent paper has already been cited 10 times. The continued major interest in this kinetic work of the Subcommittee is demonstrated by the enormous and continuously increasing number of citations, with the benchmark paper on styrene being cited more than 500 times so far. It is pleasing to note that the reference data released by this IUPAC Subcommittee are accepted as benchmark values worldwide.

Monomer	Journal	Year	Web of Science Citations (July 1, 2015)
1. Styrene	*Macromol. Chem. Phys.*	1995	540
2. Methyl Methacrylate	*Macromol. Chem. Phys.*	1997	415
3. Alkyl Methacrylates	*Macromol. Chem. Phys.*	2000	175
4. *n*-Butyl Acrylate	*Macromol. Chem. Phys.*	2004	213
5. RAFT mechanism	*J.Polym. Sci. A*	2006	293

Related to the kinetic work, studies into the accurate molar-mass analysis of polymers have been carried out by the Subcommittee, resulting in the paper: “SEC Analysis of Poly(Acrylic Acid) and Poly(Methacrylic Acid), Macromol. Chem. Phys. *216* (2015) 23-27. Within a separate Subcommittee project, the kinetics of initiator decomposition is investigated, chiefly by Graeme Moad. A comprehensive manuscript, which provides a critical overview of the kinetics and mechanisms of commercially available dialkyldiazene initiators is in the process of being published in Prog. Polym. Sci..

Current Subcommittee projects deal with “Chain-length dependent termination kinetics”; “Vinyl acetate propagation kinetics”, and “Rate coefficients for styrene radical polymerization”. In preparation is a project to be chaired by Atsushi Kajiwara

on the EPR spectra of relevant radicals occurring in conventional and in reversible-deactivation polymerizations.

The project "Mechanistic details of RAFT polymerization", which has induced a remarkable flurry of publication activity, has essentially been finalized by the comprehensive manuscript on dithiobenzoate-mediated RAFT polymerization prepared by task-group member Graeme Moad in Macromol. Chem. Phys. *215* (2014) 9-26.

The next meeting of the Kinetics and Mechanism Subcommittee will take place during Pacifichem 2015.

Polymer Division Conferences

IUPAC-endorsed polymer-related conferences attract participants from all around the world. Endorsement is judged on the criteria of scientific quality, significance and suitability of the conference, evidence of sufficient advanced planning, suitable time spacing of conferences of a similar type, rotation of leadership for conferences in a series and a geographically diverse International Advisory Board, participation of industrial chemists and women as speakers and as members of the International Advisory Board.

The IUPAC-endorsed polymer symposia and conferences are listed on the IUPAC website. Ten such conferences are held in 2015 under the auspices of Polymer Division. So far, the following conference proceedings have been published in "Macromolecular Symposia": Macromolecules and Materials (Vol. 337); Polymer Spectroscopy (Vol. 339); Molecular Order and Mobility in Polymer Systems (Vol. 348); Ionic Polymerization Part I (Vol. 349) and Ionic Polymerization Part II (Vol. 350).

World Polymer Congresses

The WPCs are the flagship conferences of Polymer Division held in the even years. Actually, these MACROs are the largest polymer congresses worldwide. MACRO 2014 took place at Chiang Mai (Thailand) from July 6-11, 2014. Turkey will organize MACRO 2016 in Istanbul and Australia has received preliminary approval for MACRO 2018 to be held in Cairns. The largest IUPAC Polymer Division-endorsed conference of this odd year was the European Polymer Federation Congress in Dresden, June 21-26, 2015 with more than one thousand attendees and with an opening address being given by the President of IUPAC Polymer Division..

Further points of note from discussion at the Polymer Division Committee Meeting

The importance of early recruitment of new members for the division was discussed, as was the duration of projects. The project lifetime should be carefully estimated on the basis of the specific work program and should be checked by the subcommittee chairs.

The Polymer Division enormously benefits from the awards that are generously financed by companies and are presented during the biennial WPCs, i.e., the DSM–IUPAC Material Science Award, the Samsung–IUPAC Young Polymer Scientist Award, and the Polymer International–IUPAC Award. It has been discussed whether an 'Award Coordinator' should be installed to take care of this important initiative, prepare the calls and make sure that worldwide attention is paid to these awards and that the best candidates will be identified. The prestigious DSM–IUPAC prize (50.000 Euro) has been awarded at MACRO 2014 for the fourth time.

The following initiatives continue to command attention from the Polymer Division: involving younger scientists and colleagues from industry; strengthening polymer activities in developing countries; improving the role of the Polymer Division in education; strengthening the IUPAC label and enticing organizations to ask for IUPAC advice; broadening IUPAC service in the areas of terminology and nomenclature and in providing reliable benchmark data of polymerization-related rate data; recommending reliable techniques for measurement of polymer-relevant parameters and coefficients; strengthening the role of NRs by asking them to act as ambassadors for both sides, viz. their IUPAC Division and their NAO; recruiting excellent candidates for service to IUPAC.

Michael Buback
Division IV President
July 3, 2015

Report to Council from Division V

(Analytical Chemistry)
General Assembly Busan, August 2015

I. Highlights of the Division's activities

The Division of Analytical Chemistry continues to focus its activities on metrology and quality assurance in chemical measurements, compiling critically-evaluated data in solubility and other equilibrium processes, and the terminology of analytical chemistry.

- Metrology in Chemistry (MiC)
  Division V members represent IUPAC on the Joint Committee on Guides for Metrology (JCGM) (Paul De Bièvre) and its two working groups, WG1, which writes and maintains the Guide to the Expression of Uncertainty in Measurement (GUM) and its Supplements (Brynn Hibbert, until 2015 René Dybkaer), and WG2, which is responsible for the International Vocabulary of Metrology (VIM) (Paul De Bièvre, until 2015 René Dybkaer). IUPAC is mandated to use the terminology and guidance in these documents, and more must be done to both represent chemistry's views to the JCGM, and to explain the approaches and methodology of the VIM and GUM to chemistry. An annotated VIM with more user-friendly language is in preparation. The recent rejection by the member organisations of JCGM of the new edition of the GUM (including IUPAC) is causing the WG1 to re-evaluate its approach. No errors of statistics or logic were discovered, but the IUPAC assessment, for example, reads: (i) The consensus is that the JCGM 100 and 110 are documents that relate only marginally to the work of chemists and chemical engineers, (ii) The documents are written in a manner not easily understood and most impractical; (iii) If the document writers wish to reach the IUPAC audience and have this audience pay attention, the documents need to be revamped to make them relevant to the work of chemists and chemical engineers.
  Meanwhile the Division's Technical Report on Metrological Traceability of Chemical Measurement Results has become a *de facto* standard on how to establish traceability to metrological references (P. De Bièvre, R. Dybkaer, A. Fajgelj, D. B. Hibbert. Pure Appl. Chem. **83**, 1873, (2011)).
  Another recent highlight has been papers on human factors in chemical measurements out of a project from the Interdivisional Working Party for Harmonization of Quality Assurance (I. Kuselman, F. Pennecchi, C. Burns, A. Fajgelj, P. de Zorzi. Pure Appl. Chem. 84, 1939 (2012).)
  See also Paul De Bièvre report in Teamwork.

- Critically-evaluated data in solubility and other equilibrium processes (SSED)
  The single most productive enterprise of Division V is the output of the subcommittee on Solubility and Equilibrium Data (SSED) under the present chair Clara Magalhães. This

biennium celebrated the publication of volume 100 of the IUPAC-NIST Solubility Data Series – Rare Earth Metal Fluorides in Water and Aqueous Systems, Part 1. Scandium group (Sc, Y, La), by Tomasz Mioduski, Cezary Gumiński and Dewen Zeng was published in March 2014. During the 47th IUPAC General Assembly in 2013, it was suggested that SSED members should celebrate this important achievement, which is one of the long range IUPAC goals: the international standardization of physical constants. SSED members, supported by a project "One hundred volumes of Plenitude – Celebrating the IUPAC-NIST Solubility Data Series (2014-012-2-500) organised a half-day workshop at the National Fall meeting of the American Chemical Society in 2014. This participation was very fruitful and two publishers – Springer and De Gruyter – showed their interest in using the published data in their on line databases. The SSED held its annual meeting at the 16th International Symposium on Solubility Phenomena and Related Equilibrium Processes, Karlsruhe, Germany, (21 to 26 July, 2014).
The need to provide these data in a useful electronic format is looming as an important medium term goal, issues being a publishing model that can deliver as much data as possible to as many scientists at no cost to the recipient, how to maintain and update the database and what added value can be provided electronically.

- Terminology of Analytical Chemistry (the Orange Book)
  Published last in 1997 the Compendium of Analytical Nomenclature, now titled Compendium of Terminology in Analytical Chemistry, is so completely out of date that it needs rewriting. This project has been underway since 2008 and is nearing its end. The original 19 chapters will be reduced to 12 or 13, and many concepts will be re-termed and re-defined. This has caused some concern about how IUPAC treats colour books. Division V has agreed with PAC/ICTNS that all new and redefined terms will be submitted as PAC Recommendations. Then, once approved, the chapters will be re-assembled with existing Orange Book terms, terms from ISO standards, and terms from JCGM (VIM and GUM) and whatever rubric will be added. This procedure will entail considerable editorial work, but we believe this is the best way of ensuring that only properly approved terms will appear in the colour book, and then in the Gold Book. Submitted to PAC is Chapter 2 on Chemometrics. Several other chapters are near to submission. We have had problems with Spectroscopy, but hope to see the Orange book completed in 2016.
  The new edition of the Orange Book could well be the last physical book that is produced in the colour book series. A project (2013-052-1, IUPAC Color Book Data Management) is looking at ways to make the Gold Book independent of its platform and create a modern content management system (CMS). The main benefit of this approach is that terms and their definitions, notes, examples and references can be approved by ICTNS and then instantly be available for the web site, colour book edition or whatever purpose. A demonstration database and CMS will be presented at the General Assembly.
  The Division believes that PAC should adopt the ISO approach to creation of vocabularies (ISO. Terminology work - Vocabulary - Part 1: Theory and application, 1087-1:2000, Geneva).

II. Report of Division activities 2014/15
(in terms of relevant long term goals)

- *IUPAC will provide leadership as a worldwide scientific organization that objectively addresses global issues involving the chemical sciences.*

Division V is at the heart of metrological applications in chemistry, together with critically evaluated data. Gold Book and PAC definitions, as chemical terms with the highest authority, have been quoted in courts of law in Australia and Europe. There is no doubt that IUPAC is considered the world authority to determine terminology and nomenclature in the chemical sciences. Through the close association of Division members with NMIs (National Metrology/Measurement Institutes) and standardization bodies (ISO) we ensure chemistry is at the top table in discussions about measurement. We note that the SSED has published in the Journal of Physical and Chemical Reference Data for many years in a collaboration with NIST (National Institute of Science and Technology, the USA national measurement institute). The work of the Interdivisional Working Party for Harmonization of Quality Assurance coordinates with the International Atomic Energy Authority (Vienna).
Finally the participation of IUPAC, through members of Division V, in JCGM and its working parties, and the CCQM shows IUPAC leadership in chemical aspects of measurement and units.

- *IUPAC will facilitate the advancement of research in the chemical sciences through the tools that it provides for international standardization and scientific discussion.*

The products of the Division are the SSED series and our Technical Reports and Recommendations. See list of projects ad publications in the next section. In the near future the Orange Book and the Colour Book database will be added. In April 2014 two members of the Division (Brynn Hibbert and Paul De Bièvre) gave invited presentations to a CCQM workshop on the mole as part of the deliberations on the proposed revision of the SI.

- *IUPAC will foster communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing countries.*

The Division took the opportunity to hold its between-GA meeting in Pecs in Hungary. At the same time as the Division meeting we invited chemists from the local university to join us and observe the workings of the Division. After the formal meeting a one-day workshop was organised on chromatography and separation science, which also included local people.

- *IUPAC will utilize its global perspective and network to contribute to the enhancement of chemistry education, the career development of young chemical scientists, and the public appreciation of chemistry.*

At the GA in Istanbul, Division V had one of the largest cohorts of Young Observers (possibly because we started our meeting somewhat earlier than other divisions). As a result we sponsored two projects from Young Observers and their accompanying persons: Mark Kinnan 2013-052-1, IUPAC Color Book Data Management, and Christine Straut 2013-055-2-024 Increasing IUPAC's Social Media Presence. We also note the project 2013-013-1-500 pH Measurement in Seawater, which is, in some way, a legacy of the International Year of Chemistry.
Immediate Past President Maria Filomena Camões, is Coordinator of EuroMaster– "Measurement Science in Chemistry" (MSC), www.msc-euromaster.eu/, which is now in its 8th edition and is the result of an initiative of a consortium of 9 European universities. This Masters

course in Analytical Chemistry boasts a 95% employment rate of its graduates. Division V supports this initiative through Professor Camões and offers help and advice on practical matters in analytical chemistry.

- *IUPAC will broaden its national membership base and will seek the maximum feasible diversity in membership of IUPAC bodies in terms of geography, gender, and age.*

We have strong representation from NAOs and cover all continents (in which IUPAC has a presence) in our membership. Our immediate Past President is female, as is the Chair of the SSED. There are four females and twelve males among the current officers, TMs and AMs. Our weakness is in the age structure – most are at the senior stages of their careers. We suspect we are not alone in this problem.

III. Other material

We have decided to reproduce Teamwork, the Division magazine to detail the activities of the Division in the Biennium. The copy is a draft – the completed magazine, Issue 18, will be on the website at http://www.iupac.org/home/about/members-and-committees/divisions/v/teamwork.html for the Busan GA. Note that some tabular material that will be in Teamwork is transferred to part IV of this report.

TEAMWORK

the Magazine of the ACD - July 2015

Welcome to Teamwork 2015

Teamwork is the periodically published product of the Analytical Chemistry Division since 2002. Preparing this magazine, the Division informs its main activities and key products coming to the IUPAC General Assembly, and, at the same time, announce what the Analytical Chemists are doing and thinking about. Further information can be found on the IUPAC Analytical Chemistry Division website: http://www.iupac.org/nc/home/about/members-and-committees/db/division-committee.html?tx_wfqbe_pi1[title]=Analytical%20Chemistry%20Division&tx_wfqbe_pi1[publicid]=500

On behalf of the Division V President *Brynn Hibbert*, I would like to express best wishes to the Division meeting at the 48th IUPAC General Assembly in Busan, Korea.

Jan Labuda, the Vice-President of the Division

This issue of the Teamwork includes:

13. International Workshop on Determining Antioxidants as Reactive Species Scavengers, Istanbul, 27 to 28 October, 2014
14. Membership of the ACD (2014 – 2015)

Message from David Brynn Hibbert, the President of ACD

My I add my welcome to that of the editor to this edition of Teamwork. The Analytical Division of IUPAC continues to be active in the fields of critically-evaluated data (through the energetic work of Clara Magalhães and the SSED), quality assurance and metrology in chemistry, pH (our newest subcommittee) and the on-going revision of the Orange Book. We have continued, during the changing of the guard (or some of them) at Headquarters, to support Analytical Chemistry and to contribute to the work of IUPAC through membership of the Bureau, ICTNS, CPCDS and other committees and bodies, internal and external to IUPAC. See later in this report for a full report of our representation.

Our involvement with the Joint Committee for Guides on Metrology and its working groups is perhaps seeing the end of an era, with the recently announced retirement of René Dybkaer. His knowledge of metrology and terminology is legendary and his "An Ontology on Property for physical, chemical, and biological systems" (www.ontology.iupac.org) has provided the logical framework for many publications in this field. Reports from our representative Paul De Bièvre will be found elsewhere in this newsletter.

Officers and Division meeting in Pecs, Hungary, 27 and 28 March, 2014

Our off-year (between General Assemblies) Division meeting was held in March 2014 in Pécs in Hungary at the Hungarian Academy of Science. This amazingly embellished building in the Italian Renaissance style had been built by one of the wealthiest merchants in Pécs, György Vasváry in 1884 and provided a magnificent home for our meeting. I was honoured to stay in the President's suite, which had furniture and décor very fitting to our endeavours. Most officers and TMs attended (Prof. D. Brynn Hibbert, Prof. Jan Labuda, Dr. Zoltán Mester, Prof. Maria F. Camões, Prof. Christo Balarew, Prof. Attila Felinger, Prof. M. Clara F. Magalhães, Prof. Yi Chen, Prof. Heli Sirén, Prof. Tatyana Maryutina) and the NR from Belgium Prof. Paul De Bièvre also was present. During our meeting we had visits from chemists from the local university.

The meeting discussed organisation of the Division, reviewed projects and received reports from our representatives on committees. There was a long discussion on the revision of the Orange Book, and a following seminar on Analytical Separation methods at which the draft of Chapter 4 was discussed and planned.

At the 2013 General Assembly in Istanbul the Division became a sponsor of a project to consider the IUPAC position on the proposals for revision of the SI (A critical review of the proposed definitions of fundamental chemical quantities and their impact on chemical communities, # 2013-048-1). Our representative Zoltan Mester gave a report on the initial work of the task

group. Paul De Bièvre and Brynn Hibbert had been invited to give presentations to a CCQM workshop at the BIPM on the redefinition of the mole in April. The need for IUPAC to advise on the quantity amount of substance and its unit mole has been recognised by the CPGM. To what extent our voice will be heard remains to be seen.

The minutes can be accessed at the web page
https://www.dropbox.com/s/p4vbu36nndp3s2x/Attendance%20sheet%20Division%20Committee%20Meeting%202014%20Pecs.docx

Division meeting 27 and 28 March 2014, Villa Vasváry, Pécs, Hungary. Left to right: Prof. Attila Felinger, Prof. Maria F. Camões. Prof. Tatyana Maryutina, Prof. Heli Sirén, Prof. Yi Chen, Prof D. Brynn Hibbert, Prof. Paul De Bièvre, Dr. Zoltán Mester, Prof. M. Clara F. Magalhães, Prof. Christo Balarew, Prof. Jan Labuda.

Membership of committees

The Division has concerns about the organisational structure for the appointment of IUPAC representative to outside bodies. At present there is no clear process to approve and fund these very important roles. A list of ACD members on internal and external committees is given below.

Body/ Committee/ Organisation	Membership
Internal	

Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS)	Brynn Hibbert
Committee on Chemical Education (CCE)	Yi Chen
Committee on Chemical Industry (COCI)	Christo Balarew
Committee on Publications and Cheminformatics Data Standards (CPCDS)	Brynn Hibbert
Pure and Applied Chemistry (PAC) Editorial Advisory Board	Nelson Torto
External	
International Committee on Weights and Measures/Consultative Committee on the Amount of Substance (CIPM/CCQM)	Aleš Fajgelj
ISO-Committee on Reference Materials (ISO/REMCO)	Aleš Fajgelj
Joint Committee for Guides in Metrology (JCGM)	Paul De Bièvre
Joint Committee for Guides in Metrology Working Group1 (JCGM WG1)	Brynn Hibbert and René Dybkaer
Joint Committee for Guides in Metrology Working Group 2 (JCGM WG2)	Paul De Bièvre and René Dybkaer
Inter-Agency Meeting (IAM)	Zoltán Mester
EUCHEMS	Filomena Camões and Jan Labuda
African analytical network	Nelson Torto
CITAC	Ilya Kuselman/ Aleš Fajgelj

I am looking forward to meeting as many of you as possible for the ACD meetings at the GA in Busan, Korea, on the 8th and 9th August.

David Brynn Hibbert, President

HOT TOPICS

Revision of the Orange Book

Brynn Hibbert

The revision of the Orange Book is, hopefully, in its latter stages, with twelve chapters being worked on by task groups, some backed by projects.
The new edition will be titled “Compendium of Teminology in Analytical Chemistry” and will be a vocabulary of concepts with definitions of terms that are compatible with the Gold Book.

The present status of chapters of the OB is:

Chapter	Editor	Comments
Chapter 1: Fundamental concepts and terms (metrology), quality assurance.	Paul De Bièvre	Draft under discussion
Chapter 1a. Chemometrics terms	Brynn Hibbert	PAC Recommendations about to be submitted
Chapter 2: Sampling and sample preparation	Janusz Pawliszyn	PAC Recommendations about to be submitted
Chapter 3: Methods of analysis depending on measurements of mass and volume	Maria F. Camões, (TM)	Awaiting draft
Chapter 4: Separation	Tatyana Maryutina, (AM)/ Attila Felinger (TM)	Revised draft under discussion.
Chapter 5: Spectroscopic methods of analysis	Derek Craston (LGC)	looking at possibilities
Chapter 6: Mass spectrometry	Zoltan Mester (TM)	Draft under discussion
Chapter 7: Electrochemical methods of analysis	José M. Pingarrón, (TM)	Draft under discussion
Chapter 8: Radioanalytical methods	Zhifang Chai, Peter Bode (AM)	Two versions available. PB to prepare consolidated draft.
Chapter 9: Surface analysis	Jim McQuillan (Jim is a late comer to this chapter and kindly stepped in after the untimely death of Luisa Abrantes)	Awaiting draft
Chapter 10: Thermal methods of analysis	Carlos Castro	Awaiting draft
Chapter 11: Immuno- and bio-analytical methods of analysis	Jan Labuda, (TM)	Third draft under discussion.

It can be seen that about half the chapters are in a reasonably advanced state. The editor (DBH) will help prepare PAC Recommendations for new terms and definitions (not including ones unchanged from the present OB, JCGM and ISO Standards), and when these have gone through the PAC review process, will be reintegrated into the OB. Because of the size of the draft chapters and two-paced nature of the appearance of drafts, we might contemplate publishing the OB in two volumes.
It is also expected that going through PAC recommendations will facilitate uptake into the new electronic Gold Book, being worked on by project "IUPAC Color Book Data Management" http://www.iupac.org/project/2013-052-1-024.

News from the revision of IUPAC Colour Books

Paul De Bièvre, the IUPAC Representative to the JCGM (Joint Committee on Guides for Metrology)

We (ORANGE BOOK, Chapter 1 responsibles) proceeded by just borrowing from VIM all the concept definitions we deemed useful or necessary for Analytical Chemistry, thus automatically keeping the format etc, leaving the ultimate choice of format for later: that is to be decided on the "OB level".

We thereby observed - and followed the logic - that VIM and GUM are the ultimate base documents for all communication in science and technology, and unanimously approved after formal reviewing and voting procedures by eight international organizations: BIPM, IEC, IFCC (yes!), ILAC, ISO (yes!), IUPAC (yes!), IUPAP, OIML; that has made VIM and GUM into some sort of binding "documents" for all these organizations, and, in fact worldwide, for the fields concerned.

ISO Guides and Standards (including ISO International Standard ISO 10241-1 - as other Standards which chemists are simply unaware of (sic!) - are looked at by 2/3 of the world population as "lighthouses" or "references" for intercontinental understanding (as the name and membership of ISO implies), not just "international" i.e. Western world. We do not expect that a small field (chemistry / IUPAC) could convince the other seven members of the approving "Club of Eight" to change the ground rules for defining concepts and the way to write them. That is particularly true for the SILVER BOOK 1 (1995), approved as an IFCC-IUPAC undertaking, and now being reviewed to be approved by IFCC and IUPAC as "SILVER BOOK 2". Further to the previous point: in view of the importance to have a formal reference document in heavily regulated Clinical Analysis and Laboratory Medicine, any change has the potential to cause big problems (changes in regulations are not that easy to perform).

As far as we can perceive, in the International Vocabulary of Nominal Properties (VIN), now on its way, the same principles have been used as in VIM (and GUM).

Further: the substitution principle is a very logical and compulsory principle in the definitions we agree.

Hence, this problem of "standardization" (a field of ISO "par excellence") does concern all of us and has the potential of wide ramifications, e.g., in the revision of other Color Books such as the (badly needed) Gold Book …

We urge deep reflecting on the above and discourage any definition deviating from the above guiding principles before all of the consequences of choices have been carefully reviewed, and the "way out of chaos" in terminology has been carefully established.

JCGM report

Paul De Bièvre, the IUPAC Representative to the JCGM (Joint Committee on Guides for Metrology)

1. The 2014 JCGM meeting was held on 2014-12-03 at the location of BIPM, one of the JCGM members, currently chairing JCGM for the period 2014-2016.
2. The JCGM heard reports from its WG1 (on the GUM) and its WG2 (on the VIM).
3. It was decided to have a closer look at the re-written Chapters 1, 2 and 3 of the SI Brochure (in the light of the ongoing revision of the SI units) in the light of the March 2015 deadline to submit comments to the CCU.
4. A small WG on "Dimensionless Quantities" has been set up at the instruction of Prof. J. Ullrich (the new President CCU) headed by J. Stenger (PTB); meeting in Feb 2015.

5. We reported that there was no news on the IFCC - IUPAC joint VIN (presumably still in the IUPAC - IFCC evaluation stage). I have been asked to enquire about this.
6. A report was heard from ISO - REMCO on RMs for "qualitative analysis".
7. The current Secretary of the JCGM, Dr. C. Thomas, will resign from her office at BIPM (and of JCGM Secretariat) in June 2015. She will be succeeded by Dr. R. Sitton (BIPM).
8. The next JCGM meeting is on 2015-12-02
9. An increasing use of the GUM in the chemical community was reported. Idem for the VIM.
10. Another discussion took place about the choice between "giving guidance to the lab floor" vs "inputting from the lab floor into the VIM"
11. A message was given to the ISO Delegate, Mrs. Mercè Ferrrés, about ISO 5725 being in bad need of revision.
12. Increasing interest and use of GUM and VIM in the chemical community was reported.
13. The revision of the IUPAC ORANGE BOOK was announced and and the achievement of the revised SILVER BOOK 2 communicated to JCGM.
14. Examples of MTr Chains of measurement data obtained on biological materials are very much wanted (dixit IFCC President Beastall)!

Update on SI redefinition

Zoltan Mester

Presentations to CCQM (10th April, 2014) can be found on the website:
https://www.dropbox.com/s/51t4n1zol91y9lm/CONCERNS%20and%20ISSUES%20in%20the%20re-definition%20of%20the%20mole%20copy%202.ppt
https://www.dropbox.com/s/hcnwaddb3vesgxz/Presentation2CCQM.pptx

Cooperation with EuCheMS and ECTN

Maria Filomena Camões, EuroMaster Coordinator

The EuroMaster programme “Measurement Science in Chemistry” (MSC), *www.msc-euromaster.eu/,* is now at its 8th edition and is the result of an initiative of a consortium of 9 European universities, University of Lisbon- P, University Claude Bernard Lyon 1- F, University of Warsaw- PL, University Maria Curie-Skłodowska- PL, University Adam Mickiewicz- PL, University of Tartu- EE, University of Oulu- Fin, Free University of Brussels-B, University of Maribor- Sl, and of the JRC-IRMM. It has been awarded the Eurolabel® by ECTN for the 2nd consecutive period, since 2007. The MSC EuroMaster is associated with the Master course in Analytical Chemistry at the students’ home universities. Between the 1st and the 2nd year the students benefit from a two week intensive course, the famous Summer School where, in an international environment, real life challenges such as running a laboratory under the requirements of the ISO/EN 17025, add competences and skills that make the difference.

A meaningful employability rate of 95%, very different from the general picture of high unemployment, is the situation for the 280 students who have graduated since 2008. Celebrating success (see Photo), 46 students participated in the 3rd graduation ceremony, that took place

recently (12th December 2014) in Brussels at the Royal Flemish Academy of Belgium for Science and the Arts. Profiting from this opportunity a workshop on "Employability of Chemistry Graduates" was organized. The various perspectives of both trainers and employers were presented and debated. The invited speakers were Professors Reiner Salzer (DAC-EuCheMS), David Cole-Hamilton, (EuCheMS), Francesco De Angelis (ECTN) and Dr. Sophie Wilmet (CEFIC).

A protocol was signed by MSC, ECTN and EuCheMS stressing the active cooperation observed along the past years and strengthening new forms of future collaboration.

Reports from Subcommittees

Subcommittee on Solubility and Equilibrium Data

Clara M. Magalhães, Chair of SSED and TM of Division V

The year of 2014 was very special for the members of the SSED. The first part of the Volume 100 of the IUPAC-NIST Solubility Data Series – Rare Earth Metal Fluorides in Water and Aqueous Systems, Part 1. Scandium group (Sc, Y, La), by Tomasz Mioduski, Cezary Gumiński and Dewen Zeng was published in March 2014 in the volume 43 (number 1) of the Journal of Physical and Chemical Reference Data. The Part 2, Rare Earth Metal Fluorides in Water and Aqueous Systems, Light Lanthanides (Ce-Eu), is just being published in the volume 44 (number 1) by the same authors.

Once the publication of one hundred volumes inside a very specialized scientific subject is a very rare achievement, it was considered important to celebrate it in a special way. During the 47th IUPAC General Assembly in 2013, David Martinsen and René Deplanque suggested that SSED members should celebrate this important achievement, which is one of the long range IUPAC goals: the international standardization of physical constants. It was suggested that SSED members participate in the National Fall meeting of the American Chemical Society in 2014,

once this is a meeting with a large participation of chemists, not only from the United States of America but also from all around the world. The project "One hundred volumes of Plenitude – Celebrating the IUPAC-NIST Solubility Data Series (project number 2014-012-2-500) was submitted and approved.

248th ACS National Meeting, San Francisco, CA – Session: The IUPAC Solubility Data Series: 100 volumes of Solubility Data Online – Wednesday, 13August, 2014

The members of SSED were responsible for the half day session "The IUPAC Solubility Data Series: 100 volumes of Solubility Data Online" that occurred on the 13th August 2014 in San Francisco, California. This participation was very fruitful and two publishers – Springer and De Gruyter – showed their interest in using the published data in their on line databases.

The following lectures were presented in the session:

- Mark Salomon (SSED member and IUPAC Editor-in-Chief of the Solubility Data Series): Objectives of the Solubility Data Series
- Allan H. Harvey and Donald R. Burgess (Co-Editors-in-Chief of the Journal of Physical and Chemical Reference Data): NIST Standard Reference Data and the Solubility Data Series
- Stuart Chalk (University of North Florida): REST API for the IUPAC Solubility Data Series: A "Skunkworks" project
- Zdeněk Wagner, Johan Jacquemin and Magdalena Bendová (SSED and members of the IUPAC project "Database on solubility and liquid-liquid equilibria of binary mixture of (ionic liquid and molecular solvent)"): Database on ionic liquids solubilities in molecular solvents: Progress and prospects
- Glenn Hefter (SSED member and Chair of the Stability Constants subsubcommittee): Critical Evaluation of Stability Constant Data by IUPAC
- William E. Acree Jr. (SSED member): Models to evaluate experimental solubility data for crystalline nonelectrolyte solutes in organic mono-solvents and solvent mixtures
- Earle Waghorne (Secretary of SSED): Thermodynamics of electrolyte solubility in mixed solvents: Silver halides
- M. Clara F. Magalhães and Justin Salminen (Chair and members of SSED): Possible contributions from the Solubility Data Project for arsenic and carbon dioxide environmental impacts mitigation

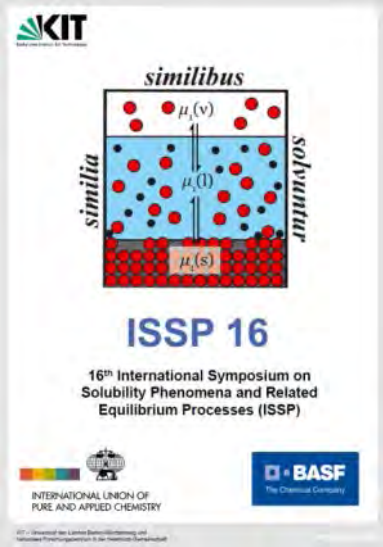
Presenters of the oral communications in The IUPAC Solubility Data Series: 100 volumes of Solubility Data Online. Back row from left to right: William Acree, Mark Salomon, Stuart Chalk, Allan Harvey; Front row from left to the right Glenn Hefter, Clara Magalhães, Johan Jacquemin, and Earle Waghorne

A full report by Clara Magalhães

can be found in the ACS Chemical Information Bulletin (2014) 66(4), pp. 47-50 that can be viewed from the web address: http://bulletin.acscinf.org/PDFs/CIB_66-4.pdf

16th International Symposium on Solubility Phenomena and Related Equilibrium Processes, Karlsruhe, Germany, 21 to 26 July, 2014

The 16th International Symposium on Solubility Phenomena and Related Equilibrium Processes was organized by the Karlsruhe Institute of Technology, Institute for Nuclear Waste Disposal (KIT-INE), Karlsruhe Germany. This IUPAC-sponsored symposium included a workshop entitled "Solubility and Speciation in Nuclear Waste Disposal". The 13th Annual meeting of the Subcommittee on Solubility & Equilibrium Data (SSED) of the IUPAC Analytical Chemistry Division met on the 20th July 2014, chaired by TM Clara Magalhães from Portugal.



More than one hundred participants from 24 countries (Australia, Austria, Bulgaria, Canada, China, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Poland, Portugal, Russia, Serbia, South Korea, Spain, Sweden, Switzerland and USA) representing four continents attended the meeting and the workshop. Five plenary and two invited lectures focused on the seven specific topics related to solubility: 1. Investigation and analytics of aqueous solutions; 2. Aqueous solutions at high ionic strength; 3. Kinetics of phase transformations; 4. Molten salts and ionic liquids; 5. Effects of solute-solvent interactions on solubility phenomena; 6. Solubility phenomena in technical and industrial applications; 7. Computer assisted equilibrium calculations and related thermodynamic databases. Forty short communications and fifty posters were also presented during afternoon and morning sessions.

Franzosini Award: Magdalena Bendová, Institute of Chemical Process Fundamentals Prague, Czech Republic, and S. Gadzuric, University Novi Sad, Serbia were the recipients of the 2014 Franzosini Award.

Three poster prizes were also given.
Sponsorship was provided by IUPAC, the NUSAFE program of HGF (Germany), and the BASF company.
During the conference banquet was celebrated the 80th birthday of Christo Balarew. Clara Magalhães chaired the session and Stefka Tepavitcharova introduced the curriculum vitae of Christo Balarew focusing his achievements in IUPAC and his research in the field of solubility.

The book “The Experimental Determination of Solubilities” edited by G. T. Hefter and R. P. T. Tomkins was offered him as a birthday gift.

13th Annual meeting of the Subcommittee on Solubility and Equilibrium Data on the 20th July 2014, in Karlsruhe, Germany

Projects

Recently completed projects

Within last two years, the following projects have recently been completed:
1. 2008-002-1-500, B. Hibbert chair
2. 2014-006-1-500, W. E. Acree chair

Running projects

The Division has about 35 running projects, including those that belong to the Subcommittee on Solubility and Equilibrium Data, the Interdivisional Working Party for Harmonization of Quality Assurance and interdivisional projects. At present, the division focuses its human and financial resources on the updating of the Orange Book.The division feels that the division projects are running reasonably well.

New projects

The following projects have recently been approved:
1. 2014-012-2-500, C. Magalhaes chair
2. 2014-027-1-500, I. Kuselman chair

Meeting Reports

International Workshop on Determining Antioxidants as Reactive Species Scavengers, Istanbul, 27 to 28 October, 2014

The workshop was organized jointly by the Istanbul University and the Analytical Chemistry Division of IUPAC with Prof. Dr. Reşat APAK (Istanbul University), the workshop chairman, and Assist. Prof. S. Esin ÇELİK (Istanbul University), the workshop secretary. Alltogether 95 participants attended the workshop. Book of Abstracts is online published in the workshop website: http://antioxidantworkshop2014.istanbul.edu.tr/

Plenary speakers were:
- Prof. Dr. Antony Calokerinos (National and Kapodistrian University of Athens): "Luminescent methods for the evaluation of antioxidant activity of olive oil and other natural products"
- Prof. Dr. Sheal Gorinstein (The Hebrew University – Hadassah Medical School): "Nutritional and Pharmaceutical Applications of Bioactive Compounds of Some Edible Berries and Tropical Fruits"
- Prof. Dr. Marcela Segundo (University of Porto): "Automatic flow based methods to evaluate the scavenging activity of antioxidants against ROS and RNS"
- Prof. Dr. İlhami Gülçin (Atatürk University) "Antioxidant compounds: Structure-carbonic anhydrase isoenzymes inhibition studies"
- Prof. Dr. Reşat Apak (Istanbul University): "Comparative evaluation of selected antioxidant capacity/activity assays with special reference to CUPRAC, CERAC and ferricyanide methods"

Keynote Speakers and Lectures were given by:
- Prof. Dr. Vural Gökmen (Hacettepe University): "Antioxidants Bound to Insoluble Food Matrix: Their Measurement, Regeneration Behavior, and Nutritional Relevance"
- Prof. Dr. Cevdet Demir (Uludağ University): "CHROMAC Antioxidant Capacity Method: Principles and Applications"
- Assoc. Prof. Esra Çapanoğlu Güven (Istanbul Technical University): "Evaluating the in vitro bioaccessibility of phenolics and antioxidant activity during consumption of dried fruits with nuts".

Family photo of the International Workshop on Determining Antioxidants as Reactive Species Scavengers in Istanbul University Congress & Cultural Center.

Prof. Apak, Workshop chairman, presented copper plates to the plenary speakers at gala dinner held in Istanbul University Baltalimanı Social Facility.

IV. Tabular material.

Membership of the ACD (2014 – 2015)

Officers	
President of the Division	Brynn Hibbert
Vice President	Jan Labuda
Secretary	Zoltán Mester
Past President	Filomena Camões
Titular Members	
	Christo Balarew,
	Yi Chen
	Attila Felinger,
	Kim, Hasuck
	M. Clara Magalhães,
	Heli Sirén
Associate Members	
	Resat Apak,
	Peter Bode,
	Derek Craston,
	Yook Heng Lee,
	Tatyana Maryutina,
	Nelson Torto
National Representatives	
	Othman Othman Chande
	Laurence Charles
	Paul De Bièvre
	Marcos Eberlin
	Ales Fajgelj
	Kate Grudpan
	Javed Hanif
	Daniel Mandler
	Predrag Novak
	David Shaw

Publications

Note publications dated 2013 that were not included in the last report are given here.

Articles in Chemistry International

D. Brynn Hibbert, Twitter in Chemical Education, and IUPAC

2015, Vol. 37, Issue 3, p. 10–11

Marcus Altmaier, Solubility Phenomena and Related Equilibrium Processes

2015, Vol. 37, Issue 2, pp. 30-31

David Shaw, 100 volumes of IUPAC's Solubility Data Series

2015, Vol. 37, Issue 1, p. 30

Kipton J. Powell, Paul L. Brown, Robert H. Byrne, Tamás Gajda, Glenn Hefter, Ann-Kathrin Leuz, Staffan Sjöberg and Hans Wanner, Chemical Speciation of Environmentally Significant Metals, 2015, Vol.37, Issue 1, pp. 15-19

William E. Acree, Solubility of Nonsteroidal Anti-inflammatory Drugs (NSAIDs) in Neat Organic Solvents and Organic Solvent Mixtures

2014, Vol. 36, Issue 5, p. 21

Tomasz Mioduski, Cezary Gumiński and Dewen Zeng, Rare Earth Metal Fluorides in Water and Aqueous Systems, 2014, Vol. 36, Issue 4, p. 20

Marian Góral, David G. Shaw, Andrzej Maczyński, Barbara Wiśniewska-Gocłowska, and Pawel Oracz, Alcohols + hydrocarbons + water, 2014, Vol. 36, Issue 4, p. 18

Paul De Bièvre, Metrological Traceability of Measurement Results in Chemistry: basic concepts required for intercontinental communication of results,
2014, Vol. 36, Issue 4, pp. 16–17

Paul De Bièvre, Chemistry Conference for Young Scientists

2014, Vol. 36, Issue 4, p. 32

Analytical Chemistry (13-15 January 2015, Tel Aviv, Israel)

2014, Vol. 36, Issue 4, p. 34

Maria F. Camões, pH Measurement in Seawater

2014, Vol. 36, Issue 3, p. 13

Solubility Phenomena, 2014, Vol.36, Issue 2, p. 33

Roberto Marquardt et al., On the New Definition of the Mole

2013, Vol. 35, Issue 6, p. 29

Dewen Zeng, Solubility Phenomena, 2013, Vol. 35, Issue 3, pp.32-33

IUPAC Recommendations and Technical Reports published in Pure and Applied Chemistry

Kipton J. Powell, Paul L. Brown, Robert H. Byrne, Tamás Gajda, Glenn Hefter, Ann-Kathrin Leuz, Staffan Sjöberg and Hans Wanner

Chemical speciation of environmentally significant metals with inorganic ligands. Part 5: The Zn^{2+} + OH^-, Cl^-, CO_3^{2-}, SO_4^{2-}, and PO_4^{3-} systems (IUPAC Technical Report)

2013, Vol. 85, Issue 12, pp. 2249-2311

Ute Resch-Genger and Knut Rurack

Determination of the photoluminescence quantum yield of dilute dye solutions (IUPAC Technical Report)

2013, Vol. 85, Issue 10, pp. 2005-2013

Kermit K. Murray, Robert K. Boyd, Marcos N. Eberlin, G. John Langley, Liang Li and Yasuhide Naito

Definitions of terms relating to mass spectrometry (IUPAC Recommendations 2013)

2013, Vol. 85, Issue 7, pp. 1515-1609

Jörg Enderlein

Fluorescence correlation spectroscopy (IUPAC Technical Report)

2013, Vol. 85, Issue 5, pp. 999-1016

Reşat Apak, Shela Gorinstein, Volker Böhm, Karen M. Schaich, Mustafa Özyürek and Kubilay Güçlü

Methods of measurement and evaluation of natural antioxidant capacity/activity (IUPAC Technical Report)

2013, Vol. 85, Issue 5, pp. 957-998

Antonio Doménech-Carbó, Jan Labuda and Fritz Scholz

Electroanalytical chemistry for the analysis of solids: Characterization and classification (IUPAC Technical Report)

2013, Vol. 85, Issue 3, pp. 609-631

Marcel Ameloot, Martin vandeVen, A. Ulises Acuña and Bernard Valeur

Fluorescence anisotropy measurements in solution: Methods and reference materials (IUPAC Technical Report)

2013, Vol. 85, Issue 3, pp. 589-608

Current Active Projects

Project	Title	Series/ subcommittee
2005-035-2-500 Belli	Trace elements analysis: role of grain size distribution in solid reference materials	
2006-034-1-500 Clever	The solubility of oxygen in all solvents	SSED
2007-047-1-500 Sazonov	Solubility data related to industrial processes. Nitriles C+3: binary and multicomponent systems	SSED
2008-025-1-500 Filella	Humic-metal binding constants database	SSED
2009-006-1-500 Ellison	Experimental Requirements for Single-Laboratory Validation	IWHQA
2010-030-1-500 Chai	Radioanalytical Chemistry - Revision	OB

	of the Orange Book CHAPTER 16	
2010-052-1-500 Pingarron	Electroanalytical Chemistry - The Revision of the Orange Book CHAPTER 7	OB
2010-061-2-500 Malek	Using process mapping to support (analytical) laboratory processes	IWPHQA
2011-031-1-500 Voigt	Solubility of Lithium Sulfate in Aqueous Solutions	SSED
2011-043-1-500 Shaw	Solubility data related to Industrial Processes. Solubility data in ternary systems containing water, alcohol, and hydrocarbon	SSED
2011-046-1-500 Maryutina	Separation - Revision of the Orange Book CHAPTER 4	OB
2011-047-1-500 Labuda	Recent advances in bioanalytical chemistry: characterization and classification - Revision to the Orange Book CHAPTER 11	OB
2011-063-1-500 Pawliszyn	Sampling and sampling preparation - Revision of Orange Book CHAPTER 2	OB
2011-065-3-500 Bendova	Database on liquid-liquid equilibria of binary mixtures of (ionic liquids and molecular compounds)	SSED
2012-004-1-500 Gamsjager	Solubility of lead carbonates	SSED
2012-007-1-500 De Bievre	Metrology - IUPAC Orange book CHAPTER 1	OB
2012-008-1-500 Hefter	Critical Evaluation of Thermodynamic Data of Sulfate Complexes in Solution	SSED
2012-021-1-500 Kuselman	Classification and modeling human errors contributing to measurement uncertainty of chemical analytical test results	IWPHQA
2012-022-1-500 Eysseltova	Solubility in Systems with Lithium and/or Sodium Nitrates Part 2 - Sodium Nitrates	SSED
2012-030-1-500 Guminski	Rare Earth Metal (Sc, Y, Lanthanoids) Fluorides in Water and Aqueous Systems	SSED
2012-031-1-500 Shaw	Modernizing the website of the Subcommittee on Solubility and Equilibrium Data	SSED
2013-013-1-500 Camoes	pH Measurement in Seawater	pH
2013-015-1-500 Apak	Methods to evaluate the scavenging activity of antioxidants toward reactive oxygen and nitrogen species (ROS/RNS)	

2013-025-2-500 Westwood	Methods for the SI Value Assignment of the Purity of Organic Compounds for use as Primary Reference Materials and Calibrators	IWPHQA
2013-032-1-200 Van Der Veen	Guidelines for the derivation of values and uncertainties from standard atomic weight intervals	
2013-034-1-500 Gaune-Escard	Mutual Solubility of Rare Earth Metal (Sc, Y, Lanthanides) Bromides in Molten Alkali Bromides	SSED
2013-052-1-024 Kinnan	IUPAC Color Book Data Management	
2013-055-2-024 Straut	Increasing IUPAC's Social Media presence	
2014-012-2-500 Magalhaes	100 Volumes of Plenitude - Celebrating the IUPAC-NIST Solubility Data Series	SSED
2014-027-1-500 Kuselman	Guide for classification, modeling and quantification of human errors in a chemical analytical laboratory	IWPHQA
2012-005-1-500 Hibbert (continued in 2015)	Vocabulary of Concepts and Terms in Analytical Chemistry - the revised Orange Book (4th edition)	OB

Conferences and Symposia

ISRANALYTICA 2015, 14-15 January 2015 at the David Intercontinental Hotel, Tel-Aviv, Israel.
In conjunction with that major annual event, a Workshop on Human Errors and Quality of Chemical Analytical Results was organised on 13 January 2015 at the adjacent Dan Panorama Hotel by members of the IWPHQA of the Division.

International Workshop on Determining Antioxidants as Reactive Species Scavengers, Istanbul, 27 to 28 October, 2014.
The workshop was organized jointly by the Istanbul University and the Analytical Chemistry Division of IUPAC with Prof. Dr. Reşat APAK (Istanbul University), the workshop chairman.

The 16th International Symposium on Solubility Phenomena and Related Equilibrium Processes was organized by the Karlsruhe Institute of Technology, Institute for Nuclear Waste Disposal (KIT-INE), Karlsruhe Germany. This IUPAC-sponsored symposium included a workshop, organised by the SSED, entitled “Solubility and Speciation in Nuclear Waste Disposal”.

248th ACS National Meeting, San Francisco, CA – Session: The IUPAC Solubility Data Series: 100 volumes of Solubility Data Online – Wednesday, 13August, 2014. Members of SSED were responsible for the half day session “The IUPAC Solubility Data Series: 100 volumes of Solubility Data Online” that occurred on the 13th August 2014 in San Francisco, California.

International Union of Pure and Applied Chemistry
A member of the International Council of Scientific Unions
Division VI, Chemistry and the Environment
2015 Progress Report – Submitted by Laura L. McConnell, President

I. Highlights
   a. Division VI – Chemistry and the Environment, has made progress on a number of important projects over the last year and it has initiated four new projects in 2015:
      i. 2014-023-2-600 (Letcher) – Climate Change: Observed Impacts on Planet Earth, 2nd Edition. This project seeks to provide an updated Edition of the original book with new chapters and updated information in other chapters. All chapters have been reviewed and submitted to the publisher.
      ii. 2014-031-3-600 (Purchase) - The Environmental and health challenges of E-Waste and its management: an emerging 21st century global concern. This project aims to bring together global expertise to a) examine current research on the chemical nature of e-waste and its global distribution; b) evaluate its environmental and health impact of e-waste and related risk management tools and models; c) identify short-comings in present regulations and management strategies as well as future challenges; and d) develop a set of specific recommendations for management approaches that are science-based and globally informed. (http://www.degruyter.com/view/j/ci.2015.37.issue-4/ci-2015-0415/ci-2015-0415.xml?format=INT).
      iii. 2014-032-1-600 (Karpouzas) – Advances on the Assessment of Pesticides' Soil Microbial toxicity: New research and regulatory aspects in light of the recent methodological advances. Thus the project aims to review the current knowledge on soil microbial ecotoxicity of pesticides and propose a regulatory scheme on how pesticide soil microbial ecotoxicity should be assessed.
      iv. 2014-038-2-600 (Unsworth) - Global Framework for Implementing Consistent Ecological Risk Assessment of Pesticides for Sustainable Agriculture: Workshop in Chile. This project is designed to organize an Ecological Risk Assessment Workshop in Chile as part of the 4th Latin American Pesticide Residue Workshop in Chile.
   b. Division VI has partnered with CCE to organize the World Chemistry Leadership Meeting in Busan focusing on the UN Sustainable Development Goals. (http://www.degruyter.com/view/j/ci.2015.37.issue-4/ci-2015-0420/ci-2015-0420.xml?format=INT)
   c. Division VI is sponsoring an Environmental Chemistry Poster Prize at the World Chemistry Congress in Busan. Approximately 100 presenters will compete for three prizes to be presented at the closing ceremony.
   d. Organized a symposium, “Novel Molecular and Supramolecular Theory and Synthesis Approaches for Sustainable Catalysis” at the World Chemistry Congress in Busan. This symposium includes speakers funded a special international call for proposals managed by IUPAC and funded by several national funding agencies to foster multi-national cooperation in sustainable chemistry.
   e. Successfully hosted the 13th IUPAC International Congress of Pesticide Chemistry in August 2014 at the American Chemical Society National Meeting and Exposition.

www.iupac2014.org. At this Congress, presented the IUPAC International Award for Advances in Harmonized Approaches to Crop Protection Chemistry (http://www.degruyter.com/view/j/ci.2015.37.issue-4/ci-2015-0408/ci-2015-0408.xml?format=INT). Several publications are either completed or are in progress as a result of the Congress. The 14th Congress will be held in 2018 in Rio de Janeiro, Brazil.

f. As a means of consolidating activities and recruiting new members, a new Subcommittee on Chemical and Biophysical Processes in the Environment by combining two existing subcommittees. This subcommittee has held an initial conference call and has organized a satellite event on "The environmental and health challenges of E-Waste and its management: an emerging 21st century global concern" and a symposium on "Metals, metalloids and elemental speciation" at the 15th EuCheMS International Conference on Chemistry and the Environment in Leipzig, Germany.
g. Published a special issue of Pure and Applied Chemistry resulting from a symposium at the World Chemistry Congress in Istanbul (http://www.degruyter.com/view/j/pac.2014.86.issue-7/issue-files/pac.2014.86.issue-7.xml).
h. Sponsored the 4th Latin American Pesticide Residue Workshop in May 2015 in Santiago, Chile
i. Sponsoring the 3rd International Conference on Agrochemicals Protecting Crops, Health and Natural Environment, in January 2016 in Delhi, India.
j. Sponsoring the 9th World Mycotoxin Forum & XIVth International Symposium on Mycotoxins in June 2016, Winnipeg, Canada.

II. Selected Accomplishments and Outcomes in 2014 and early 2015 – Organized by IUPAC Strategic Plan
   a. *IUPAC will provide leadership as a worldwide scientific organization that objectively addresses global issues involving the chemical sciences.*
      i. The first workshop associated with the project titled "Guiding principles to facilitate a harmonized ecological risk assessment framework for nano-pesticides in the environment" (project 2012-020-3-600) was held in Europe at the University of York on 18-19 May 2013 coinciding with SETAC Europe meeting in Glasgow. The synthesis from the workshop discussions was captured in a "Perspective Article" published in April 2014 in Journal of Agriculture and Food Chemistry: dx.doi.org/10.1021/jf500232f. The workshop was jointly sponsored and organized by IUPAC and APVMA (The Australian Pesticide and Veterinary Medicines Authority). APVMA is the regulatory agency in Australia dealing with nanomaterials for applications in agriculture and veterinary medicines. (http://www.degruyter.com/view/j/ci.2014.36.issue-6/ci-2014-0617/ci-2014-0617.xml?format=INT). A second meeting and symposium "Fate, Effects and Risks of Nanopesticides" was held at the 13th IUPAC International Congress of Pesticide Chemistry.
      ii. In the project "Environmental Chemistry, Green and Sustainable Chemistry" (2012-034-1-600 Garelick), a special issue of Pure and Applied Chemistry has been published as a result of three sponsored symposia held at the World Chemistry Congress in Istanbul Turkey. The aim of the special issue is to provide a critical review of both fundamental and applied aspects of specific contaminants behavior in the environment and to aid in future risk assessment

that is based on appropriate consideration of their life cycle. (http://www.degruyter.com/view/j/pac.2014.86.issue-7/issue-files/pac.2014.86.issue-7.xml).

b. *IUPAC will foster communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing countries.*

and

IUPAC will utilize its global perspective and network to contribute to the enhancement of chemistry education, the career development of young chemical scientists, and the public appreciation of chemistry.

i. The 13th IUPAC International Congress of Pesticide Chemistry was held 10-14 August 2014, in San Francisco, USA. The Congress was organized by the AGRO Division of the American Chemical Society under the auspices of the IUPAC Division of Chemistry and the Environment (DCE). Two members of the DCE Committee served as co-organizers for the Congress, DCE President Laura McConnell and past-President Kenneth Racke. The Congress Scientific Committee was chaired by Cathleen Hapeman, AGRO Program Chair.

The theme of the Congress was “Crop, Environment, and Public Health Protection: Technologies for a Changing World”. The scientific program was organized into nine main scientific topics and 46 individual symposia. Topics ranged from discovery synthesis to environmental chemistry to residues in food to regulation. Each individual symposium included invited lectures, posters, and an interactive panel discussion or workshop discussion. More than 1000 lecture and poster presentations were included in the symposia. Each day of the Congress began with two plenary lectures that all participants attended, and the rest of the day involved nine concurrent sessions which participants could choose between. A synopsis of the meeting is available online (http://www.iupac2014.org/wp-content/uploads/2009/06/IUPAC-ACSFall14.pdf).

A total of 1216 scientists from 53 countries attended the Congress, with approximately one half originating from outside of North America. There was a strong emphasis on the participation of students and younger scientists as well as experts from scientifically emerging regions. More than 50 student travel grants were awarded and a “new investigator” award competition, open to those within 5 years of their Ph.D., generated a number of applicants from which three finalists were selected. A special graduate student luncheon was organized and included guest speakers who discussed international career opportunities.

Based on an IUPAC project grant, a world crop protection chemistry leadership workshop was organized during the first day of the Congress. This workshop focused on identifying opportunities for training the next generation of crop protection chemistry leaders for industry, government, and academia. A report outlining a set of consensus recommendations is being prepared by the DCE’s Advisory Committee on Crop Protection Chemistry. 2013-019-2 (Unsworth) - World Crop Protection Chemistry Institute: Developing Global Leaders for Research, Regulation and Stewardship in the 21st Century. (http://www.degruyter.com/view/j/ci.2015.37.issue-2/ci-2015-0244/ci-2015-0244.xml?format=INT)

ii. Quantitative Review and Analysis of Pesticide Sorption and Its Effect on Degradation in Relation to Soil and Climate Project No. 2010-018-2-600 (Chen): This project while still underway has generated an ACS Symposium Series Book in 2014, "Non-First Order Degradation and Time-Dependent Sorption of Organic Chemicals in Soil" (http://pubs.acs.org/isbn/9780841229785).

III. Other Substantive Information

i. The annual meeting of the division was held in San Francisco, California, August 8-9 in conjunction with the IUPAC Congress of Pesticide Chemistry. Present were 9 division members and 4 guests.

ii. A divisional conference call was held on January 28, 2015 with 19 division members and 3 additional members participating.

IV. List of Publications

a. Arancon, R. A. D., Tao Zhang, Y., & Luque, R. (2014). Nanotechnology management for a safer work environment. Pure and Applied Chemistry, 86(7), 1159-1168.

b. Ambrus, A. International Harmonization of Food Safety Assessment of Pesticide Residues. Journal of Agriculture and Food Chemistry, Article ASAP. DOI: 10.1021/jf505854w

c. Ambrus, A. Global harmonization of maximum residue limits (MRLs) for pesticides. Journal of Agriculture and Food Chemistry, Article ASAP. http://dx.doi.org/10.1021/jf505347z

d. Berenbaum, M.R. Does the Honey Bee "Risk Cup" Runneth Over? Estimating Aggregate Exposures for Assessing Pesticide Risks to Honey Bees in Agroecosystems. Journal of Agriculture and Food Chemistry, Article ASAP. http://pubs.acs.org/doi/pdfplus/10.1021/acs.jafc.5b01067.

e. Chalkiadaki, O., Dassenakis, M., Paraskevopoulou, V., & Lydakis-Simantiris, N. (2014). Experimental study of cadmium bioaccumulation in three mediterranean marine bivalve species: Correlation with selected biomarkers. Pure and Applied Chemistry, 86(7), 1189-1204.

f. Chen, W., Sabljic, A., Cryer, S. A., Kookana, R. S. (Eds.) (2014). Non-First Order Degradation and Time-Dependent Sorption of Organic Chemicals in Soil. ACS Symposium Series 1174; American Chemical Society: Washington, DC, 2014. Oxford University Press. ISBN 978-0-8412-2978-5.

g. Chen, W., Laabs, V., Kookana, R. S., Koskinen, W. C. (2014). Coupled Sorption and Degradation Kinetics and Non-First Order Behavior. In Non-First Order Degradation and Time-Dependent Sorption of Organic Chemicals in Soil, pp 5-37, W. Chen, A. Sabljic, S. A. Cryer, R. S. Kookana (Eds.). ACS Symposium Series 1174; American Chemical Society: Washington, DC, 2014. Oxford University Press. ISBN 978-0-8412-2978-5.

h. Farenhorst, A., McQueen, R., Kookana, R. S., Singh, B., Malley, D. (2014). Spatial Variability of Pesticide Sorption: Measurements and Integration to Pesticide Fate Models. In Non-First Order Degradation and Time-Dependent Sorption of Organic Chemicals in Soil (pp 255-274), W. Chen, A. Sabljic, S. A. Cryer, R. S. Kookana (Eds.). ACS Symposium Series 1174; American Chemical Society: Washington, DC, 2014. Oxford University Press. ISBN 978-0-8412-2978-5.

i. Farrukh, A., Akram, A., Ghaffar, A., Tuncel, E., Oluz, Z., Duran, H., . . . Yameen, B. (2014). Surface-functionalized silica gel adsorbents for efficient remediation of cationic dyes. Pure and Applied Chemistry, 86(7), 177-1188.
j. Fedotov, P. S. (2014). Estimating the bioavailability of trace metals/ metalloids and persistent organic substances in terrestrial environments: Challenges and need for multidisciplinary approaches. Pure and Applied Chemistry, 86(7), 1085-1095.
k. Garelick, H., Miller, B., & Peijnenburg, W. (2014). 44th IUPAC congress: Environmental chemistry. Pure and Applied Chemistry, 86(7), 1083-1084.
l. Kookana, R.S.; Boxall, A.B.A. ; Reeves, P.T., Ashauer, R. , Beulke, S., Chaudhry, Q. , Cornelis, G. , Fernandes, T.F., Gan, J. , Kah, M. , Lynch, I. , Ranville, J. , Sinclair, C. , Spurgeon, D. , Tiede, K., , Van den Brink, P.J. (2014). Nanopesticides: Guiding principles for regulatory evaluation of environmental risk. Journal of Agricultural and Food Chemistry, 62: 4227-4240. DOI: 10.1021/jf500232f
m. Kookana, R. S., Ahmad, R., Farenhorst, A. (2014). Sorption of Pesticides and its Dependence on Soil Properties: Chemometrics Approach for Estimating Sorption. In Non-First Order Degradation and Time-Dependent Sorption of Organic Chemicals in Soil, pp 221-240, W. Chen, A. Sabljic, S. A. Cryer, R. S. Kookana (Eds.). ACS Symposium Series 1174; American Chemical Society: Washington, DC, 2014. Oxford University Press. ISBN 978-0-8412-2978-5.
n. Kustov, L. M., Al-Abed, S. R., Virkutyte, J., Kirichenko, O. A., Shuvalova, E. V., Kapustin, G. I., . . . Finashina, E. D. (2014). Novel fe-Pd/SiO2 catalytic materials for degradation of chlorinated organic compounds in water. Pure and Applied Chemistry, 86(7), 1141-1158.
o. Lawrence, G. D., Patel, K. S., & Nusbaum, A. (2014). Uranium toxicity and chelation therapy. Pure and Applied Chemistry, 86(7), 1105-1110.
p. Li, J., Zhang, Y., Herjavić, G., Wine, P. H., & Klasinc, L. (2014). Bibliometric analysis of research on secondary organic aerosols: Update. Pure and Applied Chemistry, 86(7), 1169-1175.
q. Liu, C., Guan, A., Yang, J., Chai, B., Li, M., Li, H., Yang, J., Xie, Y. Efficient Approach To Discover Novel Agrochemical Candidates: Intermediate Derivatization Method. Journal of Agriculture and Food Chemistry, Article ASAP. DOI: 10.1021/jf5054707.
r. Nick, S. T., Bolandi, A., Samuels, T. A., & Obare, S. O. (2014). Advances in understanding the transformation of engineered nanoparticles in the environment. Pure and Applied Chemistry, 86(7), 1129-1140.
s. Leonardo Pantoja Munoz, Diane Purchase, Huw Jones, Jorg Feldmann and Hemda Garelick (2014). Enhanced determination of As-phytochelatin complexes in Chlorella vulgaris using focused sonication for extraction of water-soluble species. Anal. Methods, 2014, 6 (3), 791 – 797.
t. Rüdel H*, Díaz Muñiz C, Garelick H, Kandile NG, Miller BW, Pantoja Munoz L, Peijnenburg WJGM, Purchase D, Shevah Y, van Sprang P, Vijver M, Vink JPO(2015). Consideration of the bioavailability of metal/metalloid species in freshwaters: experiences regarding the implementation of biotic ligand model-based approaches in risk assessment frameworks, Accepted for publication in Environmental Science and Pollution Research. Published online: 08 March 2015. DOI 10.1007/s11356-015-4257-5.
u. Sabljic, A., Nakagawa, Y. (2014). Biodegradation and Quantitative Structure-Activity Relationship (QSAR). In Non-First Order Degradation and Time-Dependent Sorption of Organic Chemicals in Soil, pp 57-84, W. Chen, A. Sabljic, S. A. Cryer, R. S.

Kookana (Eds.). ACS Symposium Series 1174; American Chemical Society: Washington, DC, 2014. Oxford University Press. ISBN 978-0-8412-2978-5.

v. Sabljic, A., Nakagawa, Y. (2014). Sorption and Quantitative Structure-Activity Relationship (QSAR). In Non-First Order Degradation and Time-Dependent Sorption of Organic Chemicals in Soil, pp 85-118, W. Chen, A. Sabljic, S. A. Cryer, R. S. Kookana (Eds.). ACS Symposium Series 1174; American Chemical Society: Washington, DC, 2014. Oxford University Press. ISBN 978-0-8412-2978-5.
w. Shevah, Y. (2014). Water scarcity, water reuse, and environmental safety. Pure and Applied Chemistry, 86(7), 1205-1214.
x. Stankovic, S., Tanaskovski, B., Zlatic, B., Arsenovic, M., & Pezo, L. (2014). Analysis of trace elements in surface sediments, mussels, seagrass and seawater along the southeastern adriatic coast -a chemometric approach. Pure and Applied Chemistry, 86(7), 1111-1127.
y. Sur, R. (2014). Terrestrial Field Degradation Based on Soil, Climatic, and Geographic Factors. In Non-First Order Degradation and Time-Dependent Sorption of Organic Chemicals in Soil, pp 39-56, W. Chen, A. Sabljic, S. A. Cryer, R. S. Kookana (Eds.). ACS Symposium Series 1174; American Chemical Society: Washington, DC, 2014. Oxford University Press. ISBN 978-0-8412-2978-5.
z. Tepavitcharova, S., Rabadjieva, D., Todorov, T., Kovacheva, A., Dassenakis, M., & Paraskevopoulou, V. (2014). Chemical speciation in fresh, saline and hyper-saline waters. Pure and Applied Chemistry, 86(7), 1097-1101.
aa. Unsworth, J.B., Corsi, C., Van Emon, J.M., Farenhorst, A., Hamilton, D.J., Howard, C.J., Hunter, R., Jenkins, J., Kleter, G.A., Kookana, R.S. Developing Global Leaders for Research, Regulation, and Stewardship of Crop Protection Chemistry in the 21st Century. Journal of Agriculture and Food Chemistry, Article ASAP, http://pubs.acs.org/doi/pdfplus/10.1021/jf5060744.
bb. Wang Xiaonan, He Xiongkui, Andreas. Herbst, et al. Development and performance test of spray drift test system for sprayer with bar[J]. Transactions of the Chinese Society of Agricultural Engineering, 2014, 30(18): 55-62.
cc. Zhang Wenjun, He Xiongkui, Song Jianli, et al. Effect of adjuvant S240 on atomization of water dispersible granule and emulsion solution[J]. Transactions of the Chinese Society of Agricultural Engineering, 2014, 30(11): 61-67.
dd. Ziska, L.H., McConnell, L.L. Climate Change, Carbon Dioxide, and Pest Biology: Monitor, Mitigate, Manage. Journal of Agriculture and Food Chemistry, Article ASAP, DOI: 10.1021/jf506101h

Report to Bureau/Council 2015

Chemistry and Human Health Division

I. Executive Summary

Division VII is composed of three different subcommittees, each with their own goals and objectives, accomplished through their project activities.

The **Drug Discovery and Development (DDD)** subcommittee is focused on providing information and tools that can be utilized by medicinal chemists in their research activities directed toward new disease treatments. The project outputs have been directed toward reference books for drug discovery, glossaries of terms used by medicinal chemists, and short courses on medicinal chemistry in venues outside the US and Europe.

The **Toxicology and Risk Assessment (TRA)** subcommittee has projects that are concerned with the possible risk of chemical agents on human health. To help in the understanding of these risks, it has produced glossaries of terms, explanatory dictionaries, and books on concepts in toxicology. As medical practice expands beyond the use of small organic molecules in the treatment of diseases, the subcommittee has produced papers describing immunochemistry and nanomaterials in human health applications. A project supported by WHO has produced learning material for teaching young schoolchildren about hazardous chemicals used in agricultural-based countries.

The mission of the subcommittee **Nomenclature for Properties and Units (NPU)** is to ensure that in clinical chemistry and laboratory medicine, there is a common understanding of what is being measured in a biological system, and how the results will be expressed. In collaboration with the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC), it is developing a terminology for properties and units in clinical laboratories of a number of countries, particularly in Scandinavia. Future goals are to harmonize the NPU terminology with that of other clinical chemistry organizations throughout the world.

II. Project Activities

Drug Discovery and Development

Successful projects conducted this past year have continued to provide courses on medicinal chemistry to universities in countries around the world.

Project 2014-022-1-700. Highlights in Medicinal Chemistry. In January 26-30, 2015, a weeklong course was conducted at the University of Rio de Janeiro in Brazil. This was part of a summer school program for post-graduate students conducted by Prof. Eliezer Barreiro and organized by Janos Fischer. The course was funded by a joint program between IUPAC and ACS Medicinal Chemistry Division, and utilized speakers from both organizations.

Project 2014-011-2-700. Medicinal Chemistry, India. In February 9-13, 2015, a weeklong course was conducted at Sri Ramachandra University in Chennai, India. The course was a joint project with the ACS Medicinal Chemistry Division, and received partial funding from the Indian local government. Attendees were from both academia and industry, and speakers included local faculty along with those from universities and pharmaceutical companies in the US. This was the second course conducted in Chennai, and plans are to move the next one to another location.

Project 2013-016-1-700. Following the successful series of books on Analog-based Drug Discovery, a new series was initiated on Successful Drug Discovery. The first volume was published in March, 2015 by Wiley, and included 25 authors from Germany, Hungary, Japan, UK and USA. A second volume is already in the planning stage.

Project 2014-019-1-700. Emerging Problem of Novel Psychoactive Substances. A new project was initiated to critically review the current status of novel psychoactive substances which are appearing on the illicit drug market. The hope is that the results will provide useful information to scientific, social and governmental bodies in dealing with the growing problem.

Project 2010-057-3-700. This project, which is an updated Glossary of Terms used in Computational Drug Design, has been completed and is in the final stage of editing before publication in PAC and other journals.

The 2014 IUPAC Richter Prize was awarded to Helmut Buschmann of Germany at the EFMC International Symposium for Medicinal Chemistry in Lisbon, Portugal, August 2014. He was recognized for his work that discovered and developed the novel analgesic drug, tapentadol.

At the same meeting, Robin Ganellin was presented a plaque for being named an Emeritus Fellow for his over 20 years of service to the Division. Besides being a participant on many projects, he was the first Chair of the Medicinal Chemistry and Drug Development subcommittee for over ten years.

Toxicology and Risk Assessment

Project 2010-51-1-700. This project on Advances in Immunochemistry and Application in Human Health led to a series of papers on the structural aspects and molecular recognition of the immune system, and the diagnostic and therapeutic applications of antibodies. These papers were published recently in an entire volume of Pure and Applied Chemistry, 2014, Volume 86, Issue 10.

Project 2013-001-2-700. This project involved developing a Glossary of Terms used in Neurotoxicology and Reproductive /Developmental Toxicology. It was subsequently divided into two glossaries, and the one for neurotoxicology is complete and will be published in a future issue of PAC. The second glossary, (Project 2014-041-1-700) focusing on reproductive/developmental toxicology is in final stages of development.

Project 2013-007-1-700. Recent Advances in Nanoparticles and Colloidal Systems and their Impact on Human Health. This is a joint project with Division V to develop a document critically discussing colloidal and nanoparticle systems used for human health applications, such as drug delivery, in vivo imaging, food technology and cosmetics. The manuscript is planned for publication in PAC later in 2015.

Project 2014-013-1-700. Nanomaterials and Human Health: The Trends and Future. This was a two day workshop in September 15-16, 2014 held at the University of Kent in the UK to discuss nanotechnology methods and concepts based on polymers, lipids, conjugates, etc. as delivery systems for human health applications. It was attended by participants from nine countries in Europe. The workshop provided financial support and an opportunity for young scientists to show their contributions in the field.

The previously successful project, Toxicology in the Classroom (Toxiclaro) is a multimedia resource to help teachers educate their students about the dangers of pesticides on human health in agriculture-based countries. It is available in a CD format, and a printed version to assist teaching in schools where access to computers and audio-visual equipment is limited. A description of this project appeared in Chemistry International, Volume 36, No. 5 18-19 (2014). A follow-up project, 2013-023-1-700, has begun, which will expand the student's understanding of chemical risks to human health and the environment.

In 2014, the Emeritus Fellow award was bestowed on Doug Templeton for his 25 years of contributions to IUPAC , including projects, technical reports and recommendations. He was President of Division VII, 2008-2011.

Nomenclature for Properties and Units

A major step was taken early in 2014 when an agreement was reached between IUPAC, IFCC and the Danish National eHealth Authority, the three organizations that have been collaborating on the development of terminology used in clinical chemistry and laboratory medicine. A Steering Committee was established with representatives from IUPAC, IFCC and the DeHA, in order to manage the governance, operation, development and promotion of the NPU terminology. With this agreement and Steering Committee in place, future projects can work toward the widespread adoption and application of the NPU, and to align it with other international healthcare terminology. It is currently being used in Denmark, Sweden and Norway.

Project 2009-005-1-700. Demonstration of NPU-SNOMED CT Mapping/Harmonization of Terms Used in Clinical Laboratory Sciences . This was a pilot project to demonstrate the feasibility of harmonizing the NPU terminology with the internationally owned and developed clinical reference terminology, SNOMED CT. It was started before the Steering Committee was established but showed that harmonization was achievable.

Project 2014-017-1-700. Piloting NPU-SNOMED CT Mapping. This project will continue the harmonization of NPU – SNOMED CT terminologies by selecting a subset of terms to be mapped, and to develop a practical method for meeting quality criteria which can be applied between terminology developers.

Project 2007-033-3-700. Silver Book Revision. This project was undertaken as an update of the Silver Book (Compendium of Terminology and Nomenclature of Properties in Clinical Laboratory Sciences). The revision has now been completed, and a new chapter on terminology of nominal properties has been added. The Silver Book 2014 will be published this year as both printed and electronic versions.

Thomas J. Perun, President Division VII

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3 July, 2015

Report to IUPAC Council on Division VIII Activities

It is a pleasure for me to report that the Division of Chemical Nomenclature and Structure Representation is supporting numerous projects and activities in our area of responsibility – Chemical Nomenclature, one of the core IUPAC activities, and probably the one which is most frequently associated with IUPAC.

Details on active projects can be found at http://www.iupac.org/nc/home/projects/projects-by-divisions/project-list-for-division.html?tx_wfqbe_pi1%5Bdivision%5D=Chemical%20Nomenclature%20and%20Structure%20Representation%20Division. Unfortunately this page is not always up to date and, more importantly, does not include nomenclature projects which have been assigned project numbers related to other divisions. Members of Division VIII have also been involved in projects administered through the Inorganic Chemistry Division, Organic and Biomolecular Chemistry Division, and Polymer Division, as well as the IUBMB-IUPAC Joint Commission on Biochemical Nomenclature (JCBN). The level of collaboration with other Divisions is both pleasing and functionally important (3 Division Committee members are also members of the Subcommittee on Polymer Terminology and 3 Division Committee members, besides the JCBN Chairman who is *ex officio* a member of our Division, are also Associate Members of JCBN), as work on nomenclature must necessarily progress through interactions of nomenclature specialists with discipline specialists. Division VIII looks forward to further cross-fertilisation of ideas and activities through these interactions.

Key project work includes further development of the International Chemical Identifier (InChI) and Preferred IUPAC Names (PINs). The Division has also been developing closer contacts with organisations which are or will be users of chemical nomenclature. Links with the International Organisation for Standardisation (ISO) resulted in a new project on developing nomenclature for carbon nanotubes and related nanomaterials. A scoping meeting earlier this year made it clear that also a collaboration on metal clusters is highly desirable.

The Division also operates an Advisory Subcommittee which we use as a way of communicating with our community of interest, in particular in relation to review of nomenclature proposals.

In the area of nomenclature, perhaps more than in others, we need to work hard to identify and fill with enthusiasm those with more than a spark of interest in the subject. This became particularly obvious when reviewing the few received nominations for the last TM elections. We welcome any suggestions and constructive comments on this issue.

Current Division Committee Membership

Dr. Karl-Heinz Hellwich (President)
Prof. Richard M. Hartshorn (Past President)
Dr. Ture Damhus (Secretary)
Titular Members: Dr. Michael A. Beckett, Prof. Philip Hodge, Prof. Alan T. Hutton, Prof. Risto S. Laitinen, Prof. Ebbe Nordlander, Prof. Amélia P. Rauter, Dr. Hinnerk Rey (Titular Members)
Dr. Kirill Degtyarenko, Prof. Md. Abul Hashem, Dr. Michelle M. Rogers, Dr. John B. Todd, Prof. Jiří Vohlídal, Dr. Andrey Yerin (Associate Members)
Prof. Vefa Ahsen, Prof. Dong Joon Choo, Dr. Gernot A. Eller, Prof. Wei Huang, Prof. Todd L. Lowary, Prof. József Nagy, Prof. Martin Putala, Mrs. Sumalee Tangpitayakul, Prof. Lidija Varga-Defterdarović (National Representatives)
Dr. Gerard P. Moss (Ex officio)

Division Elections

Election of officers and TMs for the 2016 – 2017 biennium has been completed. This process took rather longer than planned, partly because of delayed receipt of NAO nominations, technical problems with the submitted files and, in addition, inappropriate and incomplete nominations.
The Division VIII membership for the 2016 – 2017 biennium which will be submitted to the IUPAC Council for approval includes:
Dr. Karl-Heinz Hellwich (President)
Prof. Alan T. Hutton (Vice President)
Prof. Risto S. Laitinen (Secretary)
Prof. Osman Achmatowicz, Dr. Ture Damhus, Dr. Gernot A. Eller, Prof. Richard M. Hartshorn, Prof. Philip Hodge, Dr. John B. Todd, Prof. Jiří Vohlídal (Titular Members).
Dr. Michael A. Beckett, Dr. Michelle M. Rogers (Associate Members)
Dr. Andrey Yerin (National Representatives)
Dr. Gerard P. Moss (Ex officio)
We have yet to fill four Associate Member vacancies, and only when this has been done we will be able to appoint National Representatives (NRs) because NRs can come only from countries not already represented on the Division Committee. This means that their appointment has to wait until all other vacancies have been filled. However, given the low number of nominations we will not be able to fill all available NR positions.

Key Projects for 2014-2015

After the publication of the new Blue Book with some 1600 pages we look forward to completing the Brief Guides to the Nomenclature of Inorganic and Organic Chemistry in the near future.

The new Blue Book, *Nomenclature of Organic Chemistry, IUPAC Recommendations and Preferred Names 2013* was completed by Warren Powell with the help of a few Division Committee members and it was published right before Christmas 2013.

Unfortunately, there have already been a number of inconsistencies detected in the new Blue Book, so that we are currently trying to establish procedures for their solution and suitable publication as well as ways of communication in this context and last but not least measures in order to prevent similar situations for future projects. In the meantime the list of errata has reached the length of over 900 entries and we are looking for a suitable way of publication. The preparation of a corrected PDF of the book is intended. We have been in contact with the chair of ICTNS (Interdivisional Committee of Terminology, Nomenclature and Symbols) and

the IUPAC Secretariat in order to prevent similar situations for future projects. In addition to errors and inconsistencies which can be handled as errata we also identified some issues which require further study for which we intend to initiate a project potentially leading to a revised edition of this book.

We also anticipate significant progress being made on developing Preferred Names for inorganic compounds and for polymers. The document "Specifying the Coordination of Ligands to Central Atoms: Detailed Description of Grammar in the Kappa (κ) Convention" shall be a first step in this direction. Also the document "Preferred names of constitutional units for use in structure-based names of polymers" will be submitted for review before the end of this year.

Other projects nearing completion are the "Nomenclature of Flavonoids" which – after completion of public review and revision – will be resubmitted for publication soon, and the "Source-Based Nomenclature for Single-Strand Homopolymers and Copolymers" which will shortly be submitted to ICTNS via the Subcommittee on Polymer Terminology (SPT). After a long-lasting discussion over years between members of the Subcommittee on Polymer Terminology (SPT) and Division VIII on the basic approach of this document, a breakthrough was achieved only earlier this year which resulted in a new draft of the Source-based nomenclature clearly elaborating that source-based polymer names must be based on retained IUPAC names for monomers. In addition, only a limited number of frequently encountered polymer names have been included as "retained polymer names".

Three new projects have been approved after the last General Assembly by the end of the last biennium:

- Implementation of InChI for chemically modified large biomolecules (2013-010-1-800)

- Nomenclature for metallacycles containing transition metals (2013-030-1-800)

- Structure-based Nomenclature for Regular Linear, Star, Comb and Brush Polymers (2013-031-3-800)

Project Reviews and New Funding Committed

Division VIII projects approved so far in this biennium are:

2013-056-1-800	Nomenclature of carbon nanotubes and related substances
2014-001-2-200	Terminology guidelines and database issues for topology representations in coordination networks, metal-organic frameworks and other crystalline materials
2014-003-2-800	End-of-line hyphenation of systematic chemical names
2014-034-2-400	Nomenclature for polymeric carriers bearing chemical entities with specific activities and names
2015-003-2-300	Nomenclature of Homodetic Cyclic Peptides Produced from Ribosomal Precursors
2015-019-2-800	Identifying International Chemical Identifier (InChI) Enhancements – QR codes and Industry Applications

Several other project proposals are in preparation. The Division has also been developing closer contacts with organisations that are, or will be, users of nomenclature. This includes project work with the International Union of Biochemistry and Molecular Biology (IUBMB) under the auspices of the Joint Commission on Biochemical Nomenclature (JCBN), and most recently with ISO.

International Organisation for Standardisation (ISO) Liaison

Links with the International Organisation for Standardisation (ISO) resulted in one of the above new projects (2013-056-1-800). The ISO Technical Committee (TC 229) working in this area has been conducting a selection process for experts to participate in IUPAC projects, together with nomenclaturists from Division VIII. It is anticipated that another project will be initiated on the development of nomenclature for metal clusters.

Subcommittee on the IUPAC International Chemical Identifier

The Division continues to support the development of the International Chemical Identifier (InChI) – one project has been funded so far this biennium. The Sub-Committee on the IUPAC International Chemical Identifier (InChI) is the body through which IUPAC maintains oversight of the scientific activities of the InChI Trust. It reports to Division VIII and to the Committee on Publications and Cheminformatics Data Standards (CPCDS, formerly CPEP).

Budget Report

The budget allocation to Division VIII for the current biennium is USD 70,400. According to IUPAC guidelines approximately 70 % (USD 49,280) of division budgets should be committed to support project work, and the remaining 30 % (USD 21,120) allocated to operational expenditure. As in past biennia in Division VIII we envision to exceed the operational expenditure target, because operational expenditure has been and will be used to support liaison activities (e.g. with the InChI Trust, ISO, ACS) which may lead to further future projects. There are also on-going commitments to support IUPAC involvement in the long-standing IUBMB-IUPAC Joint Commission on Biochemical Nomenclature (JCBN). According to the latest data I have, operational expenditure is just under USD 16,000, while further USD 18,650 have been committed to projects. Approximately USD 35,750 remain uncommitted. A number of project proposals are being formulated at present and I fully anticipate that most of the remaining funding will be allocated to new projects.

Publications Related to Div VIII since last report

Nomenclature of Organic Chemistry, IUPAC Recommendations and Preferred Names 2013 (The Blue Book), IUPAC; W. H. Powell, H. A. Favre (Eds.) XLIII, 1568 pp., IUPAC, Royal Society of Chemistry, Cambridge, UK, 2014

J. He, J. Chen, K.-H. Hellwich, M. Hess, K. Horie, R. G. Jones, J. Kahovec, T. Kitayama, P. Kratochvíl, S. V. Meille, I. Mita, C. dos Santos, M. Vert, J. Vohlídal, Abbreviations of polymer names and guidelines for abbreviating polymer names (IUPAC Recommendations 2014), *Pure Appl. Chem.* **86**(6), 1003 – 1015 (2014)

R. G. Jones, T. Kitayama, E. S. Wilks, R. B. Fox, A. Fradet, K.-H. Hellwich, M. Hess, P. Hodge, K. Horie, J. Kahovec, P. Kratochvíl, P. Kubisa, E. Maréchal, W. Mormann, C. K. Ober, R. F. T. Stepto, M. Vert, J. Vohlídal, Nomenclature and graphic representations for chemically modified polymers (IUPAC Recommendations 2014), *Pure Appl. Chem*. **87**(3), 307 – 319 (2015); Erratum: *Pure Appl. Chem*. **87**(4), 441 (2015)

G. J. Leigh, Polymer Nomenclature, *Chem. Int*. **35**(4), 25 – 26 (2013)

G. J. Leigh, The Special Case of Boron Hydrides, *Chem. Int*. **35**(5), 24 – 25 (2013)

G. J. Leigh, Use of Abbreviations, Enclosing Marks, and Line-Breaks, *Chem. Int*. **35**(6), 24 – 25 (2013)

A. Yerin, A. McNaught, S. Heller, InChI – The IUPAC International Chemical Identifier, Current Status and Future Development in Relation to IUPAC Activities, *Chem. Int*. **35**(6), 12 – 15 (2013)

By the time of the General Assembly in Busan, hopefully also the "Brief Guide to the Nomenclature of Inorganic Chemistry" will be published. Unfortunately, since the IUPAC journal Pure and Applied Chemistry has been contracted with the publishing house De Gruyter, we have been experiencing several problems. In this particular case, for example, IUPAC recommendations which have been described and followed in the manuscript have been disregarded during typesetting which made it necessary to repeatedly request sets of proofs. For other manuscripts the authors did not receive proofs at all, which resulted in errors introduced during copyediting carried through to the final printed version, and errors found in the ASAP publication were not corrected before printing – despite notification of the editors.

(Karl-Heinz Hellwich)

President

IUPAC Division of Chemical Nomenclature and Structure Representation

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Membership - Division (I)
Physical and Biophysical Chemistry
2016 - 2017

Name	Status	Term	NAO
Dr. Angela Wilson	TM-President	2016-2017	USA
Dr. Roberto Marquardt	TM-Past President	2016-2017	France
Dr. Kristin Bartik	TM-Vice President	2016-2017	Belgium
Dr. Assaf Friedler	TM-Secretary	2014-2017	Israel
Dr. Attila G. Császár	TM	2016-2017	Hungary
Dr. Pierangelo Metrangolo	TM	2016-2017	Italy
Dr. Yun Him Taufiq-Yap	TM	2014-2017	Malaysia
Dr. Frank van Veggel	TM	2014-2017	Canada
Dr. Timothy J. Wallington	TM	2016-2017	USA
Dr. Bert Weckhuysen	TM	2016-2017	Netherlands
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	Ex Officio	2016-2017	
	10 TMs, 6 AMs, 10 NRs		

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Membership - Division (II)
Inorganic Chemistry Division
2016 - 2017

Name	Status	Term	NAO
Dr. Jan Reedijk	TM-President	2014-2017	Netherlands
Dr. Lars R. Ohrström	TM-Vice President	2014-2017	Sweden
Dr. Markku Leskelä	TM-Secretary	2012-2017	Finland
Dr. Lidia Armelao	TM	2016-2017	Italy
Dr. Tiping Ding	TM	2014-2017	China/Beijing
Dr. Pavel Karen	TM	2016-2017	Norway
Dr. Bob Loss	TM	2016-2017	Australia
Dr. Daniel Rabinovich	TM	2014-2017	USA
Dr. Thomas Walczyk	TM	2014-2017	Singapore
Dr. Michael Wieser	TM	2014-2017	Canada
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
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	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	Ex Officio	2016-2017	
	10 TMs, 6 AMs, 10 NRs		

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Membership - Division (III)
Organic and Biomolecular Chemistry
2016 - 2017

Name	Status	Term	NAO
Dr. Margaret A. Brimble	TM-President	2016-2017	New Zealand
Dr. Mary Garson	TM-Past President	2016-2017	Australia
Dr. Francesco Nicotra	TM-Vice President	2016-2017	Italy
Dr. Amelia Rauter	TM-Secretary	2016-2017	Portugal
Dr. Pher Andersson	TM	2016-2017	Sweden
Dr. Jon Clardy	TM	2016-2017	USA
Dr. Nikolay Nifantiev	TM	2014-2017	Russia
Dr. Ganesh Pandey	TM	2016-2017	India
Dr. Janet Scott	TM	2016-2017	UK
Dr. Zhen Xi	TM	2016-2017	China
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	NR	2016-2017	
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	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	Ex Officio	2016-2017	
	10 TMs, 6 AMs, 10 NRs		

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Membership - Division (IV)
Polymer
2016 - 2017

Name	Status	Term	NAO
Dr. Gregory Russell	TM-President	2016-2017	New Zealand
Dr. Michael Buback	TM-Past President	2016-2017	Germany
Dr. Christine Luscombe	TM-Vice President	2016-2017	USA
Dr. Michael Walter	TM-Secretary	2016-2019	USA
Dr. Sabine Beuermann	TM	2014-2017	Germany
Dr. Jiasong He	TM	2014-2017	China
Dr. Igor Lacik	TM	2016-2017	Slovakia
Dr. Mitsuo Sawamoto	TM	2014-2017	Japan
Dr. Natalie Stingelin	TM	2016-2017	UK
Dr. Yusuf Yagci	TM	2016-2017	Turkey
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	NR	2016-2017	
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	NR	2016-2017	
	NR	2016-2017	
	Ex Officio	2016-2017	
	10 TMs, 6 AMs, 10 NRs		

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Membership - Division (V)
Analytical Chemistry
2016 - 2017

Name	Status	Term	NAO
Dr. Jan Labuda	TM-President	2016-2017	Slovakia
Dr. Brynn Hibbert	TM-Past President	2016-2017	Australia
Dr. Zoltan Mester	TM-Vice President	2016-2017	Canada
Dr. Attila Felinger	TM-Secretary	2016-2017	Hungary
Dr. Derek Craston	TM	2016-2017	UK
Dr. Tatiana Maryutina	TM	2016-2017	Russia
Dr. Sandra Rondinini	TM	2016-2017	Italy
Dr. David G. Shaw	TM	2016-2017	USA
Dr. Heli M. M. Sirén	TM	2016-2017	Finland
Dr. Takae Takeuchi	TM	2016-2017	Japan
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
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	NR	2016-2017	
	NR	2016-2017	
	Ex Officio	2016-2017	
	10 TMs, 6 AMs, 10 NRs		

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Membership - Division (VI)
Chemistry and the Environment
2016 - 2017

Name	Status	Term	NAO
Dr. Petr Fedotov	TM-President	2016-2017	Russia
Dr. Laura McConnell	TM-Past President	2016-2017	USA
Dr. Rai Kookana	TM-Vice President	2016-2017	Australia
Dr. Hemda Garelick	TM-Secretary	2014-2017	UK
Dr. Manos Dassenakis	TM	2014-2017	Greece
Dr. Philippe Garrigues	TM	2014-2017	France
Dr. Irina Perminova	TM	2016-2017	Russia
Dr. Heinz Rüdel	TM	2014-2017	Germany
Dr. John B. Unsworth	TM	2014-2017	UK
Dr. Baoshan Xing	TM	2014-2017	USA
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	NR	2016-2017	
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	NR	2016-2017	
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	NR	2016-2017	
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	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	Ex Officio	2016-2017	
	10 TMs, 6 AMs, 10 NRs		

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Membership - Division (VII)
Chemistry and Human Health
2016 - 2017

Name	Status	Term	NAO
Dr. Thomas Perun	TM-President	2014-2017	USA
Dr. Rita Cornelis	TM-Vice President	2014-2017	Belgium
Dr. Michael Schwenk	TM-Secretary	2010-2017	Germany
Dr. Vincenzo Abbate	TM	2016-2017	Italy
Dr. Edmond Differding	TM	2014-2017	Belgium
Dr. Arun Ganesan	TM	2016-2017	UK
Dr. Vladimir Gubala	TM	2014-2017	Slovakia/UK
Dr. Linda Johnston	TM	2014-2017	Canada
Dr. Helle Møller Johannesen	TM	2014-2017	Denmark
	TM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	Ex Officio	2016-2017	
	10 TMs, 6 AMs, 10 NRs		

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Membership - Division (VIII)
Chemical Nomenclature and Structure Representation
2016 - 2017

Name	Status	Term	NAO
Dr. Karl-Heinz Hellwich	TM-President	2014-2017	USA
Dr. Alan Hutton	TM-Vice President	2016-2017	South Africa
Dr. Risto Laitinen	TM-Secretary	2016-2017	Finland
Dr. Osman Achmatowicz	TM	2016-2017	Poland
Dr. Ture Damhus	TM	2016-2017	Denmark
Dr. Gernot Eller	TM	2016-2017	Austria
Dr. Richard Hartshorn	TM	2016-2017	New Zealand
Dr. Philip Hodge	TM	2014-2017	UK
Dr. John B. Todd	TM	2016-2017	USA
Dr. Jiří Vohlídal	TM	2016-2017	Czech Republic
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	AM	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	NR	2016-2017	
	Ex Officio	2016-2017	
	10 TMs, 6 AMs, 10 NRs		

48th IUPAC Council Meeting

Busan, Korea, 12-13 August 2015

Election of Officers and Bureau Members

According to IUPAC statutes, Council must elect officers of the Union and elected members of the Bureau. Nominations for the various positions that fall vacant at the end of 2015 had to be received by the Secretary General at the IUPAC Secretariat before 20 June 2015 (i.e., two months before the start of the Council meeting).

Professor Natalia Tarasova (Russia), Vice President and President-Elect will be president on 1 January 2016. The Vice President to be elected will be President-Elect on 1 January 2016 and will become President on 1 January 2018. The retiring President, Mark Cesa (USA), will remain an officer and a member of the Bureau for a period of two years. Acting Secretary General Colin Humphris (UK) will retire after completing his appointment. Treasurer John Corish (Ireland) will retire after completing two terms for a period of four years each.

The nominations received for **Vice President** are as follows:

- Prof. Atta-ur-Rahman (Pakistan)
- Prof. Qi-Feng Zhou (China, Beijing)

The nominations received for **Secretary General** are as follows:

- Prof. M. Iqbal Choudhary (Pakistan)
- Prof. Richard Hartshorn (New Zealand)
- Prof. Ron Weir (Canada)

The only nomination received for **Treasurer** is as follows:

- Mr. Colin Humphris (UK)

Elected Members of Bureau whose terms end in 2015 and who <u>are</u> eligible for reelection to a second four-year term:

- Prof. Christopher Brett (Portugal)

Elected Members of Bureau, retiring in 2015, who are <u>not</u> eligible for re-election, but may be nominated for another office:

- Prof. Ram Lamba (Puerto Rico)

Elected Members of the Bureau, retiring in 2015, who are not eligible for this election:

- Dr. Javier Garcia-Martinez (Spain)

Elected Members of Bureau, who were elected at the 47th Council until 2017:

- Prof. Russell Boyd (Canada)
- Prof. Tavarekere Chandrashekar (India)
- Prof. Richard Hartshorn (New Zealand)
- Mr. Colin Humphris (UK)
- Prof. Christopher Ober (USA)
- Prof. Kaoru Yamanouchi (Japan)
- Prof. Qu-Feng Zhou (China)

At least three Elected Members of the Bureau must be elected at the 48th Council in Busan, Korea, i.e., the minimum number of ten Elected Members (Statute 7.2) less the seven Elected Members who continue in office until 2013.

The nominations received for **Elected Members of the Bureau** are as follows:

- Prof. Christo Belarew (Bulgaria)
- Prof. Christopher M. A. Brett (Portugal)
- Prof. Mei Hung Chui (China Taipei)
- Prof. Hemda Garelick (UK)
- Prof. Ehud Keinan (Israel)
- Dr. Kew-Ho Lee (Korea)
- Dr. Patrick Moyna (Uruguay)
- Dr. Carlos Tollinche (Puerto Rico)
- Prof. Pietro Tundo (Italy)

Candidates for Vice President and Secretary General had the opportunity to provide a statement regarding their plans if they are elected, describing their goals and objectives. These statements are included in the Agenda Book.

Vice President Candidates

Prof. Atta-ur-Rahman
(Pakistan)

Prof. Qi-Feng Zhou
(China, Beijing)

Secretary General Candidates

Prof. M. Iqbal Choudhary
(Pakistan)

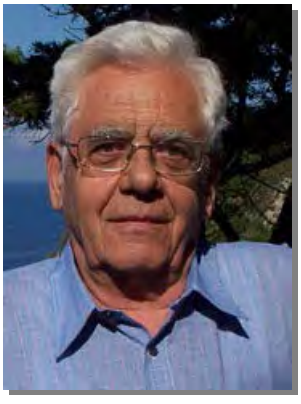
Prof. Richard Hartshorn
(New Zealand)

Prof. Ron Weir
(Canada)

Treasurer Candidate

Mr. Colin Humphris (UK)

Candidates as Elected Members of the Bureau

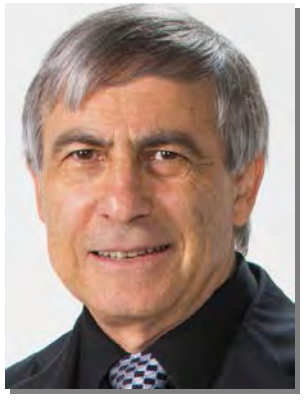


Prof. Christo Belarew
(Bulgaria)

Prof. Christopher M.A. Brett (Portugal)

Prof. Mei-Hung Chui
(China, Taipei)

Prof. Hemda Garelick
(UK)



Prof. Ehud Keinan
(Israel)

Dr. Kew-Ho Lee
(Korea)

Dr. Patrick Moyna
(Uruguay)

Dr. Carlos Tollinche
(Puerto Rico)

Prof. Pietro Tundo
(Italy)

PROF. ATTA-UR-RAHMAN, FRS

UNESCO Science Laureate

President Network of Academies of Science in Countries of the Organization of Islamic Conference (NASIC)

, Professor Emeritus, International Centre for Chemical & Biological Sciences, University of Karachi, Karachi 75270, Pakistan email: aurahman786@gmail.com

Prof. Atta-ur-Rahman obtained his Ph.D. in organic chemistry from Cambridge University (1968). He has 985 publications in several fields of organic chemistry including 723 research publications, 37 international patents, 68 chapters in books and, 156 books published largely by major U.S. and European presses. He is the Editor-in-Chief of eight European Chemistry journals (Current Medicinal Chemistry I.F. 3.715, Mini-Reviews in Medicinal Chemistry I.F. 3.186, Current Organic Chemistry I.F. 2.537, Current Nanoscience I.F. 1.422, Medicinal Chemistry I.F. 1.387, Letters in Drug Design & Discovery I.F. 0.961, Mini-Reviews in Organic Chemistry I.F. 0.826, Current Pharmaceutical Analysis I.F. 0.771). He is Editor of the world's leading encyclopedic series of volumes on natural products "*Studies in Natural Product Chemistry*" 46

during the last two decades. Eighty two students have completed their Ph.D. degrees under his supervision.

Prof. Rahman is the first scientist from the Muslim world to have won the prestigious UNESCO Science Prize (1999) in the 35 year old history of the Prize. He was elected as Fellow of Royal Society (London) in July 2006. He has been conferred honorary doctorate degrees by many universities including the degree of Doctor of Science (Sc.D.) by the Cambridge University (UK) (1987), Honorary degree of Doctor of Education by Coventry University UK (2007), Honorary D.Sc. degree by Bradford University (2010), Honorary Ph.D. by Asian Institute of Technology (2010) and Honorary Doctorate from King of Malaysia (University of Technology, Mara, 2011). He was elected Honorary Life Fellow of Kings College, Cambridge University, UK in 2007. Prof. Atta-ur-Rahman was conferred the TWAS (Italy) Prize for Institution Building in October 2009 in recognition of his contributions for bringing about revolutionary changes in the higher education sector in Pakistan. The Austrian government has honoured him with its highest civil award ("Grosse Goldene Ehrenzeischen am Bande") (2007) in recognition of his eminent contributions. He is President of Network of Academies of Sciences of Islamic Countries (NASIC), Foreign Fellow of Korean Academy of Sciences, and Foreign Fellow of the Chinese Chemical Society. Prof. Atta-ur-Rahman has won the International Scientific Corporation Award by Chinese Academy of Science (CAS) for building scientific collaborations between China and Pakistan (2014), has been awarded prestigious "Einstein

Professorship" by Chinese Academy of Sciences (CAS), 2013 and has been awarded highest award "Friendship Award of China" on September 28, 2014.

Prof. Atta-ur-Rahman is the President of Network of Academies of Science in Countries of the Organization of Islamic Conference (NASIC). Prof. Atta-ur-Rahman has been elected as the President of the Pakistan Academy of Sciences twice from 2003-2006 and 2011 – 2014. He was the Federal Minister for Science and Technology (14th March, 2000 – 20th November, 2002), Federal Minister of Education (2002) and Chairman of the Higher Education Commission with the status of a Federal Minister from 2002-2008. Prof. Atta-ur-Rahman was the Coordinator General of COMSTECH, an OIC Ministerial Committee comprising the 57 Ministers of Science & Technology from 57 OIC member countries from 1996 to 2012. He is Distinguished National Professor as well as Professor Emeritus at Karachi University.

In recognition of his global outstanding services to the development of Science and Technology the largest university in Malaysia, University of Technology Mara, Malaysia UiTM, has established an institution entitled, "Atta-ur-Rahman Institute of Natural Product Discovery (RiND)" in 2013., The National University of Science and Technology (NUST) has also established an Institute "Atta-ur-Rahman School of Applied Biosciences (ASAB)" at their university in Islamabad in 2011.

Prof. Dr. Atta-ur-Rahman is the most decorated scientist of Pakistan having won four civil awards by the government of Pakistan, including Tamgha-i-Imtiaz (1983), Sitara-i-Imtiaz (1991), Hilal-i-Imtiaz (1998), and the highest national civil award Nishan-i-Imtiaz (2002).

FUTURE PLANS_ PROF. ATTA-UR-RAHMAN, *FRS*

1) If elected I will try my best to help the developing world by establishing strong distance education programs. I have already made a good beginning by establishing an integrated version of MOOCs (Massive Open Online Courses) at school, college and university levels. They are free of charge and do not require registration. These are available at
   www.lej4learning.com.pk
   These will be further expanded by addition of "Future Learn" and other MOOCs and provided to the world community of scientists.
2) I have also initiated live interactive educational programs and some 4,000 lectures have been delivered in chemistry and other science disciplines interactively over the last 4 years. They are available at the website below and will be spread across the world.
   www.streaming.hec.gov.pk/tcs
3) Special emphasis will be given for the development of chemical sciences in both privileged and less privileged countries.
4) Special program will be initiated to assist chemical industries and linkages will be established between chemists in academia and industry.
5) Workshops, symposia, webinars will be arranged to develop strong channels of communication between the international community
6) The global perspective of IUPAC will be effectively utilized for the promotion of chemical education, environmental issues and socio-economic development.
7) Strategies for the popularization of chemistry amongst the common people will be adopted by linking chemistry education to daily problems such as food safety, energy, agricultural productivity and other fields.
8) The IUPAC will focus efforts as a vibrant NGO to help our young chemists in their careers and special educational and training programs will be initiated for them.
9) Efforts will be made to project the positive activities of IUPAC in the media.
10) New ways for the generation of funds will be initiated to strengthen the activities of IUPAC.
11) Collaboration with other organization like UNESCO, TWAS etc will be further strengthened
12) Special program will be initiated at the school and college levels to attract more students towards chemistry

Abbreviated Curriculum Vitae of

Qi-Feng ZHOU

Biographical sketch

Qi-Feng ZHOU was born in Hunan province, China in 1947, graduated from Peking University and became a teaching assistant of the same university in 1970. He worked there until January 1980 when he was accepted by the graduate school of the University of Massachusetts at Amherst, USA, where he was awarded a master's degree in 1981 and a PhD in 1983, majoring in polymer science and engineering.

Immediately after receiving his PhD he came back to China and returned to his post at Peking University. He is a hard-working scientist and an excellent collaborator and has been successful in both teaching and research as partly shown by the awards he obtained during the years.

He has been deeply involved in the study of liquid crystalline polymers with 200+ papers and a few books, including a textbook on liquid crystalline polymers published by World Scientific Publishing Co.

His academic contributions include the proposal and experimental verification of the concept of "Mesogen-Jacketed Liquid Crystalline Polymers" which leads to a group of novel LCPs with very interesting properties, the first observation of some perforated layer structures in liquid crystalline rod-coil block copolymers, the design and synthesis of a wide variety of mesogenic polymers without using mesogenic building blocks, the synthesis of macromolecular helix and optically active materials by using "jacket effect" in molecular designs, the discovery of the oldest synthetic thermotropic liquid crystalline polymer, and the understanding of molecular parameters controlling the monotropic-enantiotropic transition of LCPs. These findings have attracted much interest in this area and deepened the understanding of polymers and macromolecular liquid crystals.

In addition to the scientific contributions briefly cited above, he also makes great contributions as an administrator. He served as the executive dean of the Graduate School of Peking University for 6 years, and the Director General of the Office of Academic Degrees Committee of the State Council and Director General of Department of Postgraduate Education of the Ministry of Education

for 3 years (June 2001-July 2004), the president of Jilin University for 4 years (july,2004-Nov.2008) and the president of Peking University (Nov 2008-March 2013).

For **IUPAC**, He has been an Elected Member of the Bureau and Member of the Executive Committee of the Bureau (2010-2013; 2014-2017);

Degrees held

1970: Graduation Certificate, Chemistry Dept., Peking University , Beijing, China

1981: M.S., Polymer Science and Engineering, University of Massachusetts,

1983: Ph.D., Polymer Science and Engineering, UMass, Amherst, Massachusetts, USA

Professional appointments

1983: Teaching Assistant, Dept. of Chemistry, Peking University, Beijing, China

1984-1986: Lecturer, Dept. of Chemistry, Peking University, Beijing, China

1986-1990: Associate Professor, Dept. of Chemistry, Peking University, Beijing, China

1990-present: Professor, College of Chemistry, Peking University

1995-2001: Executive Dean of Graduate School, Peking University

June 2001- July 2004:

Director-General, Office of Academic Degrees Committee, the State Council, China

Director-General, Department of Postgraduate Education, Ministry of Education, China

July 2004–November 2008: President of Jilin University, China

November 2008 – March, 2013: President of Peking University, China

2008-2012 Deputy of 11th NPC (The National People's Congress of China)
2013-2017 Deputy and Member of the Standing Committee of 12th NPC

Major research accomplishments

1, The proposal and experimental verification of the concept of "Mesogen-Jacketed Liquid Crystalline Polymers" which lay the foundation of a group of novel Liquid Crystal Polymers with interesting unique properties.

2, The use of this type of polymers as molecular building blocks in structure and property designe of new materials.

3, Over 200 papers, a few books and a few patents

Awards and honours

1986: Peking University Award for Excellent Teaching

1988: Wang Bao-Yun Award of Chinese Chemical Society

1988: Fok Ying-Tong Education Foundation Award

1991: Science Advancement Award of Ministry of Education)

1997: China Natural Science Award

1999: Member of Chinese Academy of Sciences

2001: Peking University Award for Excellent Teaching

2001: Chinese Chemical Society Award for Inovation Paper on Polymer Chemistry

2007: Yang Shixian Lectureship, Nankai University , China

2010: Outstanding Contribution Award of CCS-Sinopec Group

2014: City of Beijing Award for Excellent Teaching

Honorary and other Appointments

Honorary Fellow, The Institute of Higher Education of The University of Geogia (2006-)

WISE Award for Education Juror, 2009, 2010, 2011

WISE Prize for Education Juror, 2012, 2013, 2014

(WISE is for the World Innovation Summit for Education)

Member of ICSU-China (since 2010)

Vice President of Chinese Chemical Society （since 2010 ）

Member, the Academic Degrees Committee of the State Council, China （2001-2013）

Member, National Science and Technology Awards Committee of China (since 2010)

Honorary Doctorates:

Far Eastern State Technical University, Russia (2006)

Korea University, Korea (2009)

Waseda University, Japan (2010)

Meiji University, Japan (2010)

University of Massachusetts Amherst, USA (2010)

Universty of Akrom, Ohio, USA (2010)

University of Montreal, Canada (2010)

Contact address and emails

Office of the President, Peking University, Beijing 100871, China

Phone: (86)-10-62751200 Fax: (86)-10-62751207

Email: qfzhou@pku.edu.cn

Statement by Qifeng Zhou, VP candidate

It is my honor to be nominated as a candidate for IUPAC Vice President for the years 2016-2017. I am a professor of polymer chemistry at the College of Chemistry and Molecular Engineering at Peking University for which I once served as the president for a few years. That I first knew IUPAC was some 50 years ago when I started to learn chemistry, and it was since then I have become appreciative of what IUPAC has been doing for the world of chemistry and the betterment of the human condition. I have been very fortunate and highly honored to offer my sincere services for IUPAC since 2010 as a member of its Bureau, its Executive Committee and two other committees. By doing so, I have become more and more experienced and knowledgeable about IUPAC.

I also serve as a Vice President for the Chinese Chemical Society which is a loyal member of IUPAC and have been closely working together with IUPAC. What may be worth mentioning is the theme song “Chemistry is you, Chemistry is me” we made for the IYC. I wrote the lyrics which were translated into English by Prof. Nigel Osborne who is a composer and the Reid Professor of Music at the University of Edinburgh. The song was presented in Beijing’s National Center for the Performing Arts by the Chinese Orchestra of Peking University, and later in Edinburgh by the United Choir of the University of Edinburgh.

IUPAC will be celebrating its 100th anniversary in 2019. After 100 years of development, IUPAC has become an organization of global influence and a major pole of attraction for chemists. In the past century, chemistry has not only changed the world and benefited human being in many facades, but also developed itself into the central science, according to Wikipedia, because it bridges other natural sciences like physics, geology and biology. Today we are facing challenges in food and energy security, environmental pollution, health care, and sustainable development. IUPAC is the most desirable organization to coordinate international chemists to provide chemistry solutions to the global problems. I can foresee ever increasing important role IUPAC will play in its next century. It is a time for us to make consensus with the rest of the world that advancing chemistry is essential for building a sustainable society.

In other to better fulfill our aspirations as the leading international organization on chemistry IUPAC should further strengthen the interaction and cooperation among chemists of member countries, to unite as many chemists as possible without regard to race, religion, or political philosophy, making special efforts to encourage the chemists from developing countries to play more active roles, and to attract more chemists and relevant organizations to join the IUPAC family.

Though of key importance, the image of chemistry has been spotted by chemical pollution which has become a key issue of global concern, with developing countries

facing even more severe problems. It is IUPAC's role to help the public to better understand the issue and that chemistry can help to win the challenge. As Mr. Koichiro Matsuura, the former director-general of UNESCO mentioned, "raising public awareness about chemistry is all the more important in view of the challenges of sustainable development. It is certain that chemistry will play a major role in developing alternative energy sources and in feeding the world's growing population."

The International Year of Chemistry was a great success in promoting public understanding on chemistry and in developing worldwide interest in chemistry. The IYC activities have popularized the great importance of chemistry as the "central science" and its great impact on human well-being. It is desirable for IUPAC to further carry forward and make better use of the legacy of the IYC, to strengthen data and experience sharing among chemists and to promote multidisciplinary collaborations.

More attention should also be paid to encourage the cooperation with industries. It is one of our six long-range goals that IUPAC will assist chemistry-related industry in its contribution to sustainable development, wealth creation, and improvement in the quality of life. The goal can only be achieved through close collaboration of IUPAC with industries. IUPAC has a strong tie to chemical industry and most of its highly successful programs and projects are done by cooperation with industries. The safety training program and workshops of COCI have shown how greatly IUPAC Company Associates could contribute to achieve IUPAC's goals.

It is desirable to take further measures to stabilize and to increase IUPAC's income in order to better carry out its activities. As reported by our Treasurer, two of our income streams, those from publications and from the portfolio of investments, have diminished. Valuable recommendations have been given by the Finance Committee and effective measures have been taking. Besides the close watch of expenditures more attention should be paid on fundraising guided by Statutes.

This international organization of IUPAC could be more internationalized. The number of the present NAO is 62 which is only one third of the UN member states of 193. On the other hand, the number of our Company Associates is 80 from 15 countries and these CAs are mostly from Japan (27), France (12), and Russia (11). These statistics could have suggested that there are still rooms for IUPAC to continue its internationalization. It is also desirable to work more closely with UN, UNESCO, ICSU and associated organizations.

IUPAC has been doing greatly and growing healthily. IUPAC will be better. I will continue to learn and do my best for IUPAC if you would offer me the chance. Thank you!

Colin Humphris, BSc FRSC

16, Cropthorne Drive,
Clymping, West Sussex
BN17 5GG
United Kingdom
+44 (0)1903 733848
cjhumphris@btinternet.com

Curriculum Vitae

2014/current Elected member of IUPAC Bureau (2010-17) and Executive Committee (2013 -15). Acting IUPAC Secretary General 2014-15. Responsible for the review of the Secretariat and the recruitment of a new Executive Director in 2014. Current chair of Royal Society of Chemistry IUPAC Committee), current member of RSC Environment Health and Safety committee.

2007 -2014 Secretary of the Committee for the Chemical Industry COCI (2010-13), with responsibility for developing linkages to the global industry on international issues Served as industry representative on the International Year of Chemistry Management Committee, and was responsible to the Executive Committee for the Global Water Experiment. Organised WCLMs in Turin (Chemicals regulation) and in San Juan (chemistry's contribution to the World Summit on Sustainable Development). Member of the organising committee for the WCLM in Istanbul.

Other
Consulted to Cefic and other industry groups on European issues relating to Innovation, Environment and Health, and alternatives to animals in toxicological testing. Project manager for a European project applying computational chemistry to toxicology. Member of RSC Industry and Technology Division Council (2006 -2013).

2003-2006 Executive Director European Chemical Industry Council, CEFIC (Brussels)
Responsible for developing industry programmes in research and science for environmental health and safety (LRI) and those that underpinned industry commitments to Sustainable Development including creating the highly successful SUSCHEM initiative. Represented the World Business Council for Sustainable Development on the WHO's European Environment & Health Committee.

2002 Chemicals Innovation and Growth Team, CIGT (BP/ UK Government, DTI)
Project Manager for a multi-stakeholder review of the future for the UK chemicals industry organised on behalf the UK government.

2001 BP Polyethylene Business Leader
Led BP's Low Density Polyethylene business (LDPE/LLDPE) through restructuring.

1999 – 2000 BP Business Technology Manager Polyethylene

Responsible for the worldwide sales of licenses for BP's Polyethylene process. Resolved a major intellectual property dispute with Dow.

1998 Business Unit Leader BP Specialities
Led the merger of BP and Amoco's speciality chemicals interests. Successfully divested Adibis.

1994 - 1997 Managing Director Adibis (BP Subsidiary)
Returned Adibis to profit after three years of losses and failed attempts to divest it.

1989 - 1993 Business Venture Manager for the Polyketones
Managed the business development of a new plastic for BP as part of wider responsibilities for the Specialities businesses' technology programmes.

1986 -1989 Senior Planner for Specialities Division
Planning manager in a four-man team, which managed BP's portfolio of speciality chemicals businesses (turnover $500m p.a.)

1984 -1985 Analyst BP Policy Review Unit.
Member of the 7-person team working for the BP Chairman whose job was to challenge the conventional thinking in the company and promote alternative options.

1970 -1984 Research (BP Corporate Research)
Joined BP as a BP University apprentice. Worked as a materials scientist rising to Project Leader (8 man Team) in 1982

Personal Details

British, born 2.11.51. Married with two grown up children. Hobbies are watching cricket, motorcycling, playing guitar, photography and travel. Chairman of Clymping Parish Council and of Drip Action Theatre (Arundel) Company Ltd.

BSc 1st Class Honours in Applied Chemistry (BP Sunbury/Kingston Polytechnic)
Programme for Executive Development IMEDE (now IMD – Business School) Lausanne January - March 1989
Manager of the Future Programme, JMW Consultants 1996, part of BP Senior Management Training
BP Senior Executive Modules at Harvard and Stanford 2002 and 2003.

Colin Humphris BSc FRSC - Biographical Sketch

Colin is currently Acting Secretary General IUPAC having been elected to this position by Bureau in April 2014. At the time he was a serving member of the IUPAC Bureau (second term 2014/2017) and the Executive Committee (2014/2015).

Early in 2014 he undertook a business process review of the IUPAC Secretariat which at the time had no Executive Director and was suffering a large number issues including those relating to data retrieval and the functioning of the website. This review built on earlier work and led into the process of recruitment of our new Executive Director Dr. Lynn Soby and the changes she has instigated to modernize completely secretariat processes and the availability of management information for the efficient administration of the Union.

Colin's work in this regard drew on his experience in business and business administration. He had a 33-year career in the international oil company BP, entering as a University Apprentice and graduating with a degree in Applied Chemistry. He worked initially on material science research but then broadened his career with periods in international business policy, planning and finance. He held leadership positions in business technology management for first Speciality Chemicals and then for Polyethylene process technology. He was business manager of an oil additives subsidiary of BP and later for Low Density Polyethylene. During this time he benefitted from training in business leadership and administration including programmes run at IMD Lausanne, at Stanford and at Harvard. He left BP in 2003 to represent the Chemicals Industry in Brussels where he was responsible for industry funded research programmes on health, safety and the environment (LRI) and the creation of the now well known European programme on sustainable chemistry, SUSCHEM.

He was active in IUPAC COCI for 10 years from 2003, first as a titular member and then including 4 years as COCI Secretary. He organized the WCLMs in Turin (chemical regulation) and San Juan (sustainability). He represented industry on the IYC Management Committee and was responsible to the Executive Committee for the IYC Global Water Experiment.


COUNCIL FOR NATIONAL ACADEMIC AWARDS
Colin James Humphris
GENOME
IUPAC HANDBOOK 2004-2005
PRINCIPLES OF CORPORATE FINANCE
marketing

Personal Statement
Mr Colin J Humphris BSc FRSC

Candidate for Treasurer

Our Statutes' define the role of the Treasurer as:

S6.51 *The Treasurer shall be responsible for the accounts of the Union, shall prepare a budget for approval of the Bureau and the Council, shall approve expenditures from the funds of the Union, and, subject to the approval of the Executive Committee, shall be responsible for the investment and custody of the funds of the Union. The Treasurer shall ensure that an appropriate record of all financial authorities and transactions is maintained.*

I feel my background in industry as a business manager, administrator and planner equips me well for this role. In addition I have had the advantage of acting as the Union's Secretary General since April 2014 that has given an insight into the issues the Union faces. This was a period during which we have significantly restructured the Secretariat and its administrative functions. The aim is to improve efficiency and effectiveness in support of members in all categories of membership.

From my perspective a key challenge is to secure the financial future of the Union to enable it to continue to fulfill its chosen roles in chemistry sustainably. As Professor Corish has reported, currently our finances are constrained and we will be running a small deficit in our budgets for 2016 and 2017. We have already taken steps to halt the slide in our publishing income through the agreements with De Gruyter and are taking the first steps forward with new fee bearing publishing products. We have upgraded our management accounting to improve decision making when money is tight.

Looking forward we need to consider carefully both the costs of what we do and all of our income streams. Our income is dependent on the value of our science, standards and recommendations as perceived by our various stakeholders. Most of the international agencies that depend on our standards do not contribute to the projects that underpin them. Our subscriptions for all categories of members need to be equitable and reflect the value and benefits we provide.

In four years time I want to be able to look back on a period when IUPAC was able to flourish based on secure income spent wisely in support of the work of our many volunteers and in the interest of all our members.

PROF. DR. MUHAMMAD IQBAL CHOUDHARY

Dr. M. Iqbal Choudhary is a Professor of Organic Chemistry and Director at International Center for Chemical and Biological Sciences (H. E. J. Research Institute of Chemistry and Dr. Panjwani Center for Molecular Medicine and Drug Research). He is among the most prominent scientists of Pakistan, recognized for his original contributions in the fields of natural products and bioorganic chemistry. He has written and edited 37 *books*, most of which have been published in USA and Europe. He is also the author of over 900 *research papers and chapters* in top international science journals of the West, as well as 32 US patents. The cumulative impact factor of his publications is over 1,650. This is by far the largest number of quality publications from any scientist in Pakistan. He has been among the most cited scientists of Pakistan in last five years with citations exceeding 8,400 (*h*-Index: 35). He is the *Volume Editor* of many international book series and journals. He has served as a visiting faculty in many prestigious universities of the world, including Cornell University (New York), Purdue University (Indiana), Pennsylvania State University (Pennsylvania), Scripps Institution of Oceanography (San Diego, California), The University Rhode Island (Rhode Island) and various top Universities of UK, Saudi Arabia, Malaysia, Kazakhstan and Iran. Prof. Choudhary has won several national and international awards, such as *Hilal-e-Imtiaz*, *Sitara-e-Imtiaz* and *Tamgha-e-Imtiaz* by the President of Pakistan, Pakistan Academy of Sciences Gold Medal, National Book Foundation Prize on best book and the Third World Academy of Sciences Young Scientist Prize. He received the prestigious title of "Distinguished National Professor" from the Higher Education Commission in 2004 and Meritorious Professor by the University of Karachi 2013. He is a member and fellow of many prestigious societies including Fellow of The Academy of Sciences for the Developing World, Islamic Academy of Sciences, Chemical Society of Pakistan, Royal Society of Chemistry (London) and LEAD-International. He is also the recipient of the 1st Khawarizmi International Award and Prize from the President of Islamic Republic of Iran, Economic Cooperation Organization (ECO) Award in Education by the President of Azerbaijan, and COMSTECH Award in Chemistry by the Prime Minister of Pakistan.

HIGHLIGHTS OF MAJOR ACHIEVEMENTS

- Author/Editor of 37 books, 33 of which have been published in USA and Europe.
- Author of over 900 research publications, all published in USA, Europe, and Japan (Total Impact Factor 1,650).
- Highest number of international research papers in the country in last ten years (3% of total research publications from Pakistan in all disciplines).
- Highest number of citations (8,400).
- *h*-Index (35)

AWARDS & HONORS

- Declared as the top most scientist (Number 1) among 1,650 scientists of Pakistan in all disciplines / fields of science and technology (year 2012) by the Pakistan Council for Science and Technology (Ministry of Science and Technology), Pakistan.
- **COMSTECH Award in Chemistry** by the Prime Minister of Pakistan (2010)
- Civil Award ***Hilal-e-Imtiaz*** by the President of Pakistan (2007)
- Civil Award ***Sitara-e-Imtiaz*** by the President of Pakistan (2001).
- Civil Award ***Tamgha-i-Imtiaz*** by the President of Pakistan (1999).
- First **Khwarizmi International Award and Prize** by the President of Islamic Republic of Iran (2006).
- Economic Cooperation Organization (**ECO) Award in Education** by the President of Azerbaijan (2006).

- **Doctor of Science (D. Sc.)** University of Karachi (2005).
- **Distinguished National Professor** of the Higher Education Commission (2004).
- **Meritorious Professor**, University of Karachi (Grade 22) (2013).
- **Distinguished Professor** of the COMSATS (2013).
- **Prof. Abdussalam (Nobel Laureate) Prize in Chemistry** (1989).
- **Prof. Raziuddin Siddiqui Gold Medal** of Pakistan Academy of Sciences (1992).
- **Third World Academy of Science Young (Trieste Italy) Scientists Award** (1994).
- **National Book Foundation** Prize for Best Book (1995).

FELLOWSHIPS

- Senior Fulbright Fellow at the University of California at San Diego, USA (1999).
- Fellow of the The Academy of Sciences for the Developing World (2003).
- Fellow of the Islamic Academy of Science (2003).
- Fellow of the Pakistan Academy of Sciences (2003).
- Fellow on the Royal Society of Chemistry (2004).
- Fellow of the Chemical Society of Pakistan (2001).
- Fellow of the International Union of Pure and Applied Chemistry.
- Fellow of the World Innovation Foundation (2006).
- Fellow of the LEAD-International (Leadership for Environment and Development) sponsored by the Rockefeller Foundation, USA (1998).
- Associate Member of International Union of Pure and Applied Chemistry (IUPAC) Organic and Biomolecular Chemistry Division for the term 2010-2011.
- Vice-President, Phytochemical Society of Asia.
- Organizing Secretary of the 19th IUPAC Symposium on the Chemistry of Natural Products (1994) – The largest scientific event of Pakistan.

EDITORSHIP OF INTERNATIONAL SCIENCE JOURNALS / BOOKS SERIES	**Impact Factor**
Mini Reviews in Medicinal Chemistry, Bentham Science Publishers, Amsterdam, The Netherlands.	2.53
Current Bioactive Compounds, Bentham Science Publishers, Amsterdam, The Netherlands.	0.98
The Natural Products Journal, Bentham Science Publishers, Amsterdam, The Netherlands.	
Frontiers in Natural Product Chemistry, Bentham Science Publishers, Amsterdam, The Netherlands.	
Frontiers in Drug Design and Discovery, Bentham Science Publishers, Amsterdam, The Netherlands.	
Frontiers in Medicinal Chemistry, Bentham Science Publishers, Amsterdam, The Netherlands.	
Frontiers in Anti-Infective Drug Discovery, Bentham Science Publishers, Amsterdam, The Netherlands.	
Frontiers in CNS Drug Discovery, Bentham Science Publishers, Amsterdam, The Netherlands.	

FUTURE PLANS_PROF_DR_IQBAL_CHOUDHARY

1. If elected, I will work closely with the IUPAC community to develop a new vision for the Union in changing times.

2. I will strive to develop strategies to safeguard the interests of the chemical community at governmental and non-governmental forums.

3. Special emphasis will be given to the development of chemical sciences in less privileged countries.

4. Special programs will be initiated to assist chemical industries, as well as linkages will be established between chemistry academia and industry.

5. Workshops, symposia and webinars will be amongst the key activities to develop strong communication between international chemistry communities.

6. The global perspective of IUPAC will be effectively utilized for the promotion of chemical education.

7. Strategies for the popularization of chemistry amongst general public will be adopted.

8. The IUPAC will be transformed into a vibrant NGO to help young chemists in their careers. For this purpose special programs will be initiated.

9. Efforts will be made to project various activities of the IUPAC in print and electronic media.

10. New ways for the generation of funds, and diversifying the funding sources will be worked out.

11. Partnership with other organizations like UNESCO, TWAS, OPCW, ACC, etc will be further strengthened.

12. Special programs will be initiated at the secondary school levels to attract bright young minds towards chemistry.

Richard Michael Hartshorn

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Ilam 8041
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University of Canterbury
Private Bag 4800
Christchurch, New Zealand
ph (64-3) 3642874
fax (64-3) 3642110

Citizenship: New Zealand
Great Britain.

Date of Birth: 25 February 1965

Current Positions

Associate Professor , Department of Chemistry,
Deputy Head of Department, Departments of Chemistry/Physics and Astronomy
University of Canterbury, Christchurch, New Zealand

IUPAC Activities:

Elected Member of Bureau (2014-2017)
Chair, IUPAC Evaluation Committee (2014-2015)
Past President, Division of Chemical Nomenclature and Structure Representation (2014-2015)
President, Division of Chemical Nomenclature and Structure Representation (2010-2013)
Vice President, Division of Chemical Nomenclature and Structure Representation (2007-2009)
Committee for Chemical Education (2006 - present)
Titular Member IUPAC Division of Nomenclature and Chemical Structure Representation (2004 - 2007)
New Zealand Representative to IUPAC Council 2009, 2011, 2013
IUPAC Representative to ISO TC 229 Nanotechnologies
IUPAC Representative to ICSU WDS
IUPAC Project work:

- IUPAC Strategy Group (2015)
- End-of-line hyphenation of systematic chemical names (2014-003-2-800)
- Design for International Standards for Chemistry Education (ISCE) (2013-022-2-050)
- Handling of Inorganic compounds for InChI V2 (2012-046-2-800)
- Graphical Representation Standards for Chemical Reaction Diagrams (2012-033-1-800)
- Rules for Abbreviation of Protecting Group (2011-044-1-300)
- Basic Guidelines to the Nomenclature of Organic and Inorganic Chemistry (2010-055-1-800) – Task Group Co-chair
- Preferred IUPAC Names (PINs) for Inorganic Compounds (2006-038-1-800) – Task Group Chair
- Graphical Representation Standards for Chemical Structure Diagrams Project (2003-045-3-800)

Key IUPAC Publications

- **Brief Guide to the Nomenclature of Inorganic Chemistry** R. M. Hartshorn,* K.-H. Hellwich, A. Yerin, T. Damhus, A. T. Hutton, Pure and Applied Chemistry, *in press*.
- **The Red Book**: N.G. Connelly, T.Damhus, **R.M. Hartshorn**, A.T. Hutton, "**Nomenclature of Inorganic Chemistry, IUPAC Recommendations 2005**", Royal Society of Chemistry, ISBN 0-85404-438-8. 2005
- **The Principles Revision**: G.J. Leigh, H.A. Favre, **R.M. Hartshorn**, A.T. Hutton, M. Hess, M.A. Beckett, G.P. Moss, T. Damhus, A.D. McNaught, S.R., Heller, J. Brecher, K-H Hellwich, "**Principles of Chemical Nomenclature: A Guide to IUPAC Recommendations**, 2011 Edition", Royal Society of Chemistry, Cambridge, ISBN 978-1-84973-007-5

Research Areas:

Photoactivated Cytotoxins: synthesis and study of molecules that will release a cytotoxin when triggered with light – a new approach to cancer treatment
Bioinorganic chemistry: the study of the reactivity of small biological molecules (amino acids and peptides) when they are coordinated to metal ions; preparation of functional models of enzyme systems; design and synthesis of photoactivated cytotoxins
Photochemistry: mechanistic studies on UV induced reactions of chelated amino acids, peptides and related molecules.
Coordination chemistry: synthesis of new polydentate ligands and their metal complexes.
Stereochemistry: the stereochemical consequences of wrapping polydentate ligands around metal ions (and the related problems of enumerating and distinguishing between possible isomers).

Publications: 5 books, 47 refereed journal articles, 38 other articles and 3 books edited.

Other Professional Activities:
Member of Science Alive! Trust Board (2007 -)
Member of National Science and Technology Roadshow Trust Board (2007 -), Chair (2011 -)
Chair IC08 RACI/NZIC Inorganic Chemistry Conference Committee (2007 - 2009)
Member Royal Australian Chemical Institute (1986 -)
Fellow Royal Australian Chemical Institute (2003 -)
Member New Zealand Institute of Chemistry (2001 -)

Education:

The Australian National University (1986 - 1989). Ph.D.
University of Canterbury (1983 - 1985). B.Sc.(Hons) (First Class)
Christchurch Boys' High School (1978 - 1982).

Biographical Note: Richard M. Hartshorn,

Nominee for Secretary General

There is an old saying that time flies when you are having fun. Perhaps this explains my shock when, in order to write this biographical note, I worked out that I have now been engaged in scientific research for 30 years. This rapid flight was first through my studies in New Zealand and Australia, then as a postdoctoral researcher in the United States (CalTech), and as an academic in Australia (University of Melbourne) and, for the last 20 years, in New Zealand (University of Canterbury). My role as a teacher has been particularly fulfilling, and I like to think that I am quite good at it. Others seem to think so as well, as I am one of only seven holders of the University of Canterbury Teaching Medal.

I have also been heavily involved in school and community education, through establishment of a science outreach programme at UC, and sitting on the Trust Boards for the National Science-Technology Roadshow (http://www.roadshow.org/index.php, Chair since 2011), Rutherford's Den (http://www.rutherfordsden.org.nz/, Chair since 2014), and Science Alive! (http://www.sciencealive.co.nz/).

Away from science, much of my time has been taken up with cricket. I was a New Zealand U19 cricket representative and because of that, and a cricket coaching qualification that dates from that time, I am regularly called upon to coach teams that my sons play in.

My involvement with IUPAC has been largely based in nomenclature, and dates from the late 1990s, when I was persuaded to join the group preparing a revision of the Red Book ("**Nomenclature of Inorganic Chemistry, IUPAC Recommendations 2005**", Royal Society of Chemistry, ISBN 0-85404-438-8. 2005). Since then I have been involved in numerous projects, co-authored a range of other IUPAC publications, and been a member of the Committee on Chemical Education (since 2006). I have been elected to positions of responsibility in the Division of Chemical Nomenclature and Structure Representation (Titular member 2003-2007, Vice President 2008-2009, President 2010-2013) and the Bureau (2014-17).

Statement of Intent: Richard M. Hartshorn,

Nominee for Secretary General

From the Statutes:

"S6.41 The Secretary General shall carry out the business of the Union as specified by the Council, by the Bureau, by the Executive Committee, or by the President, and be responsible for keeping its records and for the administration of the Secretariat."

Those would be my obligations. My intentions would be to make the business of the Union as productive and effective as possible. That means looking for ways to help things run smoothly and to find opportunities for improvement in the outcomes of what we do and the means by which we get there. I have a track record of doing so for the Union, even now. As President of the Division of Chemical Nomenclature and Structure Representation (Division VIII), I was a strong advocate for identifying and embracing opportunities for collaboration and cross-fertilisation between Divisions and Committees of the Union. In particular, I took steps to make better use of General Assemblies, where all of our Divisions and Committees are brought together and are therefore available for meeting with each other. Furthermore, I was deeply involved developing the streamlined election process that has been used this biennium. We no longer have to begin the election process for the next biennium before we are even a quarter of the way through the current one.

The position of Secretary General is a leadership role and my intention is to lead by example; by performing my role as efficiently and effectively as possible so that you can do yours in that way too.

ANNEX B to
1000-8 (Chem/Chem Eng)
11 Jun 2015

SHORT BIO to be used for nomination for election to IUPAC Secretary General

Name: Ron D. Weir, CD, BSc, DIC, PhD, FCIC, FEIC, FIUPAC, FRSC(UK), CChem, PEng

Ron Weir received his BSc (Chem Eng) from the University of New Brunswick (Canada) and PhD from the University of London (UK) followed by post doctorate experience at the NRC labs in Ottawa. His expertise lies in thermodynamics from near absolute zero to high temperatures as applied to engineering materials. His academic career has been at the Royal Military College of Canada, Kingston, Ontario, where officer cadets and officers in the Canadian military read for their baccalaureate, Masters' and doctorate degrees. He spent one sabbatical year at Oxford and carried out collaborative research at the U. of Michigan (Ann Arbor), U. of Colorado, and NIST (Boulder, USA).

He has published extensively in peer-reviewed journals and served as Chair or Co-Chair and organiser for 25 international conferences for science and engineering. He is currently scientific editor for Pure and Applied Chemistry (2011-15) and editor for J. Chemical Thermodynamics (1993 - to date).

Professor Weir served in several senior administrative posts at his university. These include Head of the Department of Chemistry & Chemical Engineering, Dean of Graduate Studies and VP Research.

Dr. Weir joined IUPAC as an affiliate Member in 1984. He became an Associate Member (AM) of the then I.2 Thermodynamics Commission of IUPAC from 1989-93, its Titular Member (TM) and secretary 1993-97, its Chair 1997-2001. With the re-organisation of IUPAC in 2001 that eliminated Commissions, he became President, Division of Physical & Biophysical Chemistry 2004-06 as the responsibilities of Commission I.2 were transferred within this Division I. He served as Past President Division I from 2006-08.

He was transferred to serve as Chair Project Evaluation Committee 2008-10 and then became a member of the ICTNS (Interdivisional Committee on Terminology, Nomenclature and Symbols) 2006-10 and is now its Chair for the period 2010-15.

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He was transferred to serve as Chair Project Evaluation Committee 2008-10 and then became a member of the ICTNS (Interdivisional Committee on Terminology, Nomenclature and Symbols) 2006-10 and is now its Chair for the period 2010-15.

ANNEX D to
1000-8 (Chem/Chem Eng)
11 Jun 2015

Reference: Bureau Meeting 27 May 2015, telecom 0700-1010 h

STATEMENT OF PLAN IF RDW BECOMES IUPAC Secretary General

Name: Ron D. Weir, CD, BSc, DIC, PhD, FCIC, FEIC, FIUPAC, FRSC(UK), CChem, PEng

The duties and responsibilities of the SG are defined within Statute S6.41 as follows with S6.42 defining the time period of office:

S6.41 "The Secretary General shall carry out the business of the Union as specified by the Council, by the Bureau, by the Executive Committee, or by the President, and be responsible for keeping its records and for the administration of the Secretariat."

S6.42 "S6.42 The Secretary General shall be elected for four years and be eligible for re-election up to a maximum of a further four years."

There are three items that have top priority for the new SG. In order of importance, these are the (i) IUPAC Strategic Plan, (ii) Vice-President's Critical Assessment, and (iii) examination of the Statutes and By-laws to determine whether fine tuning is required as necessitated by the significant changes within IUPAC and the secretariat over the past few years.

(i). The Strategic Plan: President Cesa identified six major areas at the Reference where focus must be placed to deal with several questions and comments as in 16 sub-categories. I have no magic answers to some of these questions as they are not new to the organisation. Critical in my view is the relevance of IUPAC to chemists in general and to young individuals in particular. What incentives can be taken to compete with or relieve the pressure on the young chemists or chemical engineers who are trying to establish themselves in their profession in order to have them direct some attention to the work of IUPAC? The SG must weigh in on these important questions and challenges to arrive at a consensus for the way ahead for the next biennium.

(ii) VP Critical Assessment: At the Reference, VP Tarasova spoke to the questions 'what can IUPAC do best and what does the clientele require?'. She reviewed some of the IUPAC history with a focus on NAOs, gender/generational distribution among members and education as priorities for IUPAC. These items fall within the more general categories outlined in the Strategic Plan. Once again, the SG must weigh in on these issues. Collaboration and consensus seeking are important strategies for me.

(iii) Examination of the Statutes and By-laws: The decision taken by several international agencies to adopt IUPAC recommended terminology, nomenclature, symbols and units for their operations and legal standing raises the profile of IUPAC and at the same time brings more responsibilities with IUPAC operations. Included among this group known to me are the UNESCO, European commission and the EU Customs Union that regulate what is imported into the EU for the outside. How do we in IUPAC expand our 'brand'? The secretariat has been reorganised recently and major changes have taken place with respect to publishing Chemistry International.

I would bring my extensive experience within and without IUPAC to help resolve these questions.

Ron Weir

Abbreviated CV of Christo Balarew

Born on June 23th, 1934 in Sofia, Bulgaria.
Present position – Emeritus Professor at the Laboratory "Salt Systems and Natural Resources", Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Sofia.

CAREER:

1957 Graduate Chemistry at the "St. Climent Ohridsky" University, Sofia
1957-59 Teacher in Chemistry at the "Christo Botev" secondary school, Sofia
1959 Appointed as Chemist at the Chemical Institute of the Bulgarian Academy of Sciences, Sofia
1967 Associated Professor and Head of the Chair of Inorganic Chemistry at the Chemistry-Technological University in the town of Burgas
1969 PhD-thesis defended in the Mining Academy in Freiberg, Germany
1973 Senior scientific collaborator at the Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Sofia
1976-77 Alexander von Humboldt Fellowship at the University of Muenster (Prof. Dr. H. Schaefer), Germany
1983 Doctor habil. (Bulgarian Academy of Sciences)
1988-2005 Professor and Head of the Inorganic Salts Research Laboratory, Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Sofia
1990 Invited Professor at the Université Claude Bernard Lyon 1, France
1991-1992 Invited Professor at the Universidad de Valladolid, Departamento de Fisica de la Materia Condensada, Cristallografia i Mineralogia, Spain
1992-1995 President of the Chemical Commission at the Higher Attestation Committee by the Council of Ministers
1993-2001 President of the National Oceanographic Committee, Bulgaria
1994-1996 Member of the Board of Managers of the Bulgarian Academy of Sciences
1997-2001 Deputy Ministe at the Ministry of Education and Science, Bulgaria
1999 - till now - President of the National Committee of Chemistry of Bulgaria for IUPAC.
2012 Invited Professor at the Institut für Anorganische Chemie, TU Bergakademie Freiberg, Germany.

PROFESSIONAL EXPERIENCE:

Publication: Over 200 publications in the scientific literature.
Patents: Author of 19 patents
Citations: above 2000.

SCIENTIFIC ACHIEVEMENTS

Some of the scientific achievements can be summarized in the following:

According to Balarew, inorganic salts are considered as ionic coordination compounds. In their crystal structures the metal ions are coordinated by anions or water molecules and in this way coordination polyhedra are formed. They are linked with one another, with other ions or water molecules through ionic (electrostatic) or hydrogen bonds. For prognosing the composition and structure of the most probable complexes, not only the geometrical factor (Pauling rules), but also the Pearson's concept of *hard* and *soft* Lewis acids and Lewis bases (HSAB) and the crystal field stabilization energy are involved. A procedure for predicting the complexes in the crystal structures was elaborated. On this basis double salts formation was explained and a theory for the isomorphous and isodimorphous co-crystallization was created. It allows theoretical calculations of the distribution coefficients of admixtures between the

crystals and the solution and of the free energy of phase transitions to be performed on the basis of solubility data.

A model for explaining the nucleation and the kinetics of crystallization of highly soluble salts was elaborated. Nucleation starts when some of the complexes existing in the solution display high activity sufficient to reach and surpass the solubility product of the crystallizing salt. These complexes or some of their directly derivable forms (e.g. those obtained by condensation) together with other ions or molecules form the crystal structure. This means that of primary importance for the crystallization process is the activity of definite species in the solution (complexes, molecules or simple hydrated ions) that are able to be incorporated directly or with minor changes into the crystal structure. The lowest critical supersaturation needed for nucleation and the highest rate of crystallization are displayed by those salts whose complexes in the solution have analogues in the crystal structure of the crystallizing salt. The knowledge of the type and composition of the species in the solution is of crucial significance for the elucidation of the ability for supersaturation and for the crystallochemical explanation of the Ostwald step rule.

The experience accumulated during these scientific studies was applied by Prof. Balarew for elaboration of technologies for production of reagent-grade chemicals, synthesis of new materials, as well as for developing methods for hydrometallurgical extraction of useful components from natural raw materials or from industrial waste products, including technologies for utilization of marine chemical resources.

IUPAC ACTIVITIES:

Prof. Balarew was National Representative and Associated Member of Commission V.8, National Representative, Associate Member and Titular Member at the Analytical Chemistry Division Committee. From 1999 till now he is President of the National Committee of Chemistry of Bulgaria for IUPAC. Prof. Balarew is coauthor of many publications in Pure and Applied Chemistry and 2 books from the Solubility Data Series. With his active participation and under his editorship the Nomenclature of Inorganic Chemistry, Recommendations of IUPAC 2005 was translated from English and adapted to the Bulgarian language. He was Chairman of the 10th ISSP International Symposium on Solubility Phenomena, sponsored by IUPAC, Varna, 22-26 July, 2002 and Chairman of the Workshop "Solubility Phenomena – Application for Enviromental Improvement", Varna, 22 – 24 July 2002. He was member of the Organizing Committees of almost all IUPAC Solubility Phenomena Symposia and member of the Editorial Boards of many IUPAC - Solubility Data Series Volumes since 1989.

AWARDS:

1969 - "Contribution to the Scientific Progress" - Award from the National Committee of Science and Technology.

1976 - Bearer of the "Distinction Medal of the Bulgarian Academy of Sciences".

1990 - Bearer of the "N. S. Kurnakov" Distinction Medal of the Russian Academy of Sciences.

1992 - Bearer of the "Distinction Medal of the University of Valladolid", Spain.
2005 - Honoured member of the Union of Scientists in Bulgaria.
2006 - Distinction Medal 1st class of the Institute of General and Inorganic Chemistry, BAS.
2009 - Bearer of the „Marin Drinov" order of the Bulgarian Academy of Sciences.
2011 - Golden medal of the Scientific-Technical Union of Bulgaria.
2014 - Honoured member of the Bulgarian Chemical Society.
2015 Order of Saints Cyril and Methodius 1st class – the highest award for scientific achievements conferred by the President of Bulgaria.

Biographical sketch

Christo Balarew was born on 23.06.1934 in Sofia. He graduated chemistry at the "St. Climent Ohridsky" University, Sofia. After two years as a teacher in Chemistry at the "Christo Botev" secondary school, Sofia, he was appointed as Chemist at the Chemical Institute of the Bulgarian Academy of Sciences, Sofia. He defended his PhD-thesis at the Mining Academy in Freiberg, Germany. During 1976-77 he was an Alexander von Humboldt Fellow at the University of Muenster (Prof. Dr. H. Schaefer), Germany. In 1983 he defended his Doctor of Sciences-thesis. (Bulgarian Academy of Sciences) and was elected for Professor and Head of the Inorganic Salts Research Laboratory, Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Sofia. He was Invited Professor at the Université Claude Bernard Lyon 1, France (1990), at the Universidad de Valladolid Departamento de Fisica de la Materia Condensada, Cristallografia i Mineralogia, Spain (1991-92) and at the Institut für Anorganische Chemie, TU Bergakademie Freiberg, Germany (2012). He was President of the Chemical Commission at the Higher Attestation Committee of the Council of Ministers (1992-1995), President of the National Oceanographic Committee, Bulgaria (1993-2001), Member of the Board of Managers of the Bulgarian Academy of Sciences (1994-2002), Deputy Minister at the Ministry of Education and Science, Bulgaria (1997-2002).

Prof. Balarew is author of over 200 publications in scientific journals, 19 patents and his scientific achievements are cited more than 2000 times in the scientific literature.

Prof. Balarew was National Representative and Associated Member of Commission V.8, National Representative, Associate Member and Titular Member of the Analytical Chemistry Division Committee. Since 1999 he is President of the National Committee of Chemistry of Bulgaria for IUPAC. Prof. Balarew is coauthor of many publications in Pure and Applied Chemistry and two books from the Solubility Data Series. With his active participation and under his editorship the Nomenclature of Inorganic Chemistry, Recommendations of IUPAC 2005 was translated from English and adapted to the Bulgarian language. He was Chairman of the 10^{th} ISSP International Symposium on Solubility Phenomena, sponsored by IUPAC, Varna, 22-26 July, 2002 and Chairman of the Workshop “Solubility Phenomena – Application for Enviromental Improvement”, Varna, 22 – 24 July 2002. He was member of the Organizing Committees of almost all IUPAC Solubility Phenomena Symposia and member of the Editorial Boards of many IUPAC - Solubility Data Series Volumes since 1989.

CURRICULUM VITAE – MAY 2015

Christopher Michael Ashton Brett

Full Professor, Faculdade de Ciências e Tecnologia, Universidade de Coimbra, Portugal

Departamento de Química, Faculdade de Ciências e Tecnologia, Universidade de Coimbra, 3004-535 Coimbra, Portugal

e-mail: cbrett@ci.uc.pt Web: www.uc.pt/pessoal/chrisbrett

Born: 1954, Letchworth, Herts, UK

Nationality: British and Portuguese (since 1983)

Academic qualifications:

BA (Hons.)	Chemistry	University of Oxford	1977
DPhil	Electrochemistry	University of Oxford	1981
DSc "Agregação"	Chemistry	University of Coimbra	2002

1981 until present Faculty of Sciences and Technology, University of Coimbra, Portugal

1980-1 Oil Trading and Supply Dept. BP, London

1993-6 Honorary lecturer, University of Manchester Institute of Science and Technology.

Fellow of the Royal Society of Chemistry (UK) and Chartered Chemist (CChem, FRSC).

Director of the Laboratory of Electroanalysis and Corrosion, Instituto Pedro Nunes (IPN), Coimbra, Portugal (www.ipn.pt). IPN is a technological innovation institute and award-winning incubator of new enterprises, linking the University of Coimbra with the industrial sector.

International Union of Pure and Applied Chemistry (IUPAC)

Elected Member of the Bureau, 2012-15.
Member, IUPAC Membership Relations Committee, 2012-15
Member, IUPAC Centennial Planning Steering Group, 2015 –
Member, IUPAC Web Vision Task Force, 2014-15

Physical and Biophysical Chemistry Division (Division I): President, 2006-7; Past President 2008-9, Vice-President, 2004-5, Titular Member, 2000-2003.

Division I Advisory Subcommittee: 2010-15

Green Chemistry Subcommittee: Associate Member 2002-15

Committee on Chemical Education: Associate Member 2002-5

Electrochemistry Commission (Commission I.3): Chairman 2000-2001, Secretary 1998-9, Titular Member 1996-1997, Associate Member 1994-5.

Member, ad hoc Committee on the revision of the IUPAC Statutes and Bylaws, 2007-8.

IUPAC project activity:
- Project No. 2010-052-1-500: Electroanalytical Chemistry - Revision of the Orange Book Chapter 7
- Project No. 2008-016-1-300: "Chlorine-free syntheses for green chemistry" - PAC special topic issue (revised title)
- Project No. 2007-032-1-100: Green Book - Abridged Version
- Project No. 2002-002-2-500: Recent advances in electroanalytical techniques: characterization, classification and terminology
- Project No. 2001-028-1-100: Electrochemical impedance spectroscopy - terminology, nomenclature and data exchange formats
- Project No. 2002-029-1-300: A IUPAC coordinated web page on Green/Sustainable Chemistry
- Project No. 1999-005-1-100 - chairman: Electrochemistry and Interfacial Chemistry in Environmental Clean-up and Green Chemical Processes. The project included organization of an international symposium with ICSU support and publication of a special issue of Pure and Applied Chemistry.

International Society of Electrochemistry (ISE) – associated organization of IUPAC (www.ise-online.org)

President 2007-8 (Past President 2009-10, President-Elect 2005-6; Vice-President 2003-4).

Sociedade Portuguesa de Química (SPQ) (Portuguese Chemical Society)

President of the Analytical Division, 2003-5 and 1996-9.

Chairman of the organising committee of the international 7th European Conference on Electroanalysis (ESEAC'98) Coimbra, May 1998, and of "Electrochemistry and Interfacial Chemistry for Environmental Clean-Up and Green Chemical Processes (IUPAC/ICSU)", April 2001. Member of organising committee or scientific committee of many international conferences.

Current research interests, through national and international projects, and in international collaborations in Europe and the rest of the world are on:

- Development and characterisation of new electrode materials and composite electrode materials, particularly based on carbon, surface–modified electrodes, nanostructured materials with layer-by-layer and nanoparticle modification, and electroactive and conjugated polymers. Electrocatalytic effects.
- Development of electrochemical enzyme biosensors: new architectures using layer-by-layer structures and functionalised carbon nanotubes, sol-gel enzyme immobilisation, core shell structures, nanotechnological aspects. Application to foods and beverages for food safety and quality monitoring.
- Sensors for electroanalysis and speciation in waters and effluents, particularly of trace biotoxic chemically labile species, using flow and injection systems. Environmental toxicity sensors based on enzyme inhibition. Electroanalysis of pharmaceutical compounds.
- Corrosion and its inhibition: aluminium, steels, coated steels, copper and titanium alloys, dental amalgams in biological fluids. Protection of reinforced concrete structures. New adsorption inhibitors.
- Electrochemistry in ionic liquids and deep eutectic solvents – characterisation and application to sensor fabrication.
- Kinetics and mechanism of electrode processes.

Author or co-author of 2 books, 18 book chapters and 263 scientific articles (219 ISI).

Co-editor of special issues of Electrochimica Acta (1998, 2004, 2012 (to celebrate the International Year of Chemistry)) Analytica Chimica Acta (1999), Pure and Applied Chemistry (2001), Analytical Letters (2004, 2006) and Microchimica Acta (2008, 2010). At present, member of the Advisory Editorial Board of the journals Electrochimica Acta, Electroanalysis, Analytical Letters.

BOOKS

C.M.A. Brett and A.M. Oliveira Brett

Electrochemistry. Principles, methods and applications

Textbook, Oxford University Press, Oxford, 456 pages, June 1993. 2nd printing 1994, 3rd printing 1996, 4th printing 1998, 5th printing 2005.

Electroquímica. Princípios, métodos e aplicações

Translation published by Livraria Almedina, Coimbra, 496 pages, December 1996.

C.M.A. Brett and A.M. Oliveira Brett

Electroanalysis

Textbook, Oxford University Press, Oxford, 96 pages, October 1998.

Christopher Brett is a professor of chemistry in the Faculty of Sciences and Technology, University of Coimbra, Portugal, where he has been since 1981, lecturing mainly electrochemistry, physical chemistry, materials chemistry and analytical chemistry.

He has been an elected member of the IUPAC Bureau since 2012 and member of the Membership Relations Committee, Web Vision Task Force, Committee on Chemistry Research Funding and the Centennial Planning Steering Group. He has gained extensive experience in IUPAC matters since 1994. He was President of the Physical and Biophysical Division (Division I) of IUPAC from 2006-7, having been a Titular Member of the Division Committee since 2000 and Vice-President 2004-5. Before this, he was a member of the Electrochemistry Commission (Commission I.3) from 1994, having been Secretary in 1998-9 and Chairman from 2000-1. He is currently a member of the Green Chemistry Subcommittee (since 2005) and of the Division I Advisory Subcommittee, and was also a member of the Chemistry Education Committee in 2002-5. He has been or is involved in 7 IUPAC projects and was a member of the ad hoc Committee on the Revision of the Statutes and Bylaws of IUPAC in 2007-8.

He was President of the International Society of Electrochemistry (ISE) - an associated organization of IUPAC - from 2007-8 and was a member of the ISE Executive Committee from 2003-10; he was also coordinator of the 2011 International Year of Chemistry activities of ISE. He was President of the Analytical Chemistry Division of the Portuguese Chemical Society (Sociedade Portuguesa de Química) in 1996-9 and 2003-5.

Research interests include new nanostructured electrode materials and modified electrode surfaces, electroactive and redox polymers, corrosion and its inhibition, electrochemical sensors and biosensors, with applications in the environmental, food and pharmaceutical areas, which have been the subject of over 250 publications and have been presented in numerous conferences. He is also Director of the Electroanalysis and Corrosion Laboratory, Instituto Pedro Nunes, Coimbra, the technological innovation link between the University of Coimbra and the industrial sector, with an award-winning science-based incubator of new enterprises.

Mei-Hung Chiu's Profile 20150611

Mei-Hung Chiu is a Professor of Science Education at the Graduate Institute of Science Education (GISE) of the National Taiwan Normal University (NTNU). She has a BS in chemistry (National Taiwan Normal University), Ed.M. and Ed.D. from Harvard University. She taught as a physical science and chemistry teacher in secondary schools for three years before serving as a science education researcher and professor at the university level. She has published articles about chemistry curriculum, students' conceptual understanding and changes as well as mental models in science learning in international well-known journals, such as *Journal of Research in Science Teaching* (JRST, SSCI journal), *Science Education* (SSCI), *International Journal of Science Education* (IJSE, SSCI journal), *International Journal of Science and Mathematics Education* (IJSME, SSCI), *British Journal of Educational Technology* (BJET, SSCI), *Chemical Education Theory and Practice* (CERP, SSCI), *Journal of Chemical Education* (JCE, SCI/SSCI), and co-edited books (such as *Celebrating the 100th Anniversary of Madame Marie Sklodowska Curie's Nobel Prize in Chemistry*).

In her research, Chiu made some influential contributions on investigating students' alternative conceptions in learning chemistry. Their impact was national as well as international. First, she was the principal investigator for a national survey examining Taiwanese students' alternative conceptions in chemistry (topics included particles, chemical equilibrium, acid/base, etc.). Around 14,000 elementary through high school students took part in the survey. In 2007, the *International Journal of Science Education* (SSCI) invited our entire research team (including those in physics and biology) to publish the results of their studies in the *International Journal of Science Education* (SSCI), the first country-themed special issue according to the editor of the journal. We believe the impacts and values of the studies were not only regionally but also globally significant. Second, Chiu has been involved in national curriculum standards in Taiwan and experiencing student learning outcomes on international assessments studies, such as Tends in International Mathematics and Science Study (TIMSS) and the Programme of International Students Assessment (PISA), in various capacities. With deep involvement, she has published journal articles in the *International Journal of Science and Mathematics Education* explaining reasons Asian students outperformed students in western countries. These papers shed some light on high expectations of teachers and parents, attributed to students' learning, and Asian students tending to have high performance but low interest in science. Her recent research topics include (1) promoting students' perceptions on scientific models and developing model-based inquiry and modeling competence in learning science, and (2) exploring whether facial microexpression state (FMES) changes can be used to identify moments of conceptual conflict, one of the pathways to conceptual change.

Besides the research, Chiu was the President of the Association of Science Education in Taiwan (2009-2010), the International Coordinator for National Association for Research in Science Teaching

(NARST, the most influential science education association in the world) based in the USA (2008-2010), and currently elected as President-elect of NARST. During her leadership, she initiated the Linking Science Educators Program (LSEP) to promote science education in emerging countries (such as Malawi in 2008, Nigeria in 2009, and South Africa in 2010). LSEP is still running in emerging countries to help science educators promoting excellent quality of research and practice of science education. She was an Associate Editor of *Journal of Research in Science Teaching* (JRST, SSCI journal, ranking as the first journal in science education) (2010-2014), Chair of Committee on Chemistry Education (CCE) of IUPAC (2012-2015), Project Director of Asian Chemical Education Network (ACEN) of Federation of Asian Chemical Societies (FACS), and Chairperson of Committee on Chemistry Education Affairs of Chemical Society in Taipei (CSLT), Taiwan. She is also engaged in international projects sponsored by CCE of IUPAC, such as Young Ambassadors for Chemistry to promote public understanding of chemistry (with Dr. Lida Schoen from the Netherlands and Dr. Erica Steenberg from South Africa), visualization in chemistry (with Prof Dr. Peter Mahaffy from Canada), and Flying Chemists Program (FCP) to provide innovative teaching and learning for emergent countries. With the involvements of these projects and IUPAC CCE, she has been to Korea (YAC, 2006), Mauritius (YAC, 2008), Philippines (FCP and YAC, 2008, 2010), Malaysia (YAC, 2010), Croatia (FCP, 2010), Ethiopia (FCP and YAC, 2011), Mexico and Panama (YAC and FCP, 2012) to promote public understanding of chemistry and innovation in chemistry education all over the world. She was a recipient of the Distinguished Contribution to Chemical Education Award from the Federation of Asian Chemical Societies (FACS) in 2009. She delivered invited plenary and keynote lectures at various professional conferences, such as IUPAC International Conference on Chemical Education (2004, 2012), The Royal Australian Chemistry Institute Division of Chemical Education Conference (2008), the 3rd Symposium of Network Inter-Asian Chemistry Education in Japan in 2009, an award speech for Distinguished Contribution to Advancement of Chemical Education at the 13th Asian Chemistry Congress of the Federation of Asian Chemical Societies, Shanghai, China in 2009, Chemistry Education Conference sponsored by Federation of African Society of Chemistry (FASC) and by UNESCO for celebrating the International Year of Chemistry (IYC) declared by the UN in Ethiopia, IUPAC International Conference on Chemistry Education and World Congress Conference in 2011, 2012, and 2013. She was also recognized by Marquis Who's Who in Asia (1st edition) in 2007 and Marquis Who's Who in the World (26th edition) in 2009. She is also continuously recognized as an outstanding scholar by receiving research grants and special financial support awards over the past few years.

In sum, Dr. Chiu published 107 peer reviewed journal articles (32 in English in the international journals and 75 in Chinese), over 149 conference presentations (in English), four edited books (in English), more than 25 plenary/keynote speeches, and supervised 84 advisees to receive their advanced degrees (17 in PhD and 67 in MS) in science education.

Mei-Hung Chiu

Candidate for IUPAC Bureau Member

Institutional Affiliation: Graduate Institute of Science Education, National Taiwan Normal University, Taipei, Taiwan

It is a great honor to be nominated for IUPAC Bureau member and to have the opportunity to further promote the interactions between scholars and practioners among the international community. Since earning my doctorate at Harvard and a postdoc at the University of Pittsburg, IUPAC has been my organization for research and practice in chemistry education and I am a regular attendee at the biennial International Conference on Chemistry Education (ICCE) as well as IUPAC General Assembly and World Chemistry Congress. As such, the organization means a great deal to me, and I take immense pride in being part of IUPAC's efforts to promote chemistry literacy worldwide. Being a member of IUPAC Committee on Chemistry Education (CCE) for more than 15 years, I had the privilege to be the National Representative since 2002, Titular Member from 2008 to 2011, and to lead the IUPAC CCE as the chair from 2012 to 2015. During my tenure as a member of CCE, I collaborated with various backgrounds of scholars across the world to promote chemistry education. For instance, I joined the IUPAC CCE's Young Ambassadors for Chemistry (YAC) Program and co-launched the YAC program in Mauritius, 2008; Philippines and Malaysia, 2010; Ethiopia in 2011; Mexico and Panama, 2012; and Thailand and Cambodia, 2014). Also, I have been involved in Flying Chemistry Educators Program (FCEP, formally entitled as FCP) to provide research resources to chemists and chemistry teachers for enhancing teaching quality and providing alternative instructional strategies in different continents. The FCEP is still in operation in emerging countries to help chemistry educators promote excellent quality of research and practice of chemistry education in their unique sociocultural and sociopolitical contexts. I was a recipient of the Distinguished Contribution to Chemical Education Award from the Federation of Asian Chemical Societies (FACS) in 2009.

My research areas include mental models and conceptual change on students' understanding of scientific phenomena as well as alternative assessment in science teaching and learning. I have published in high impact journals including *JRST, BJET, CERP, IJSE, and IJSME.* My goals for conducting research are to help students understand science, motivate students to be interested in learning science, facilitate teachers' instruction, and increase the quality of chemistry education and chemistry literacy for all.

CURRICULUM VITAE

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Current post:

- Professor of Environmental Science and Public Health Education ,
  Department of Natural Sciences, School of Science and Technology, Middlesex University
- Programme Leader for Doctorate in Professional Studies Environment and Risk pathways.

Education & qualifications:

- PhD, London University, 1991. Thesis titled 'Studies on the growth and attenuation of hepatitis A virus in cell culture'.
- MSc (with distinction), School of Applied Science, Hebrew University, Jerusalem, Israel, in Human Environmental Studies.
- BSc (Hons), Chemistry. Technion, Israel Institute of Technology, Haifa, Israel.

Representation on National and International committees

- Secretary of 'International Union of Pure and Applied Chemists' (IUPAC) Division of Chemistry and the Environment (Division VI): 2013-
- Member of the UK delegation to the IUPAC council:2010-
- Invited referee : The Portuguese Foundation for Science and Technology (FCT) : 2013-2014
- Division representative on the Committee on Chemistry Education (CCE) . IUPAC
- Chair of the Subcommittee on Chemistry of Environmental Compartments Division of Chemistry and the Environment. IUPAC: 2008-2014
- A Panel Member for the Research Council of Norway. *2009-2012*
- Panel: *Responsive Mode Projects in Environment and Development (FRIMUF)*

- A member of the of the editorial board of *Work Based Learning e-Journal* ISSN 2044-7868 *http://wblearning-ejournal.com*
- Member of executive committee of the Committee of Heads of Environmental Science (CHES) and a representative of Middlesex University. 1999- 2008

Membership of learned societies and professional organisations:

- Fellow of the Royal Society of Chemistry
- Member of The America Chemical Society
- Fellow the Higher Education Academy
- Member of the London Freshwater Group
- Fellow Royal Society of Tropical Medicine up to 2010
- Member International Water Association up to 2012
- Member of the Institution of Environmental Sciences up to 2012
- Member Society for Applied Microbiology up to 2009

Research supervision, Teaching and Assessment

- Completions: (9 PhD, 1MProf, 12 DProf)
- Current supervision: (4 PhD, 2MProf, 8 DProf)
- Leader of Master and Doctorate in Professional Studies (M/DProf) environment.
- Leader of MSC module 'Monitoring and Control of Pollution'
- Have supervised to completion over 50 MSc projects

External examinership

- External examiner for MSC in Radioecology at the University of Life Science, Oslo, Norway
- External examiner for University of Plymouth, School of Earth Ocean and Environmental Science. BSc Environmental Science 2005- 2009
- External examiner for University of Central Lancashire. BSc Environmental Science. 2001-2006
- External examiner for London School of Hygiene and Tropical Medicine. MSc Infectious Diseases. Distance Learning. 1999-2003

Research and development and scholarly activity

A long term interest in public health, with particular focuses on health and hygiene aspects of water and sanitation systems. I have led research in the areas of water pollution control environmental microbiology and bio-remediation. This involves the investigation of health aspects of chemical and microbial pollution, in particular, the fate of antibiotic resistant microorganisms in the environment and in food.

My interest in pollution affecting poor societies has also led me to investigate the problem of arsenic pollution in drinking water. Arsenic currently threatens millions of people in West Bengal and Bangladesh, as a result of their exposure to contaminated groundwater. Major problems have also been identified in some areas in the USA and China and South America. The research I have carried

out at Middlesex included the investigation of specific remediation technologies based on adsorption processes and a critical review of the available processes for remediation and mitigation.

My research work highlighted the need for professionals in the fields of environmental and public health to understand, confront, tackle complexity and work across boundaries. The capacity to assimilate and integrate information from different sources and critically analyse options are essential skills in enabling and taking leadership roles in implementing sustainable solutions. This is particularly important at the post graduate level. My experience and expertise has been very influential in my contributions to curriculum development and the establishment of Masters and Doctorates in Professional Studies (MProf/DProf) which are equivalent to MPhil/ PhD but which are designed to address the need of professional at the work place. The candidates I supervise are very senior professionals and most of the research and development involves high level strategic developments.

Current and recent Projects (since 2005):

- Rose J et al (2014) The Global Water Pathogen Project (GWPP). A state-of-the-art reference work on water-related disease risks and intervention measures (replacing *Sanitation and Disease Health Aspects of Excreta and Wastewater Management* by Feachem, Bradley, Garelick and Mara. 1983) and creating an online open-access data base and knowledge platform. Supported by The Gates Foundation and UNESCO
- Fatta-Kassinos et al (2014) .Working Group N°5: Wastewater Reuse. *Screening campaign of selected antibiotic resistance determinants and mobile genetic elements (AR/MGE) in WWTPs in Europe .*
- Fatta-Kassinos et al (2014) .COST Action ES1403. NEW AND EMERGING CHALLENGES AND OPPORTUNITIES IN WASTEWATER REUSE (NEREUS) .
- Chan et al (2014) Crohn's Disease, the Gut Microbiota and IgG4 based Exclusion Diet . A Randomised Cross–Over Study. A collaborative MD study between St Georges Hospital and Middlesex University.
- Pachenari and Garelick (2014) .Investigation of bacteria present in human breast milk and their relationship with intestinal microbiota of baby.
- Osae-Twum, Garelick et al (2012) Dysbiosis and Inflammatory Bowel Disease: The role of Gut Microbiota in Ulcerative colitis (UC)
- Lundy L, Garelick H, Jones H and Kapas A (2012). Integrating Water cycle management: building capability, capacity and impact in Education and Business (I-WEB). EU- EACEA TEMPUS IV- Joint Projects / Structural Measures.
- Georgiadou E, Garelick H, Jones H (2009-2012). TEMPUS action 159311-TEMPUS-2009-1-IT-TEMPUS-JPCR. "Network for Master training in technologies of water resources management" (NETWATER)
- Garelick H and Jones H (2008-2012). COST Action TD0803 "Detecting Evolutionary Hot Spots of Antibiotic Resistances in Europe (DARE)" http://www.cost-dare.eu/
- Garelick H and Weller G . (2009-2010). IHM Project on The evaluation for Accreditation of Health and Social care Managers – a pilot. Institute of Health Management (IHM)

- Garelick H and Page A (2009). Inspire Exploratory Partnership Project (awarded by the British Council) for the development of collaborative provision will of transdisciplinary and multi-disciplinary training framework.
- Garelick H and Priest N ENEN II. (2006-2008). Consolidation of European Nuclear Education, Training and Knowledge management. EU Sixth Framework Programme.
- Priest N. and Garelick H. SEMIRAD II. (2004-2008). Hazards presented by radionuclide deposits NATO - Science for Peace programme
- Purchase D and Garelick H (2005-2006) 'Enzymatic degradation of prion proteins by proteolytic microorganisms isolated from activated sludge'.
- Priest N. and Garelick H. (2003 -2006) EURAC 'Securing European Radiological Protection and Radioecology Competence to meet the Future Needs of Stakeholders'. European Commission. EURATOM
- Revitt M., Garelick H. and Shutes B. (2003-2006). Optimisation of airport runoff pollutant removal processes within a combined wetland/aerated pond treatment system. BAA. Heathrow
- Garelick H. (2002-2006). Antibiotic-resistance in *Campylobacters* isolated from chicken raised in Intensive and organic farms and an assessment of the relative associated risk to human health. Royal Thai Government sponsorship.

IUPAC projects

- Joint chair: Project No. *2014-031-1* The Environmental and health challenges of E-Waste and its management: an emerging 21st century global concern.
- member: Project No. *2011-060-1* Appropriate consideration of bioavailability of metals/metal compounds in the aquatic environment.
- member: Project No. 2009-048-1-600: Guidance for substance-related environmental monitoring strategies regarding soil and surface water
- member: Project No. 2008-003-3-600: Regional Drinking Water Quality Assessment in the Near East (Palestinian Authority, Jordan, and Israel) ï¿½ An Overview and Perspective
- chairman: Project No. 2003-017-2-600: Remediation technologies for the removal of arsenic from water and wastewater

Selected publications (since 2003)

Peer reviewed papers

- Pantoja M. L., Purchase D, Jones H, Feldmann J and Garelick H* (2015) The involvement of Glutathione, Phytochelatins and their transport systems in the detoxification of As(III), As(V) and DMA in *Chlorella vulgaris* . In preparation.
- Wai Kit Chan, Dirk Wildeboer, Hemda Garelick, Diane Purchase. (2015). Bioavailability of metalloids in a contaminated soil and the effect of antimonate on arsenate sorption by *Acidomyces acidophilus* isolated from the a disused tin mine. In preparation.
- Soonthornchaikul N, Watt J Garelick H. (2015). Assessment *of health risk of antimicrobial resistant Campylobacter associated with the consumption of organically and intensively reared broilers.* In preparation.

- Rüdel H*, Díaz Muñiz C, Garelick H, Kandile NG, Miller BW, Pantoja Munoz L, Peijnenburg WJGM, Purchase D, Shevah Y, van Sprang P, Vijver M, Vink JPO(2015). Consideration of the bioavailability of metal/metalloid species in freshwaters: experiences regarding the implementation of biotic ligand model-based approaches in risk assessment frameworks, Accepted for publication in Environmental Science and Pollution Research. Published online: 08 March 2015. DOI 10.1007/s11356-015-4257-5
- Leonardo Pantoja Munoz, Diane Purchase, Huw Jones, Jorg Feldmann and Hemda Garelick* (2014). Enhanced determination of As-phytochelatin complexes in Chlorella vulgaris using focused sonication for extraction of water-soluble species. Anal. Methods, 2014, 6 (3), 791 - 797
- M. L. Pantoja, H. Jones, H. Garelick*, H. G. Mohamedbakr, M. Burkitbaev. (2013). The removal of arsenate from water using iron modified diatomite complex (D-Fe): isotherm and column experiments. Environ Sci Pollut Res DOI 10.1007/s11356-013-1891-7.
- Emeka A. Okoroma, Diane Purchase*, Hemda Garelick, Roger Morris, Michael H. Neale, Otto Windl and Oduola O. Abiola. (2013). Enzymatic formulation capable of degrading scrapie prion under mild digestion conditions. PLoS ONE 8(7): e68099. doi:10.1371/journal.pone.0068099
- Kördel W, Garelick H Gawlik BM, Kandile NG, Peijnenburg WJGM, Rüdel H. (2013). Substance-related environmental monitoring strategies regarding soil, groundwater and surface water — an overview . Environ Sci Pollut Res. DOI 10.1007/s11356-013-1531-2
- Cantas H*, Cavaco L, Manaia C, Virta M, Walsh F, Popowska M, Qaswar SAS, Garelick H, Bürgmann H, and Sørum H. (2013). *A multidisciplinary review on the antibiotic resistance problem and re-thinking strategies.* Accepted for publication is Frontiers in Antimicrobials, Resistance and Chemotherapy
- Okoroma E, Garelick H, Abiola O, Purchase D* (2012) Identification and characterisation of a *Bacillus licheniformis* strain with profound keratinase activity for degradation of melanised feather. Journal of Biodegradation and Bioremediation 74:54–60 http://www.sciencedirect.com/science/article/pii/S0964830512002028
- Weller G, Margaret Volante M, Garelick H. *(2011) Power Participation and Partnership: Methodological reflection on researching professional doctorate candidates experiences of researching in the workplace.*. Work Based Learning e-Journal,
- Jiang Y, Purchase D, JonesH, Garelick H. (2011). Effects of Arsenate (AS^{5+}) on Growth and Production of Glutathione (GSH) and Phytochelatins (PCS) in *Chlorella Vulgaris.* International Journal of Phytoremediation 13(8): 834 - 844
- Adeyemi A, Garelick H, Priest ND (2010) *A biokinetic model to describe the distribution and excretion of arsenic by man following acute and chronic intakes of arsenite/arsenate compounds by ingestion*. Human & Experimental Toxicology published online 10 March 2010. DOI: 10.1177/0960327110364912. http://het.sagepub.com/content/29/11/891.full.pdf
- Weller G and Garelick H and Naylor D and Sherry R. (2010) .*Organisational involvement in supporting the learned professional.* Work Based Learning e-Journal, 1 (1). pp. 106-124. ISSN 2044-7868.
- Soonthornchaikul N and Garelick H (2009). *Antimicrobial resistance of Campylobacter species isolated from edible bivalve molluscs purchased from Bangkok markets, Thailand.* Foodborne Pathogens and Disease, 6(8): 947-951. doi:10.1089/fpd.2008.0236
- Ellis JB and Garelick H (2009). M*ulti-criteria analysis for the assessment of options for the mitigation/remediation of arsenic in drinking water.* Reviews in Environmental Contamination and Toxicology. 197:129-162.
- Garelick H, Jones H, Dybowska A, Valsami-Jones E. (2009). *Arsenic pollution sources*. Reviews in Environmental Contamination and Toxicology. 197:17-60
- Adeola S, Revitt M, Shutes B, Garelick H, Jones H, Jones C (2009) *Constructed Wetland Control of BOD Levels in Airport Runoff.* International Journal of Phytoremediation, 11:1–10
- Soonthornchaikul N, Garelick H, Jones H, Jacobs J, Ball D and Choudhury M. (2006). *Resistance to three antimicrobial agents of Campylobacter isolated from intensively and organically reared chickens purchased from retail outlets*. International Journal of Antimicrobial Agents 27:125-130

- Sneddon R, Garelick H, Valsami-Jones E. (2005). *Arsenic (V) removal from aqueous solutions by hydroxylapatite bone char*. Mineralogical Magazine 69:769-780.
- Garelick H, Dybowska A, Valsami-Jones E and Priest N. (2005). *Remediation Technologies for Arsenic Contaminated Drinking Waters*. Journal of Soils & Sediments 5:182–190
- Omari K, Revitt M, Shutes B and Garelick H. (2003). *Hydrocarbon removal in an experimental gravel bed constructed wetland.* Water Science and Technology. 48:275–281
- Egli H, Dassenakis M, Garelick H, van Grieken R, Peijnenburg WJGM, Klasinc L, Kördel W, Priest N, Tavares T. (2003). *Minimum requirements for reporting analytical data for environmental samples.* Pure and Applied Chemistry. 75:1097-1106

Journal editorship (special issue)

H Garelick, B Miller, W Peijnenburg (2014) – editors of a special issue of Pure and Applied Chemistry, (2014) Environmental Chemistry. 44th IUPAC Congress, Istanbul, Turkey, 11-16 August 2013.
Garelick, Hemda; Miller, Bradley ; Peijnenburg, Willie (2014) 44th IUPAC Congress: Environmental Chemistry. Pure and Applied Chemistry. Volume 86, Issue 7 (Jul 2014), pp. 1083-1256 Published Online: 07/07/2014. http://www.degruyter.com/view/j/pac.2014.86.issue-7/issue-files/pac.2014.86.issue-7.xml

Garelick H and Jones H (editors) (2009). *Remediation technologies for the removal of arsenic from water and wastewater. Externally Reviewed and* Accepted for publication as a special issue in Reviews in Environmental Contamination and Toxicology. Vol 197.Springer.

Refereed Conference presentations

- Garelick H, Weller G, Page A. (2014) .What is the role of Doctoral level CPD in professional organisations? *4th* International Conference on Professional Doctorates (ICPD-4), the Wales Millennium Centre, Cardiff on 10th & 11th April., 2014

- Isimekhai K.A, Watt .J, Garelick .H, Purchase .D (2014). Perception of Workers at an Improper Electronic Waste Recycling Site in Lagos State, Nigeria.
- Poster presentation: 23rd Annual meeting of the Society for Risk Analysis. "Analysis and governance of risks beyond boundaries". Istanbul, Turkey, 16 - 18 June 2014.
- Won the best poster prize

- Leonardo Pantoja, Diane Purchase, Huw Jones, Jörg Feldmann and Hemda Garelick (2014). The Mechanisms of Arsenic bioremediation from water by the Green Microalgae Chlorella vulgaris.
- Oral presentation: THE BNASS / TraceSpec Tandem Conference Aberdeen, Scotland; 31st August - 4th September 2014

- Pantoja L, Garelick H*, Purchase D and Jones H. Arsenic Chelation, The meeting of Two Kingdoms
- Poster presentation: Malta Vi Frontiers of Science: Research and Education in the Middles East. November 10-15, 2013, Malta.

- Pantoja L, Garelick H., Purchase D., Jones H (2013). **Arsenic Chelation, The Meeting of Two Kingdoms. Presented at the** Bioavailability of Metals, Metalloids and Organic Contaminants in the Environment symposium at 44th IUPAC Congress - Clean Energy Through Chemistry, 2013, Istanbul, Turkey 12-16 August 2013.

- Pantoja L, Garelick H., Purchase D., Jones H (2012). The occurrence of Arsenic-Glutathione complexes in *Chlorella vulgaris*: off-line elemental (ICP-MS) and molecular (ES-MS) detection for HPLC separation . 6th SETAC World Congress / SETAC Europe 22nd Annual Meeting in the Estrel hotel in Berlin from 20-24 May 2012

- Tuckwell R, Revitt, Huw Jones and Hemda Garelick. (2012).Distribution of minimum inhibitory concentrations to antibiotics in *E.coli* and Enterococci isolated from wastewater effluents and surface waters. 6th SETAC World Congress / SETAC Europe 22nd Annual Meeting in the Estrel hotel in Berlin from 20-24 May 2012

- Garelick H, Weller G (2012) *Reflections on recognition and accreditation of learning towards a professional doctorate programme*. *3rd* International Conference on Professional Doctorates (ICPD-3), Florence, UK 2-3 April 2012

- Tuckwell R, Revitt M, Garelick H, Jones H and Ellis B,(2011) Sources and pathways for pharmaceuticals in the urban water environment, 12th International Conference on Urban Drainage, Porto Alegre, Brazil (2011) 11-16 September,

- Okoroma, E.A, Purchase D., Garelick H., Morris R. and Abiola O. 2011. Degradation of infective prion protein by a novel enzymatic composition. PRION 2011, Montreal, 16-19 May, 2011.

- Okoroma E A., Purchase D., Garelick H. and Abiola O. 2011. *A novel enzymatic composition effective for prion degradation.* Society for General Microbiology Spring Conference, Harrogate, 11-14 April, 2011.

- Weller G, Margaret Volante M, Garelick H. (2011) Power Participation and Partnership: Methodological reflection on researching professional doctorate candidates experiences of researching in the workplace. 2nd *International Conference on Professional Doctorates* (ICPD-2) Edinburgh, UK 20-21 April 2011

- Weller G and Garelick H and Naylor D and Sherry R. (2009). *Organisational involvement in supporting the learned professional.* .International Conference on Professional Doctorates. London, UK, 9-10 November, 2009.

- Okoroma, E.A, Purchase D., Garelick H., Jen A., Morris R. and Abiola O. 2009. Degradation of scrapie infected brain homogenate by a novel bacterial keratinase. Prion 2009, Chalkidiki, Greece, 23-25 September 2009.

- Okoroma E A., Purchase D., Garelick H. and Abiola O. 2009. *Temperature and pH interaction in keratinase production of a novel feather degrading bacteria.* 10th International Symposium on Bacterial Genetics and Ecology, Uppsala, Sweden, 15-19 June 2009.

- Okoroma EA, Purchase D., Garelick H., Abiola A. and Abiola O. 2009. *Keratinases and Prion inactivation: Possibilities from keratin degradation.* Canada 3rd Annual Prion Research Conference PrP^{CANADA} 2009, Alberta, Canada, 1-3 March 2009.

- Okoroma E A., Purchase D., Garelick H. and Abiola O. 2009. *Bacterial Keratinase: Prospects for prion degradation. Society for General Microbiology Meeting*, Harrogate, 30 Mar- 2 Apr 2009.

- Garelick H, Page A and Weller G. (2008). *Work Based Learning for the Development of the Chemistry Professiona*l. 2nd International IUPAC conference on Green Chemistry. Moscow- St. Petersburg. Russia. Sept 14-19.

- Okoroma E A., Purchase D., Garelick H. and Abiola O. 2008. *Keratinase production by proteolytic microorganisms in activated sludge and farmyard waste.* 163rd Society for General Microbiology Meeting, Ireland, 8-11 September 2008.

- Garelick H, Rounce K and Garnnet J (2007). T*he development of Work Based Learning for Sustainable Environmental Education*. presented at "47th World Environmental Education Congress" Durban, South Africa http://www.weec2007.com/ . 2nd -6th July 2007.

- Purchase D, Garelick H, Okoroma E, Christen H, Abiola O. (2007). *Keratin degradation by proteolytic microorganisms isolated from activated sludge and farmyard manure: possible application in*

decontamination of prion protein. 9th Symposium on Bacterial Genetics and Ecology - BAGECO 9", 23 -27 June 200,7 Wernigerode, Germany.

- Adeola A Revitt M, Shutes. B, Garelick H and Jones J.2006. *A combined constructed wetland and aerated pond system for the treatment of airport runoff: operational issues.* 10th International Conference on Wetland Systems for Water Pollution Control, 23-29th Sept 2006. Lisbon Portugal

- Mitchell, P.I., Bowden, L,. León Vintró,L , García-Tenorio R, Garelick H, Holm E, Kovács T, Kovats N, Priest N Salbu B, Skipperud Land Tamponnet C (2005). *Existing competence and infrastructure in relation to radiation protection, radiochemistry and radioecology training at postgraduate level within the EU and new entrant States.* Prsented at the 3rd international conference on education and training in radiological protection, ETRAP2005, 23-25 November 2005. Brussels, Belgium.

- Tamponnet C, Salbu B, Skipperud L, Mitchell P, Holm E, Garcia-Tenorio R, Kovats N, Abbott A, Davids C, Garelick H, Priest N. 2005. *Eurac: A project to strengthen scientific academic competence and analytical skills within radiation protection, radiochemistry and radioecology*. Presented at the 3rd international conference on education and training in radiological protection, ETRAP2005, 23-25 November 2005. Brussels, Belgium.

- Sneddon R, Garelick H, Valsami-Jones E. (2005). *Arsenic (V) removal from aqueous solutions by hydroxylapatite and incinerated bone meal*. Poster presentation at the Mineralogical Society Winter Conference "Environmental Mineralogy Geochemistry& Human Health" Bath Spa University January 6-7th 2005. Bath, UK.

International Conferences organisation

- Proposer of the following project Three Technical Symposia on Environmental Chemistry at the 44th IUPAC Congress - Clean Energy Through Chemistry, 2013
    1. Analytical and Risk Considerations for Nanomaterials and Emerging Environmental Contaminants – (H Garelick)
    2. Marine Pollution and Sustainable Management of Coastal Environment. (M Dassenakis)
    3. Bioavailability of Metals, Metalloids and Organic Contaminants in the Environment (W Peijnenburg)
- Member oft he organising committee of the *3rd* International Conference on Professional Doctorates (ICPD-3), Florence, UK 2-3 April 2012
- Convener of the Symposium "Sustainability of Water Quality", within 43rd IUPAC Congress - Chemistry Bridging Innovation among the Americas and the World. San Juan, Puerto Rico 30 July- 5 August 2011.
- Member oft he organising committee of the *2nd International Conference on Professional Doctorates* (ICPD-2) Edinburgh, UK 20-21 April 2011
- Convener of the Symposium "Analytical and Risk Considerations for Emerging Environmental Issues" within the 42nd IUPAC Congress. 3 – 7 August 2009, SECC, Glasgow. Organised by the Royal Society of Chemistry.
- Member of the organising committee of the International Conference on Professional Doctorates. London, UK, 9-10 November, 2009.

Invited Conference Presentations

- Garelick H (2013)- *The emergence of antimicrobials resistance as a global risk to health.* World Environmental Health Day , Thursday September 26th 2013, CIEH, Chadwick Court, , London. SE1 8DJ

- Garelick H, Page A, Weller G. (2011) Distance Learning and Work Based Learning for the Development of the Industry Professional. STAR Stakeholder Workshop on Education and Training Supply in Radioecology, November 15th- 16th, Voksenåsen, Oslo

- Garelick H, Tuckwell R, Balough T, Revitt M, (2011). Investigating the sources and fate of pharmaceuticals in the water and soil environment: a continuous challenge. 43rd IUPAC Congress - Chemistry Bridging Innovation among the Americas and the World. San Juan, Puerto Rico 30 July- 5 August 2011.

- Garelick H (chair). (2008). Round-table discussion: examination of the environmental context for "Green Chemistry" and its relationship with the subject area of "Environmental Chemistry". 2nd International IUPAC conference on Green Chemistry. Moscow- St. Petersburg. Russia. Sept 14-19.

- Garelick, H. UK, (chair), J.C Bollinger, France,D.H Caussy, India A. Dybowska, UK,), J.B Ellis, UK, J. Feldman, UK H Jones, UK, B. Khoda, Bangladesh N. Priest, UK, Y. Shevah, Israel, E. Valsami-Jones, UK, P Visoottiviseth, Thailand (2005). Remediation technologies for the removal of arsenic from water and wastewater. Presented at the IUPAC General Assembly. 13-14 August Beijing. China.

- Garelick H and Ellis JB (2005). Multi-criteria analysis for the assessment of options for the mitigation/remediation of arsenic in drinking water. Presented at the International Workshop on Arsenic Contamination and Safe Water. 11-13 December 2005. Dhaka.Bangladesh.

- Garelick H and Rounce K. (2005). Work Based Learning for the Environmental Community. Presented to the annual general meeting of the committee of head of Environmental Science. University of Ulster.. 17-18 March 2005. Portrush, Northern Ireland, UK

Invited publications

Garelick H and Jones H. (2008). *Mitigating Arsenic Pollution: Bridging the Gap Between Knowledge and Practice.* Chemistry International Vol 30 No 4. July August 2008.
http://www.iupac.org/publications/ci/2008/3004/2_garelick.html

Book Series and book chapters for NETWATER TEMPUS project

Editorial Board: Prof Gustavo Capanelli, Prof Gennady Pavlikin, Prof Niklay Popov and Prof Hemda Garelick.
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Book chapters for IWEB TEMPUS project

- Hemda Garelick, Diane Purchase and Jose Luis Alonso Molina. *Microbial Pollution of Water*
- Hemda Garelick , Huw Jones, and Dirk Wildeboer. *Monitoring of water quality and pollutant levels*
- Hemda Garelick, Huw Jones and Dirk Wildeboer. *Sampling strategies*
- Hemda Garelick and Anne Dougall. *Project and Management skills.*

In the book: Meyer B and Lundy L (2014) "Integrated Water Cycle Management in Kazakhstan"

Other Book chapters

H. G. Mohamedbakr, M. Burkitbayev, H Garelick. (2012). The Use of diatomite based sorbent material for the removal of radionuvleides, heavy metals and metalloids from contaminated water and wastewater. In: Environmental Radioactivity in Central Aia. Eds: M Burkitbayev and J Lehto. Almatay "Kazah Univeristy 2012.

Hemda Garelick and Elli Georgiadou. 2011. Research Methods, Research Design and Project Management. In: Ed: Elli Georgiadou and Chris Sadler "Research Methods and Project Management. Textbook for the Master Programme "Complex Usage of Water Resource". Joint Project TEMPUS "Network for Mater Training In Technology of Water Resource Management" (NETWATER).Tambov.

Ivana Mahrikova, Stefan Stanko, Ivona Skultetyova, Hemda Garelick 2011. In: Wastewater Treatment . In Water Ecology and Human Impact. Joint Project TEMPUS "Network for Mater Training in Technology of Water Resource Management" (NETWATER).Tambov.

Rounce K, Garelick H, Vernon L and Portwood D. 2005. *The development of a Doctorate in Professional Studies in Health.* In: Work-Based Learning in Health Care: Applications and Innovations. Editors: Rounce K and Workman B. Kingsham Press. UK

Garelick H and Jones H. (2004). *Water Quality* in 'Encyclopaedia of Life Support Systems'. Published by UNESCO and EOLSS Publishers Co Ltd.

Garelick H. 2001 (3rd edition). *Safe Water*. In: Travellers' Health: How to Stay Healthy Abroad. Edited by; Dawood R. Oxford University Press.

Garelick H. 1989 (2nd edition). *Safe Water*. In: Travellers' Health: How to Stay Healthy Abroad. Edited by; Dawood R. Oxford University Press.

Garelick H. 1986 (1st edition). *Safe Water*. In: Travellers' Health: How to Stay Healthy Abroad. Edited by; Dawood R. Oxford University Press.

Garelick H, Mann GF, Harrison TJ, and Zuckerman AJ. (1988). *Defective Interfering Particles in Hepatitis A. In: Viral Hepatitis and Viral Disease*. Edited by AJ Zuckerman. Alan R. Liss, Inc. New York. USA.

Feachem RG, Bradley DJ, Garelick H and Mara DD. (1983). *Sanitation and Disease: Health Aspects of Excreta and Wastewater Management*. World Bank Studies in Water Supply and Sanitation No. 3. John Wiley and Sons. Chichister.

Popular book chapter.

Hemda Garelick. (2012) .Safe Water. in *Travellers Health: How to stay healthy abroad*. Ed: Richard Dawood. Oxford University Press. Oxford. UK.

Reports:

Garelick K and Weller G. (2010). Evaluation Study of the Accredited Manager Scheme Pilot Project. Report to the Institute for Healthcare Management.

Garelick H and Choonara A. (2007) Fabs fudge-: potential for development. Report to the North London Chamber of Commerce.

Soonthornchaikul N and Garelick H. (2007). Exposure of consumers to *Campylobacter* including antimicrobial resistant isolates following the consumption of bivalve molluscs. Report to Faculty of Public Health , Thammasat University, Thailand.

Green C, Donner E, Faulkner H, Garelick H, Jones H, Revitt M, Scholes L. (2007) Water and Health. In: 'Sustainable Water: Chemical Science Priorities' Royal Society of Chemistry report chapter 6 http://www.rsc.org/ScienceAndTechnology/Policy/Documents/water.asp

Priest N, Salbu B, Skipperud L and Garelick H (2007). Course materials and syllabi for the master of science in radiological protection, radiochemistry and radioecology (deliverables d 2.1.2.1, d 2.1.2.2, d 2.1.2.3,). Report to the European Commission.

Igbokwe O, Garelick H. (2003). Evaluation of *bzt® waste digester* and its effect on batch process, activated sldge in a laboratory scale fermentor. Commissioned by Bradco Environmental Solutions Ltd.

Garelick H, Rodriguez-Lsarte A and Purchase D. (2001). *Greywater Discharge from Canal Boats.* Canal water quality at Willow Wren residential mooring on the Grand Union Canal, Near Hays. A report of the results of a sampling programme commissioned by British Waterways and carried out at Middlesex University. Report to British Waterways.

Chong S, Garelick H, Revitt DM, Shutes RBE. (1997). *Glycol Dosing Experiments*, January - October 1996. Urban Pollution Research Centre, Middlesex University, Bounds Green, London. Report to British Airport Authorities.

Garelick H, Revitt DM, Shutes RBE, Chong S. (1997). *Microbiological Monitoring in Experimental Reedbed Treatment Systems, Eastern Balancing Reservoir, Heathrow Airport*. Urban Pollution Research Centre. Report to British Airport Authorities.

Garelick H, Revitt DM, Shutes RBE, Chong S. (1996). *Microbial Quality of Water and Substrate in a Trial Reed Bed Treatment System, Eastern Balancing Reservoir, Heathrow Airport*, Sixth Report. Report to British Airport Authorities.

Garelick H, Revitt DM, Shutes RBE, Chong S and Llewellyn N. (1996). *Microbial Quality of Water and Substrate in a Trial Reed Bed Treatment system, Eastern Balancing Reservoir, Heathrow.* Fifth Report. Report to British Airport Authorities.

Garelick H, Chong S, Todd D and Shutes B. (1995)a&b. *Microbial Quality of Water and Substrate in a Trial Reed Bed Treatment System, Eastern Balancing Reservoir, Heathrow Airport.* Third and Fourth reports. Report to British Airport Authorities.

Garelick H, Todd D and Shutes B . 1994a&b. *Microbial Quality of Water and Substrate in a Trial Reed Bed Treatment System, Eastern Balancing Reservoir, Heathrow Airport*. First and second reports. Report to British Airport Authorities.

Garelick H and Feachem RG. 1983. *The Application of the Enzyme-Linked Immuosorbent Assay (ELISA) in Environmental Virology.* Report to the Thames Water Authority.

Feachem RG, Bradley DJ, Garelick H and Mara DD. 1980. *Health Aspects of Excreta and Sludge Management. A State-of-the-Art Review. Appropriate Technology for Water Supply and S*anitation Volume 3. The World Bank. Washington, DC.

Prof. Ehud Keinan
Benno Gitter & Ilana Ben-Ami Professor of Chemistry
The Schulich Faculty of Chemistry, Technion-Israel Institute of Technology

Scientific career: Ehud Keinan was born and educated in Israel, received his B.Sc. from Tel Aviv University (1971), M.Sc. from Ben-Gurion University, Ph.D. from the Weizmann Institute of Science (with Yehuda Mazur, 1977), and was postdoc at the University of Wisconsin (with Barry M. Trost, 1977-1980). He has published nearly 200 research papers, 20 patents and 3 books on biocatalysis with antibodies and with synthetic enzymes, organic synthesis, molecular-computing, supra-molecular chemistry, improvised explosives and drug discovery. He received the New England Award for Academic Excellence, the Shannon Award, the CapCure Award, the Herschel-Rich Award, the Technion Prize for security technologies, the Henri Taub Prize for scientific excellence, and the Schulich Prize for the promotion of extraordinary academic activities. Since 2010 he is a Fellow of the AAAS. He was Dean of the Technion Schulich Faculty of Chemistry, was an Adjunct Professor at The Scripps Research Institute, La Jolla, California (1991-2014), was the founder and first Head of the Institute of Catalysis Science and Technology (ICST) in the Technion and founded two startup companies.

Public service: Since 2009, as Editor-in-Chief of the Israel Journal of Chemistry, he reformed the journal, transferred it to Wiley-VCH publishing house, increased its volume by 3-fold and increased its impact factor from 0.5 to 3.1 in less than four years. Keinan is member of the Executive Board of EuCheMS, member of the FACS and serves on the Council of the Wolf Foundation. Since 2008 he is Chairman of the Advisory Council of High School Chemistry Education. Since 2009 he has served as President of the Israel Chemical Society (already 3 terms). He has initiated national and international programs to promote chemistry education, including the Archimedes Project, which provides gifted high school pupils with academic education towards a B.Sc. degree in chemistry, expanded participation in the National and International Chemistry Olympiads, and the Negev-Nobel project, which provides chemistry education to disadvantaged pupils in the southern regions of Israel (with the involvement of four Israeli Nobel Prize laureates in chemistry). With the Israel Philatelic Service he produced 4 new Israeli stamps that commemorate the Nobel Prizes in chemistry, the International Year of Chemistry, International Year of Crystallography and International Year of Light. He expanded the representation and Israel in Europe, North America and Asia and initiated several bilateral agreements with various chemical societies.

Keinan has influenced the public opinion in the State of Israel via many opinion articles published in the Israeli press on science education, higher education, Israel's natural gas issues and the future of humanity. Two books on these subjects are currently under preparation.

Keinan is a citizen of both Israel and USA, fluent in Hebrew and English with partial knowledge in French, Arabic and Mandarin.

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EDUCATION

Ph.D. in Chemical and Materials Engineering, University of Iowa, Iowa City, Iowa (1980-1984)
M.S. in Applied Chemistry, Korea Advanced Institute of Science and Technology, Daejeon, Korea (1975-1977)
B.S.E. in Applied Chemistry, Seoul National University, Seoul, Korea (1971-1975)

RESERCH INTEREST

Membrane Preparation and Application in Membrane Reactor, Gas Separation, Pervaporation, Water treatment,

EXPERIENCE

President, Korea Research Institute of Chemical Technology(2014- present)
Fellow, Korea Research Institute of Chemical Technology (2007- 2014)
Director, Strategy and Cooperation Division, Korea Research Institute of Chemical Technology (2008-2010)
Professor, Green Chemistry and Environmental Bio-technology, University of Science and Technology (2005- present)
Principal Research Scientist, Head, Membrane and Separation Research Center, Korea Research Institute of Chemical Technology (1990-2007)
Director of Applied & Engineering Chemistry Division, Korea Research Institute of Chemical Technology (2004-2005)
Director, National Research Laboratory for Functional Membranes, Ministry of Science and Technology (2000-2005)
Guest Scientist, Separation Laboratory, National Institute for Materials and Chemical Research, AIST, Japan (1993- 1994)
Senior Research Scientist, Korea Research Institute of Chemical Technology, (1987-1990)
Postdoctoral Research Associate, Center of Excellence on Membrane Technology, University of Cincinnati, Cincinnati, Ohio, USA (1984 - 1987)
Research Scientist, Korea Research Institute of Chemical Technology, (1977 - 1980)

PROFESSIONAL SERVICES

The President of the Membrane Society of Korea (2005)
The Vice president of the Membrane Society of Korea (2002-2004)
The Editor in Chief of Membrane Journal (1991-1993)
The Vice president of the Polymer Society of Korea (2008)
The vice president of the Korean Society of Industrial and Engineering Chemistry (2008)
The President of the Industrial and Engineering Chemistry Division

of the Korean Chemical Society (1999-2002)
ICOM 2005 International Advisory Committee, Chairman (2003-2005)
International Union of Pure and Applied Chemistry(IUPAC), CHEMRAWN Committee member (2004-2013)

AWARDS

National Medal of Science and Technology(2013)
Commander of the Order of the Star of Solidarity of Italian Republic (2008)
Awards for Excellence on Industrial Technology Transfer, Korea Research Institute of Chemical Technology (2006)
Awards for Best Scientific paper, The Membrane Society of Korea (2006)
Awards for Excellence on Research, Korea Research Institute of Chemical Technology (2003)
Grand Prize for Daejeon Economy and Science, Daejeon Metropolitan City (2002)
Best Scientific Papers Awards, Korea Association for Science and Technology (2001).
Presidential Honors for the contribution in Science and Engineering, (1999)
Awards for Excellence on Research, Korea Research Institute of Chemical Technology (1998)
Awards for Excellence on Industrial Technology Transfer, Korea Research Institute of Chemical Technology (1995)
Japanese Government Research Award, MITI, Japan (1993)

PUBLICATUONS

206 research papers, 270 presentation in national and international scientific meetings, 102 national or international patents

Curriculum Vitae

Patrick MOYNA SILVESTRE

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Formación

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Formación académica/Titulación

Posgrado

1965 - 1968 Doctorado

Título: Fotoquímica de Derivados de Benzotropolonas

Tutor/es: Eric J FORBES

Obtención del título: 1968

Palabras clave: Produtos naturais

1965 - 1968 Doctorado

Ph.D. Chemistry

University of Birmingham , Inglaterra

Título: Photochemistry of Diels Alder adducts

Tutor/es: Eric Forbes

Obtención del título: 1968

Becario de: British Council , Gran Bretaña

Palabras clave: Quimica sintetica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica

Especialización

1957 - 1964 Especialización/Perfeccionamiento

Químico Farmacéutico

Facultad de Química - UDeLaR , Uruguay

Obtención del título: 1964

Palabras clave: Titulo profesional

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica

Ciencias Naturales y Exactas / Otras Ciencias Naturales / Otras Ciencias Naturales

Formación en marcha

Formación académica/Titulación

Grado

1957 - 1963 Grado

Formación complementaria

Postdoctorado

1970 - 1971 NRCC Post doctoral fellowship

National Research Council of Canada , Canadá

Palabras clave: Química Polisacáridos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Idiomas

Español

Entiende (Muy Bien) / Habla (Muy Bien) / Lee (Muy Bien) / Escribe (Muy Bien)

Francés

Entiende (Muy Bien) / Habla (Bien) / Lee (Bien) / Escribe (Regular)

Inglés

Entiende (Muy Bien) / Habla (Muy Bien) / Lee (Muy Bien) / Escribe (Muy Bien)

Portugués

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Areas de actuación

Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimiotaxonomia

Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fotoquimica

Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica verde

Actuación Profesional

Cargos desempeñados actualmente

Desde: 05/2002

Profesor, Director DEPTEQ , (30 horas semanales) , Facultad de Química - UDeLaR , Uruguay

Universidad de la República , Facultad de Química - UDeLaR , Uruguay

Vínculos con la institución

11/1968 - 05/1990, *Vínculo:* Profesor de Farmacognosia y Productos Natural, (40 horas semanales)

05/1990 - 05/1998, *Vínculo:* Decano Facultad de Quimica, (40 horas semanales)

05/2002 - Actual, *Vínculo:* Profesor, Director DEPTEQ, (30 horas semanales)

Universidade de Caxias do Sul , Brasil

Vínculos con la institución

05/1998 - 05/2002, *Vínculo:* Profesor de investigacion en el Instituto de, (40 horas semanales / Dedicación total)

Empresa Privada , Laboratorio Fármaco Uruguayo S.A. , Uruguay

Vínculos con la institución

05/1979 - 05/1991, *Vínculo:* director Tecnico, (10 horas semanales)

Producción científica/tecnológica

Mi trabajo en el area de quimica organica ha buscado abrir nuevas lineas de investigacion. Primeramente en productos naturales, con actividad en ceras vegetales, polisacaridos, flavonoides, aceites esenciales y alcaloides. Luego entemas de nuevos metodos analiticos aplicados a quimica organica, en particular uso de tecnicas cromatograficas y rseonancia nuclear magnetica. Por ultimo en reacciones fotoquimicas, estudiando los mecanismos electronicos que expliquen los resultados observados. Actualmente los temas de productos naturales son llevados al frente por profesionales formados en mi grupo, y estoy trabajando con quienes sean posiblemente mis ultimos formados.

Producción bibliográfica

Artículos publicados

Arbitrados

Completo

MOYNA, P.; Añon; Panizzolo; Abirached; Araujo; Medrano
Correlation of average hydrophobicity, water/air interface surface rheological properties and foaming. Food science and technology international, *v.:* 18, *p.:* 187 - 193, 2012
Palabras clave: Rheological; Proteins

Areas del conocimiento: Ciencias Agrícolas / Producción Animal y Lechería / Ciencia Animal y Lechería

Medio de divulgación: Papel ; *Lugar de publicación:* Madrid, España ; *ISSN:* 10820132

http://fst.sagepub.com/content/18/2/187

Completo

MOYNA, P.; Heguaburu; Tabarez; Reina; Franco; Moyna
Dehydration of Carbohydrates to 2-Furaldehydes in Ionic Liquids by Catalysis with Ion Exchange Resins. Catalysis Communications, *v.:* 27, *p.:* 88 - 91, 2012
Palabras clave: líquidos iónicos; azucares; biomasa; hidroximetilfurfural

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica

Medio de divulgación: Papel ; *Lugar de publicación:* Londres ; *ISSN:* 15667367

Completo

MOYNA, P.; Tabarez; Khrisman; Moyna
Mechanistic studies of the formation of cyclopropane-bearing systems through photoconversion of tropolone Diels-Alder adducts. Tetrahedron, *v.:* 68, *p.:* 8622 - 8629, 2012
Palabras clave: fotoquimica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica

Medio de divulgación: Papel ; *Lugar de publicación:* Londres ; *ISSN:* 00404020

Completo

MOYNA, P.; Abirached; Medrano; Araujo; Añon; Panizzolo

Comparison of Interfacial and Foaming properties of Soy and Whey Proteins. Journal of Food Science and Engineering , *v.:* 2012, *p.:* 376 - 381, 2012

Palabras clave: proteinas; propiedades de interfase

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Coloidal / Alimentos

Medio de divulgación: Papel ; *ISSN:* 21595828

Completo

MOYNA, P.; Walter,; Tabarez; Cheng; Moyna

Preparation of substituted dihydrofluorenones by photoisomerization of benzotropolone derivatives. Synthetic Communications, *v.:* 41, *p.:* 2852 - 2858, 2011

Palabras clave: fotoquímica orgánica; fluorenonas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fotoquimica

Medio de divulgación: Papel ; *Lugar de publicación:* Londres ; *ISSN:* 00397911

Completo

MOYNA, P.; Añon; Panizzolo; Medrano; Abirached

The Effect Of Glycation On Oil-Water Emulsion Properties Of Β-Lactoglobulin. Food science and technology international, *v.:* 45, *p.:* 253 - 260, 2011

Palabras clave: lactoglobulina

Areas del conocimiento: Ciencias Agrícolas / Producción Animal y Lechería / Ciencia Animal y Lechería

Medio de divulgación: Papel ; *Lugar de publicación:* Inglaterra ; *ISSN:* 10820132

Completo

MOYNA, P.; Abirached; Medrano; Panizzolo; Añon

Desestabilización de emulsiones aceite-agua preparadas con proteínas de soja. INNOTEC, *v.:* 2011, *p.:* 7 - 10, 2011

Palabras clave: emulsiones

Areas del conocimiento: Ciencias Agrícolas / Producción Animal y Lechería / Ciencia Animal y Lechería

Medio de divulgación: Papel ; *Lugar de publicación:* Montevideo ; *ISSN:* 16883691

Completo

MOYNA, P.; Marcelo; Ana Cristina; Luciana; Eduardo; M.; L.B.; LV.

Efeito fungicida dos óleos essenciais de Schinus molle L. e Schinus terebinthifolius Raddi do Rio Grande do Sul,. Revista brasileira de farmacognosia, *v.:* 20, *p.:* 154 - 159, 2010

Palabras clave: aceite esencial Schinus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Papel ; *ISSN:* 0102695X

Completo

MOYNA, P.; Abirached; Medrano; Panizzolo; Añon

Estabilidad de espumas formuladas con proteínas de soja tratadas a pH ácido. INN@TEC, *v.:* 5, *p.:* 58 - 62, 2010

Palabras clave: proteinas soja

Areas del conocimiento: Ciencias Agrícolas / Producción Animal y Lechería / Ciencia Animal y Lechería

Medio de divulgación: Papel ; *Lugar de publicación:* Montevideo ; *ISSN:* 16883681

Completo

MOYNA, P.; Alejandra; L.A.; Luis; Cristina

The effect of glycation on foam and structural properties of lactoglobulin. Food Chemistry, *v.:* 113, *p.:* 127 - 133, 2009

Palabras clave: lactoglobulina glicosilacion

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica alimentos

Medio de divulgación: Papel ; *Lugar de publicación:* Estados Unidos ; *ISSN:* 03088146


Completo

MOYNA, P.; A.C.; Marcelo; Fabiana; Luciana; P.L.; Rosangela; Eduardo

Chemical composition of the essential oils from leaves and fruits of Schinus molle and Schinus terebinthifolius in Southern Brasil. Journal of Essential Oil Bearing Plants , *v.:* 12, *p.:* 16 - 26, 2009

Palabras clave: aceites esenciales Schinus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *ISSN:* 0972060X


Completo

MOYNA, P.; Natalia; Rogerio; G.F.; Luciana; L.R.; Horacio

Use of Palmae wax hydrocarbon fractions as chemotaxonomical markers in Butia and Syagrus . Brazilian Journal of Biology, *v.:* 62, *p.:* 631 - 637, 2009

Palabras clave: ceras epicuticulares

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* Rio de Janeiro ; *ISSN:* 15196984



Completo

MOYNA, P.; Guillermo; Charles; Carrie; Ashleigh

Synthesis of novel indenoquinolines and indenopyridazines via photoisomerization of benzotropolone derivatives. Tetrahedron Letters, *v.:* 50, *p.:* 7128 - 7131, 2009

Palabras clave: aductos Diels Alder oxazinas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fotoquimica

Medio de divulgación: Papel ; *Lugar de publicación:* Londres ; *ISSN:* 00404039


Completo

MOYNA, P.; Luciana; Gabriel; Ana Cristina; Fabiana

Evaluation of essential oils from Basil from Southern Brazil. Journal of Essential Oil Bearing Plants , *v.:* 12, *p.:* 471 - 475, 2009

Palabras clave: aceites esenciales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel ; *ISSN:* 0972060X


Completo

MOYNA, P.; L.M.; M.I. ; Horacio; Gabriel; Ivan

Lanoline purification by selective extraction of pesticides using supercritical CO2. Journal of Supercritical Fluids, *v.:* 45/2, *p.:* 177 - 180, 2008

Palabras clave: lanolina fluidos supercriticos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / grasas animales

Medio de divulgación: Papel ; *ISSN:* 08968446 ; *Idioma/Pais:* Inglés/Gran Bretaña

Completo

MOYNA, P.; Daniela; Gustavo; Horacio

Novel oxazines with potential antiparasitic activity obtained by Hetero Diels-Alder reactions. Acta Farm. Bonaerense, *v.:* 27, *p.:* 34 - 40, 2008

Palabras clave: hetero Diels Alder oxazinas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / oxazinas

Medio de divulgación: Papel ; *Lugar de publicación:* La Plata ; *ISSN:* 03262383 ; *Idioma/Pais:* Inglés/Argentina

Completo

MOYNA, P.; M.V.; Carmelo; Horacio

Acyl sucrose esters from Salpichroa origanifolia. Natural Product Communications, *v.:* 3, *p.:* 539 - 542, 2008

Palabras clave: acil esteres de azucares

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel ; *Lugar de publicación:* Inglaterra ; *ISSN:* 1934578X

Completo

MOYNA, P.; Diego; R.P. ; Guillermo; Robin

Can ILs dissolve wood?. Green chemistry (Print), *v.:* 9, *p.:* 63 - 68, 2007

Palabras clave: madera liquidos ionicos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / liquidos ionicos

Medio de divulgación: Papel ; *Lugar de publicación:* Gran bretaña ; *ISSN:* 14639262 ; *Idioma/Pais:* Inglés/Gran Bretaña

Completo

MOYNA, P.; Daniela; Horacio

Design, synthesis and evaluation of new oxazines with potential antiparasitic activity. Tetrahedron Letters, *v.:* 48, *p.:* 2505 - 2507, 2007

Palabras clave: aductos Diels Alder oxazinas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / hetero Diels Alder aductos

Medio de divulgación: Papel ; *Lugar de publicación:* Gran Bretaña ; *ISSN:* 00404039 ; *Idioma/Pais:* Inglés/Gran Bretaña

Completo

MOYNA, P.; Luciana; A.C.; Marcelo; Fabiana; P.L.; Eduardo

Avaliaçao quimica mensal de tres ejemplares de Schinus terebinthifolius. Revista Brasileira de Biociências, *v.:* 5 2, *p.:* 1011 - 1013, 2007

Palabras clave: aceite esencial Schinus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Porto Alegre, BR ; *ISSN:* 19804849

Completo

MOYNA, P.; A.C.; Marcelo; Fabiana; M.L.; G.F.; Luciana; Eduardo

Caracterizaçao quimica de populaçoes de Schinus molle do Rio Grande do Sul. Revista Brasileira de Biociências, *v.:* 5 2, *p.:* 1014 - 1016, 2007

Palabras clave: aceite esencial Schinus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Porto Alegre, BR ; *ISSN:* 19804849

Completo

MOYNA, P.; Veronica; C.D.; Horacio

Morphological diversity in Type IV glandular trichomes of Solanaceae. EJB Electronic Journal of Biotechnology, *v.:* 9, *p.:* 281 - 285, 2006

Palabras clave: esteres azucares solanaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / cderas epicuticulares

Medio de divulgación: Internet ; *Lugar de publicación:* Valparaiso ; *ISSN:* 07173458 ; *Idioma/Pais:* Inglés/Chile



Completo

MOYNA, P.; Diego; R.P. ; Robin; Guillermo

Use of ILs in the study of fruit ripening. Chemical Communications, *p.:* 714 - 716, 2006

Palabras clave: liquidos ionicos polisacaridos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Gran Bretaña ; *ISSN:* 13597345 ; *Idioma/Pais:* Inglés/Gran Bretaña


Completo

MOYNA, P.; A.C.; Marcelo; G.F.; L.R.; Juarez; Marcia; Fabiana

Physico chemical evaluation of Rosmarinus officinalis essential oils. Brazilian Archives of Biology and Technology, *v.:* 48, *p.:* 1035 - 1039, 2005

Palabras clave: aceite esencial rosmarinus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *ISSN:* 03650979 ; *Idioma/Pais:* Inglés/Brasil

Completo

MOYNA, P.; A.C.; Marcelo; Luciana; E.A.

Extraction of essential oils from Lime. Brazilian Archives of Biology and Technology, *v.:* 48, *p.:* 155 - 160, 2005

Palabras clave: aceite esencial lima

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *ISSN:* 03650979 ; *Idioma/Pais:* Inglés/Brasil

Completo

MOYNA, P.; Bernardo; Amilcar; Fernando

Giovanni Marini Bettolo. su incidencia en el desarrollo de la quimica en Uruguay. História, Ciências, Saúde-Manguinhos, *v.:* 12, *p.:* 535 - 546, 2005

Palabras clave: Marini-Bettolo Quimica Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / Historia Quimica Uruguay

Medio de divulgación: Papel ; *Lugar de publicación:* Manguinhos ; *ISSN:* 01045970 ; *Idioma/Pais:* Español/Brasil



Completo

MOYNA, P.; Luciana; A.C.; Marcia; Natalia

Seasonal variation of essential oils of Thymus vulgaris from South Brazil. Journal of Essential Oil Research, *v.:* 16, *p.:* 294 - 295, 2004

Palabras clave: aceite esencial tomillo

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* estados unidos ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; Lilian; A.C.; Luciana

Influence of rootstock on essential oil compositions of mandarins. Acta Farm. Bonaerense, *v.:* 23, *p.:* 498 - 502, 2004

Palabras clave: aceites esenciales mandarina

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Buenos Aires ; *ISSN:* 03262383 ; *Idioma/Pais:* Inglés/Argentina



Completo

MOYNA, P.

The scientific journey of Marini Bettolo from Italy to Uruguay. Chemistry International , *v.:* 26, *p.:* 11 - 13, 2004

Palabras clave: historia quimica Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / Historia

Medio de divulgación: Papel ; *ISSN:* 01936484 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; Edson; Regina; J.L.

Ethyl carbamate content in wines produced and commercialized in southern Brasil. Acta Farm. Bonaerense, *v.:* 21, *p.:* 201 - 204, 2002

Palabras clave: vinos carbamato de etilo

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis vinos

Medio de divulgación: Papel ; *ISSN:* 03262383 ; *Idioma/Pais:* Inglés/Argentina



Completo

MOYNA, P.; Luciana; Marcia; A.C.; Marcelo; G.F.; L.R.; Natalia

Variation in essential oil yield in Lippia alba. Revista brasileira de plantas medicinais, *v.:* 4, *p.:* 72 - 74, 2002

Palabras clave: aceites esenciales Lippia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / acaeites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Botucatu ; *ISSN:* 15160572 ; *Idioma/Pais:* Inglés/Brasil

Completo

MOYNA, P.; C. ; G.; Horacio

Allelopathic activity of Ammi majus fruit waxes. Chemoecology, *v.:* 12, *p.:* 107 - 111, 2002

Palabras clave: actividad alelopatica Ammi majus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* Basilea ; *ISSN:* 09377409 ; *Idioma/Pais:* Inglés/Suiza


Completo

MOYNA, P.; Pilar; C. ; P.; Horacio

Enzymatic systems involved in limonene biooxidation. Brazilian Archives of Biology and Technology, *v.:* 45, *p.:* 1113 - 114, 2002

Palabras clave: biotransformacion limoneno

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Brazil ; *ISSN:* 03650979 ; *Idioma/Pais:* Inglés/Brasil

Completo

MOYNA, P.; Natalia; L.R.; Caren; A.C.; Adriana; Luciana

Chemical composition of volatiles of Angelica root obtained by hydrodistillation and supercritical extraction. Journal of Essential Oil Research, *v.:* 14, *p.:* 282 - 285, 2002

Palabras clave: aceites esenciales angelica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; Caren; Luciana; Eduardo; Daniel

Essential oil of Baccharis uncinella. Flavour and Fragrance Journal, *v.:* 16, *p.:* 286 - 288, 2001

Palabras clave: aceites esenciales baccharis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *ISSN:* 08825734 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; H. ; Guillermo; Daniela; Horacio; S.S.; S.A.

Design, Synthesis and Biological evaluation of a series of simple and novel potential antimalarials. Bioorganic & Medicinal Chemistry Letters, *v.:* 11, *p.:* 1851 - 1854, 2001

Palabras clave: Aductos Diels Alder

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / hetero Diels Alder Actividades

Medio de divulgación: Papel ; *ISSN:* 0960894X ; *Idioma/Pais:* Inglés/Gran Bretaña

Completo

MOYNA, P.; S.; Daniela; Horacio; Raul; Leopoldo; Ricardo; E.; Alvaro Mombru

4,5,6,9-tetramethoxy-11-phenyl-10-oxa-11-azatricyclo{7.2.2.0]trideca-2(7),3,5,12-tetraen-8-one. Acta Crystallographica. Section E, Structure Reports Online (electrónica), *v.:* 57, *p.:* 444 - 446, 2001

Palabras clave: estructura aducto

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / Reaccion Diels Alder Estructuras

Medio de divulgación: Papel ; *ISSN:* 16005368 ; *Idioma/Pais:* Inglés/Gran Bretaña

Completo

MOYNA, P.; Daniela; Eduardo; Nestor; Horacio; Eric

Hetero Diels Alder adduct formation between nitrosobenzene and tetramethyl purpurogallin. Journal of the Brazilian Chemical Society, *v.:* 12, *p.:* 489 - 492, 2001

Palabras clave: Aducto Diels Alder

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / Reaccion Diels Alder

Medio de divulgación: Papel ; *ISSN:* 01035053 ; *Idioma/Pais:* Inglés/Brasil

Completo

MOYNA, P.; Horacio

Improving self defence in plants. Pure and Applied Chemistry, *v.:* 73, *p.:* 1325 - 1330, 2001

Palabras clave: quimica proteccion vegetal

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / proteccion vegetal

Medio de divulgación: Papel ; *ISSN:* 00334545 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; Ines; L.; Caren; Daniel; Eduardo

Asaricin the main component of ocotea essential oil. Natural Product Letters, *v.:* 15, *p.:* 163 - 170, 2001

Palabras clave: asaricina aceite esencial

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceite esencial

Medio de divulgación: Papel ; *ISSN:* 10575634 ; *Idioma/Pais:* Inglés/Gran Bretaña

Completo

MOYNA, P.; Silvia; Helena; Horacio; Eduardo; Raul; Leopoldo; Alvaro

1,4,4-trimethyl-9-phenyl-8-oxa-azabicyclo[3.2.2]non-6-en-2-one. Acta Crystallographica Section C-Crystal Structure Communications, *v.:* 56, *p.:* 672 - 673, 2000

Palabras clave: eucarvone adduct

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / estructura aductos

Medio de divulgación: Papel ; *Lugar de publicación:* Gran Bretaña ; *ISSN:* 01082701 ; *Idioma/Pais:* Inglés/Gran Bretaña


Completo

MOYNA, P.; Luciana; Eduardo; Caren; Daniel; Natalia; D.; A.C.

Achyrocline satureioides essential oils from Southern Brazil and Uruguay. Planta Medica, *v.:* 66, *p.:* 476 - 477, 2000

Palabras clave: Achyrocline aceites esenciales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* stuttgart ; *ISSN:* 00320943 ; *Idioma/Pais:* Inglés/Alemania


Completo

MOYNA, P.; Sonia; Veronica; Horacio

Determination of phospholipid/lipophilic compiounds ration in liposomes by TLC Scanning densitometry. Lipids, *v.:* 35 9, *p.:* 1033 - 1036, 2000

Palabras clave: lipidos TLC

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis lipidos

Medio de divulgación: Papel ; *Lugar de publicación:* Washington ; *ISSN:* 00244201 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; Caren; A.C.; Natalia; Luciana; Eduardo; Daniel

Essential oils of Camphor tree cultivated in southern Brazil. Brazilian Archives of Biology and Technology, *v.:* 43 3, *p.:* 313 - 316, 2000

Palabras clave: esencia canforero

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Parana ; *ISSN:* 03650979 ; *Idioma/Pais:* Inglés/Brasil

Completo

MOYNA, P.; Maria Pia; J.; Matilde; Silvana; Fernando; Ivette; Alvaro

Antibacterial compound from Ibicella lutea. Journal of Ethnopharmacology, *v.:* 73, *p.:* 521 - 525, 2000

Palabras clave: Ibicella glicosidos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicosidos antibioticos

Medio de divulgación: Papel ; *Lugar de publicación:* Irlanda ; *ISSN:* 03788741 ; *Idioma/Pais:* Inglés/Irlanda


Completo

MOYNA, P.; Silvia; Carlos; Alvaro; V; Fernando

Aphid repellent glycoside from Solanum laxum. Phytochemistry, *v.:* 55, *p.:* 217 - 222, 2000

Palabras clave: glicoalcaloides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicosidos

Medio de divulgación: Papel ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Gran Bretaña


Completo

MOYNA, P.; Pilar; Carmen; Selva; Matilde; Horacio

Biotransformation of limonene by Pseudomonas aeruginosa and Streptococcus faecalis. Anales de la Asociacion Quimica Argentina, *v.:* 88, *p.:* 79 - 82, 2000

Palabras clave: biotransformacion limoneno

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / biotransformacion terpenos

Medio de divulgación: Papel ; *ISSN:* 03650375 ; *Idioma/Pais:* Inglés/Argentina


Completo

MOYNA, P.; Juarez; CD; Luciana; Daniel; Eduardo

Composicion quimica de aceite esencial de menta italo mitcham. Horticultura Brasileira, *v.:* 18, *p.:* 1008 - 1009, 2000

Palabras clave: aceite esencial menta

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Brasil ; *ISSN:* 01020536 ; *Idioma/Pais:* Portugués/Brasil

Completo

MOYNA, P.; Carlos; Alvaro; Gabriel; A.; Fernando

Effect of Solanum glycoalkaloids on the potato aphid. Journal of Chemical Ecology, *v.:* 26, *p.:* 1113 - 1121, 2000

Palabras clave: glicoalcaloides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicoalcaloides

Medio de divulgación: Papel ; *ISSN:* 00980331 ; *Idioma/Pais:* Inglés/Gran Bretaña


Completo

MOYNA, P.

Composicion quimica de la esencia de menta Italo Mitcham cultivada en el Sur de Brasil y Uruguay. Horticultura Brasileira, *v.:* 18, *p.:* 1008 - 1009, 2000

Palabras clave: aceites esenciales menta

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *ISSN:* 01020536 ; *Idioma/Pais:* Portugués/Brasil

Completo

MOYNA, P.; E Dellacassa; D Lorenzo; CD Frizzo; LA Serafini; P Dugo

Rosmarinus officinalis L. (Labiatae) Essential oils from the South of Brazil and Uruguay.. Journal of Essential Oil Research, *v.:* 11, *p.:* 27 - 30, 1999

Palabras clave: oleos essencias; Rosmarinus officinalis; Southern Brazil; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Carol Stream ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; S Soulé; C Guntner; A Vázquez; VH Argandona; F Ferreira

Effect of solanum glycosides on the aphid Schizaphis graminum. Journal of Chemical Ecology, *v.:* 25, *p.:* 369 - 375, 1999

Palabras clave: Solanum; glicosidos; afidos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicoalcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 00980331 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; C Guntner; C Barra; MV Cesio; E Dellacassa; L Ferrando; F Ferreira; C García; G González; H.Heinzen; A Lloret; D Lorenzo; P Menéndez; D Paz; S Soulé; A Vázquez

Antioxidant properties of Solidago chilensis flavonoids. Acta Horticulturae, *v.:* 501, *p.:* 159 - 162, 1999

Palabras clave: Solidago chilensis; antioxidantes; flavonoides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / flavonoides

Medio de divulgación: Papel ; *Lugar de publicación:* Amsterdam ; *ISSN:* 05677572 ; *Idioma/Pais:* Inglés/Holanda

Completo

MOYNA, P.; A Vázquez; F Ferreira; L Kenne

Structural determination of glycosides of steroidal alkaloids from Solanum amygdalifolium.. Phytochemical Analysis, *v.:* 10, *p.:* 194 - 197, 1999

Palabras clave: Alcaloides esteroidales; structural analysis; Solanum amygdalifolium; glicoalcaloides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicoalcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 09580344 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; E Boido; E Dellacassa; F Carrau

Improved Method to Follow Malolactic Fermentation in Wines by TLC-Densitometry. Journal Of Planar Chromatography, Modern T L C, *v.:* 12, *p.:* 269 - 271, 1999

Palabras clave: tlc-densitometry; fermentacion malolactica; vinhos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / metodos cromatograficos

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 09334173 ; *Idioma/Pais:* Inglés/Hungría


Completo

MOYNA, P.; H.Heinzen; R Martinez

Resolution of E/Z mixtures. Anales de la Asociacion Quimica Argentina, *v.:* 87, *p.:* 105 - 110, 1999

Palabras clave: EZ mixtures; enzymatic resolution

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / metodos analiticos

Medio de divulgación: Papel ; *Lugar de publicación:* Buenos Aires ; *ISSN:* 03650375 ; *Idioma/Pais:* Inglés/Argentina


Completo

MOYNA, P.; C García; S Garcia; H.Heinzen; HM Niemeyer

An Efficient Method for the Quantification of Hydroxamic Acids From Cereals by Thin Layer Chromatography -Densitometry . Phytochemical Analysis, *v.:* 9, *p.:* 278 - 282, 1998

Palabras clave: tlc-densitometry; cereales; acidos hidroxamicos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 09580344 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; B Campisi; E Dellacassa; A Verzera; L Favretto

A classification of uruguayan essential oils according to lemon cultivar using linear discriminant analysis. . Journal of commodity science , *v.:* 37, *p.:* 69 - 82, 1998

Palabras clave: oleos essenciais; Uruguay; discriminant analysis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *ISSN:* 19714483 ; *Idioma/Pais:* Inglés/Italia

. J.Commodity Sci. (Riv.Merceol.)37, 69-82 (1998).

Completo

MOYNA, P.

Tomando helados y haciendo quimica. Aldeq - Anuario Latinoamericano de Educación Química, *v.:* 10, *p.:* 37 - 43, 1998

Palabras clave: Quimica alimentos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel ; *Lugar de publicación:* Buenos Aires ; *ISSN:* 0328087X ; *Idioma/Pais:* Español/Argentina

Completo

MOYNA, P.; F Ferreira; A Vázquez; C Guntner

Inhibition of the passive diffusion of cholic acid by the Ilex paraguariensis St. Hil saponins. . Phytotherapy Research, *v.:* 11, *p.:* 79 - 81, 1997

Palabras clave: Ilex paraguariensis; saponins; acidos biliares

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / saponinas mate

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 0951418X ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; S Garcia; C García; H.Heinzen

Chemical basis of the resistance of cereal seeds to fungi. Phytochemistry, *v.:* 44, *p.:* 415 - 418, 1997

Palabras clave: fungos; cereales; sementes; resistencia a fungos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; E Dellacassa; D Lorenzo; A Verzera; A Cavazza

Uruguayan essential oils V. Composition of bergamot oil. . Journal of Essential Oil Research, *v.:* 9, *p.:* 419 - 426, 1997

Palabras clave: oleos essencias; Uruguay; bergamota

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Carol Stream ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; A Vázquez; G González; F Ferreira; L Kenne

Glycoalkaloids of Solanum commersonii. Euphytica, *v.:* 95, *p.:* 195 - 201, 1997

Palabras clave: glicoalcaloides; Solanum commersonii

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicoalcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Amsterdam ; *ISSN:* 00142336 ; *Idioma/Pais:* Inglés/Holanda


Completo

MOYNA, P.; Gunthner; A González; R DosReis; G González; A Vázquez; F Ferreira

Effect of solanum Glycoalkaloids on the Potato Aphid. Journal of Chemical Ecology, *v.:* 23, *p.:* 1651 - 1659, 1997

Palabras clave: glicoalcaloides; Solanum; afidos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicoalcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 00980331 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; E Dellacassa; D Lorenzo; A Verzera; L Mondello; P Dugo

Uruguayan essential oils VI. Composition of Lemon Oils. . Flavour and Fragrance Journal, *v.:* 12, *p.:* 247 - 255, 1997

Palabras clave: oleos essencias; limon; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 08825734 ; *Idioma/Pais:* Inglés/Gran Bretaña


Completo

MOYNA, P.; S Soulé; A Vázquez; G González; F Ferreira

Preparative isolation of steroidal glyco-alkaloids from Solanum tuberosum by MPLC. Potato Research, *v.:* 40, *p.:* 413 - 416, 1997

Palabras clave: Alcaloides esteroidales; glicoalcaloides; isolamento preparativo; MPLC

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicoalcaloides analisis

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 00143065 ; *Idioma/Pais:* Inglés/Holanda

Completo

MOYNA, P.; S Rodriguez; HA Garda; H.Heinzen

Effect of plant monofunctional triterpenes on the Dynamic and Structural Properties of DPPC liposomes. Chemistry and Physics of Lipids, *v.:* 89, *p.:* 119 - 130, 1997

Palabras clave: monofunctional triterpenes; dynamic properties; liposomes; activity

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / triterpenos actividad bicapas

Medio de divulgación: Papel ; *Lugar de publicación:* Shannon ; *ISSN:* 00093084 ; *Idioma/Pais:* Inglés/Irlanda


Completo

MOYNA, P.; Rossini C; P Menéndez; E Dellacassa

Essential oils from leaves of Schinus molle and S. lentescifolius. Journal of Essential Oil Research, *v.:* 8, *p.:* 71 - 73, 1996

Palabras clave: oleos essenciais; folhas; Schinus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Carol Stream ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; I Olano; E Alonso Paz; MP Cerdeiras; J Fernández; F Ferreira; M Soubes; A Vezquez; S Vero; MJ Bassagoda
Screening of Uruguayan medicinal plants for antimicrobial activity. Part II.. Journal of Ethnopharmacology, *v.:* 53, *p.:* 111 - 115, 1996

Palabras clave: antimicrobiano; plantas medicinales; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / plantas medicinales

Medio de divulgación: Papel ; *Lugar de publicación:* Dublin ; *ISSN:* 03788741 ; *Idioma/Pais:* Inglés/Irlanda

Completo

MOYNA, P.; F Ferreira; S Soulé; A Vázquez; L Kenne

Structural studies on glycosides from Solanum laxum Steud. Phytochemistry, *v.:* 42, *p.:* 1409 - 1416, 1996

Palabras clave: glicosidos; Solanum laxum; structural analysis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / saponinas glicosidos

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra

Completo

MOYNA, P.; H.Heinzen; JX DeVries; G Remberg; R Martinez; LF Tietze
Mass Spectrometry of labelled triterpenoids. Thermospray and EI analysis.. Phytochemical Analysis, *v.:* 7, *p.:* 237 - 244, 1996

Palabras clave: triterpenes; labelling; MS

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / triterpenos MS

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 09580344 ; *Idioma/Pais:* Inglés/Inglaterra

Completo

MOYNA, P.; V Cesio; H.Heinzen; C Servetto; M Torres
Lactose intolerance detection by TLC-densitometry. Química Analítica (Sind. Nac. Ind. Química - Madrid), *v.:* 15, *p.:* 140 - 143, 1996

Palabras clave: tlc-densitometry; lactose intolerance

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis azucares

Medio de divulgación: Papel ; *Lugar de publicación:* Barcelona ; *ISSN:* 02104334 ; *Idioma/Pais:* Inglés/España

Completo

MOYNA, P.; H.Heinzen; S Rodriguez
A simple experiment on phase transitions of lipid bilayers using simple and ready to use device of temperature control. Aldeq - Anuario Latinoamericano de Educación Química, *v.:* 8, *p.:* 18 - 25, 1996

Palabras clave: lipid bilayers; phase transitions

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis bicapas lipidicas

Medio de divulgación: Papel ; *Lugar de publicación:* Buenos Aires ; *ISSN:* 0328087X ; *Idioma/Pais:* Inglés/Argentina

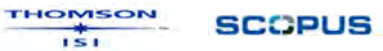
Completo

MOYNA, P.; E Dellacassa; Rossini C; D Lorenzo; A Verzera; A Trozzi; G Dugo
Uruguayan essential oils. Part III. Composition of the volatile fraction of lemon essential oil. Journal of Essential Oil Research, *v.:* 7, *p.:* 25 - 37, 1995

Palabras clave: oleos essencias; citrus; limon

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Carol Stream ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos



Completo

MOYNA, P.; Rossini C; E Pandolfi; E Dellacassa

Determination of 1,8-cineol in Eucalyptus Essential Oils by TLC-densitometry. Journal of AOAC International, *v.:* 78, *p.:* 115 - 117, 1995

Palabras clave: 1 8-cineol; tlc-densitometry; Eucalyptus; oleos essencias

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Washington ; *ISSN:* 10603271 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; E Alonso Paz; MP Cerdeiras; J Fernández; F Ferreira; M Soubes; A Vezquez; S Vero; L Zunino

Screening of Uruguayan medicinal plants for antimicrobial activity. Journal of Ethnopharmacology, *v.:* 45, *p.:* 67 - 70, 1995

Palabras clave: actividad antimicrobiana; plantas medicinais; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / plantas medicinales

Medio de divulgación: Papel ; *Lugar de publicación:* Dublin ; *ISSN:* 03788741 ; *Idioma/Pais:* Inglés/Irlanda


Completo

MOYNA, P.; D Davyt; E Pandolfi; H.Heinzen; L Troche

TLC-Scanning of Wheat Seed Waxes. Anales de la Asociacion Quimica Argentina, *v.:* 83, *p.:* 1 - 5, 1995

Palabras clave: tlc-densitometry; trigo; ceras epicuticulares; semillas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* Buenos Aires ; *ISSN:* 03650375 ; *Idioma/Pais:* Inglés/Argentina

Completo

MOYNA, P.; S Garcia; H.Heinzen; C Hubbuch; R Martinez; X DeVries

Triterpene methyl ethers from Palmae epicuticular waxes. . Phytochemistry, *v.:* 39, *p.:* 1381 - 1382, 1995

Palabras clave: Palmae; epicuticular waxes; triterpene methyl ethers; MS

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; K Cless; JL Schlottfeldt; M Pasqual; JAP Henriques; M Wajner

Inhibition of in vitro Lymphocyte transformation by the isoquinoline alkaloid berberine.. Journal of Pharmacy and Pharmacology, *v.:* 47, *p.:* 1029 - 1031, 1995

Palabras clave: Lymphocyte transformation; berberine

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / actividad alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00223573 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; Daniel

Lab improvement with fun. Journal of Chemical Education, *v.:* 72, *p.:* 1146 - 1146, 1995

Palabras clave: apoyos laboratorio

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / materiales laboratorio

Medio de divulgación: Papel ; *Lugar de publicación:* Washington ; *ISSN:* 00219584 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; E Dellacassa; G Mahler; D Swedzki; E Alonso; M Maffei
New chemotypes of Origanum x applii (Domin) Boros from Uruguay. Journal of Essential Oil Research, *v.:* 6, *p.:* 389 - 393, 1994

Palabras clave: oleos essenciais; Origanum vulgare; quimiotipos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Carol Stream ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos

THOMSON ISI SCOPUS

Completo

MOYNA, P.; LA Serafini; AJP Dillon; ITM Pistoriello

Effect of quinine sulphate on Saccharomyces cereviseae strains. Acta Farm. Bonaerense, *v.:* 13, *p.:* 61 - 64, 1994

Palabras clave: Saccharomyces cerevisae; quinine

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides actividad

Medio de divulgación: Papel ; *Lugar de publicación:* Buenos Aires ; *ISSN:* 03262383 ; *Idioma/Pais:* Inglés/Argentina

THOMSON ISI SCOPUS latindex

Completo

MOYNA, P.; E Dellacassa; D Lorenzo; Rossini C; A Cotroneo; I Stagno D'alcontres; G Dugo
Gli olii essenziali dell´Uruguay. Nota IV. La composizione della frazione volatile di alcune variet di limone. Essenze e Derivati Agrumari, *v.:* 64, *p.:* 45 - 54, 1994

Palabras clave: limon; oleos essencias; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Roma ; *ISSN:* 00140902 ; *Idioma/Pais:* Italiano/Italia

Completo

MOYNA, P.; Rossini C; E Dellacassa
Comparative study of the leaf oils of Psidium incanum and P.luridum. Journal of Essential Oil Research, *v.:* 6, *p.:* 513 - 515, 1994

Palabras clave: oleos essencias; Psidium

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Carol Stream ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos

THOMSON ISI SCOPUS

Completo

MOYNA, P.; F Ferreira; A Vázquez; L Kenne

Foliumin, a spirosten lactone saponin from Solanum amygdalifolium. Phytochemistry, *v.:* 36, *p.:* 1473 - 1478, 1994

Palabras clave: Solanum amygdalifolium; foliumin; spirosten lactone

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis saponinas

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra

THOMSON ISI SCOPUS

Completo

MOYNA, P.; M Salvador; CP Lauer; JAP Henriques
Genotoxicity of the isoquinoline alkaloid berberine in prokaryotic and eukariotic organisms. Mutation Research Letters, *v.:* 286, *p.:* 243 - 252, 1993

Palabras clave: berberine; genotixicidade; procariotes; eucariotes

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / genotoxicidad alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Amsterdam ; *ISSN:* 01657992 ; *Idioma/Pais:* Inglés/Holanda

SCOPUS

Completo

MOYNA, P.; S Garcia; H.Heinzen; R Martinez

Identification of flavonoids by TLC densitometry. Chomatographia, *v.:* 35, *p.:* 430 - 434, 1993

Palabras clave: tlc-densitometry; flavonoides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis flavonoides

Medio de divulgación: Papel ; *Lugar de publicación:* Basel ; *ISSN:* 00095893 ; *Idioma/Pais:* Inglés/Alemania


Completo

MOYNA, P.; H.Heinzen

Activity of wax constituents on denatured cellular structures. Phyton - International Journal of Experimental Botany BA Argentina, *v.:* 54, *p.:* 51 - 58, 1993

Palabras clave: componentes; ceras; accion biologica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / actividad componentes ceras

Medio de divulgación: Papel ; *Lugar de publicación:* Vicente Lopez ; *ISSN:* 00319457 ; *Idioma/Pais:* Inglés/Argentina

Completo

MOYNA, P.; E Dellacassa; R Martinez

Determinación espectrodensométrica de o-fenil-fenol, imazalil y tiabendazol residuales en cítricos.. Journal Of Planar Chromatography, Modern T L C, *v.:* 6, *p.:* 326 - 327, 1993

Palabras clave: tlc-densitometry; pesticidas; citricos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis pesticidas

Medio de divulgación: Papel ; *Lugar de publicación:* Frankfurt ; *ISSN:* 09334173 ; *Idioma/Pais:* Inglés/Hungría

Completo

MOYNA, P.; A González; F Ferreira; A Vázquez; E Alonso Paz

Biological Screening of Uruguayan Medicinal Plants. Journal of Ethnopharmacology, *v.:* 39, *p.:* 217 - 220, 1993

Palabras clave: Uruguay; plantas medicinales; screening biologico

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / plantas medicinales

Medio de divulgación: Papel ; *Lugar de publicación:* Dublin ; *ISSN:* 03788741 ; *Idioma/Pais:* Inglés/Irlanda


Completo

MOYNA, P.; F Ferreira; S Soulé; A Vázquez

Rapid quantitative determination of Solanum glycoalkaloids by TLC-Scanning. Journal of Chromatography - A, *v.:* 653, *p.:* 380 - 384, 1993

Palabras clave: tlc-densitometry; Solanum; glicoalcaloides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis glicoalcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Amsterdam ; *ISSN:* 00219673 ; *Idioma/Pais:* Inglés/Holanda


Completo

MOYNA, P.; E Dellacassa; Rossini C; P Menéndez; A Verzera; A Trozzi; G Dugo

Composition of oils of some varieties of Mandarin.. Journal of Essential Oil Research, *v.:* 4, *p.:* 265 - 272, 1992

Palabras clave: oleos essencias; citrus; mandarinas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Carol Stream ; *ISSN:* 10412905 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; F Ferreira

Simple TLC-GC method for semi-quantitative separation of lipids. Journal of Liquid Chromatography, *v.:* 15, *p.:* 1655 - 1663, 1992

Palabras clave: tlc-densitometry; lipidos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / lipidos analisis

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 01483919 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; Rossini C; R Martinez; E Dellacassa

Determination of citral in Citrus Essential oils by TLC-densitometry. Journal Of Planar Chromatography, Modern T L C, *v.:* 4, *p.:* 259 - 261, 1991

Palabras clave: citrus; oleos essenciais; tlc-densitometry

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales analisis

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 09334173 ; *Idioma/Pais:* Inglés/Hungría

Completo

MOYNA, P.; E Dellacassa; G Dugo; A Di Giacomo

Los aceites esenciales cítricos del Uruguay. Nota preliminar. . Essenze e Derivati Agrumari, *v.:* 61, *p.:* 16 - 31, 1991

Palabras clave: oleos essencias; citricos; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Roma ; *ISSN:* 00140902 ; *Idioma/Pais:* Español/Italia

Completo

MOYNA, P.; E Dellacassa; Rossini C; I Stagno D'alcontres; L Mondello; G Dugo

Los aceites esenciales del Uruguay. Nota II.. Essenze e Derivati Agrumari, *v.:* 61, *p.:* 291 - 304, 1991

Palabras clave: citrus; limon; oleos essencias; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Roma ; *ISSN:* 00140902 ; *Idioma/Pais:* Italiano/Italia

Completo

MOYNA, P.; D Davyt; E Dellacassa; F Ferreira; P Menéndez; A Vázquez

Phytochemical screening of uruguayan medicinal plants. Fitoterapia, *v.:* 62, *p.:* 519 - 521, 1991

Palabras clave: plantas medicinais; screening biologico

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / plantas medicinales

Medio de divulgación: Papel ; *Lugar de publicación:* Milano ; *ISSN:* 0367326X ; *Idioma/Pais:* Inglés/Italia

Completo

MOYNA, P.; LF Tietze; H.Heinzen; M Rischer; H Neunaber

Labelling of betulin with 2H and 13C for biological transformations. Liebigs Annalen/Recueil, *v.:* 1991, *p.:* 1245 - 1249, 1991

Palabras clave: betulina; labelling; 2H; C-13; biotransformaciones

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / triterpenos semisintesis

Medio de divulgación: Papel ; *Lugar de publicación:* Weinheim ; *ISSN:* 09473440 ; *Idioma/Pais:* Inglés/Alemania

Completo

MOYNA, P.; E Dellacassa; P Menéndez; E Soler

Chemical composition of Eucalyptus essential oils grown in Uruguay. Flavour and Fragrance Journal, *v.:* 5, *p.:* 91 - 95, 1990

Palabras clave: oleos essenciais; Eucalyptus; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / acaeites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 08825734 ; *Idioma/Pais:* Inglés/Gran Bretaña


Completo

MOYNA, P.; E Dellacassa; E Soler; P Menéndez

Essential oils from Lippia alba and Aloysia chamaedrifolia. Flavour and Fragrance Journal, *v.:* 5, *p.:* 107 - 108, 1990

Palabras clave: oleos essenciais; Aloysia chamaedrifolia; Lippia alba

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / acaeites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 08825734 ; *Idioma/Pais:* Inglés/Gran Bretaña


Completo

MOYNA, P.; H.Heinzen; F Ferreira; A Vázquez

Conical thin layer chromatography. Journal of Chemical Education, *v.:* 67, *p.:* 167 - 168, 1990

Palabras clave: TLC

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / cromatografia ceras

Medio de divulgación: Papel ; *Lugar de publicación:* Washington ; *ISSN:* 00219584 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; R Martinez

TLC-scanning for direct quantitation of natural waxes. Journal of Liquid Chromatography, *v.:* 13, *p.:* 1959 - 1965, 1990

Palabras clave: tlc-densitometry; quantitative; ceras vegetales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / cromatografia ceras

Medio de divulgación: Papel ; *Lugar de publicación:* New York ; *ISSN:* 01483919 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; M Salvador; JL Carrau

Studies on the use of alkaloids for the selective inhibition of wine yeasts. Revista de Microbiologia, *v.:* 20, *p.:* 466 - 469, 1989

Palabras clave: alcaloides; inhibicion selectiva; levaduras; vinhos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Sao Paulo ; *ISSN:* 00013714 ; *Idioma/Pais:* Inglés/Brasil


Completo

MOYNA, P.; E Dellacassa; P Menéndez; P Cerdeiras

Antimicrobial activity of Eucalyptus essential oils. Fitoterapia, *v.:* 60, *p.:* 544 - 5467, 1989

Palabras clave: oleos essencias; Eucalyptus; actividad antimicrobiana

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Milano ; *ISSN:* 0367326X ; *Idioma/Pais:* Inglés/Italia


Completo

MOYNA, P.; H.Heinzen

Surface waxes from seeds of Hordeum vulgare. Phytochemistry, *v.:* 27, *p.:* 429 - 431, 1988

Palabras clave: ceras epicuticulares; seeds; Hordeum vulgare

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; PI Rivas; H.Heinzen; HM Niemeyer

Composición química de la cera epicuticular de Dasyphyllum excelsum. Revista latinoamericana de quimica, *v.:* 19, *p.:* 34 - 35, 1988

Palabras clave: ceras epicuticulares; Dasyphyllum; Compositae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* Mexico ; *ISSN:* 03705943 ; *Idioma/Pais:* Español/México

Completo

MOYNA, P.; E Manta; H.Heinzen

Epicuticular waxes from seeds of Uruguayan grasses. Acta Farm. Bonaerense, *v.:* 6, *p.:* 83 - 86, 1987

Palabras clave: epicuticular waxes; sementes; Poaceae; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* Buenos Aires ; *ISSN:* 03262383 ; *Idioma/Pais:* Inglés/Argentina


Completo

MOYNA, P.; J Pronczuk; A Laborde; L Heuhs; L Romaniello; A Vázquez

Mate drinking. another source of caffeine. Veterinary and Human Toxicology, *v.:* 29, *p.:* 70 - 71, 1987

Palabras clave: mate; cafeina

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides mate

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 01456296 ; *Idioma/Pais:* Inglés/Inglaterra

Completo

MOYNA, P.; Horacio Heinzen

Why was the fleece golden. Nature, *v.:* 330, *p.:* 28 - 28, 1987

Palabras clave: tetraterpenos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / terpenos

Medio de divulgación: Papel ; *Lugar de publicación:* Londres ; *ISSN:* 00280836 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; MA Grompone

Geometric isomerization of fatty acids with nickel catalysts. Journal of the American Oil Chemists Society (JAOCS), *v.:* 63, *p.:* 550 - 551, 1986

Palabras clave: acidos grasos; isomerizacion cis trans; catalizador de niquel

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / acidos grasos

Medio de divulgación: Papel ; *Lugar de publicación:* Washington ; *ISSN:* 0003021X ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; E Soler; E Dellacassa

Composition of Aloysia grattisima leaf essential oil. Phytochemistry, *v.:* 25, *p.:* 1343 - 1345, 1986

Palabras clave: oleos essenciais; Aloysia grattisima; leaf

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; E Soler; E Dellacassa

Composition of Aloysia grattisima flower essential oil. Planta Medica, *v.:* 1986, *p.:* 488 - 490, 1986

Palabras clave: oleos essencias; Aloysia grattisima; flores

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Stuttgart ; *ISSN:* 00320943 ; *Idioma/Pais:* Inglés/Alemania


Completo

MOYNA, P.; A Vázquez

Studies in mate drinking. Journal of Ethnopharmacology, *v.:* 18, *p.:* 267 - 272, 1986

Palabras clave: mate; Ilex paraguariensis; cafeina

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Dublin ; *ISSN:* 03788741 ; *Idioma/Pais:* Inglés/Irlanda


Completo

MOYNA, P.; F Ferreira; J Martínez

Metodos simples para determinacion de contaminantes ambientales. Toxicología, *v.:* 1, *p.:* 85 - 88, 1986

Palabras clave: GC; lipidos; AA; metales pesados; contaminates ambientales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / metodos analiticos

Medio de divulgación: Papel ; *Lugar de publicación:* Montevideo ; *ISSN:* 88888888 ; *Idioma/Pais:* Español/Uruguay

Toxicología (Montevideo)1, 85 (1986).

Completo

MOYNA, P.; E Laborde

Seed epicuticular wax of Avena sativa. Phytochemistry, *v.:* 24, *p.:* 179 - 180, 1985

Palabras clave: epicuticular waxes; sementes; Avena; Poaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras vegetales

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; H.Heinzen; A Grompone

Gas chromatographic determination of fatty acid copmpositions. Journal of Chemical Education, *v.:* 62, *p.:* 449 - 450, 1985

Palabras clave: GLC; acidos grasos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / acidos grasos

Medio de divulgación: Papel ; *Lugar de publicación:* Washington ; *ISSN:* 00219584 ; *Idioma/Pais:* Inglés/Estados Unidos


Completo

MOYNA, P.; M Bigo de Grosso

Composicion quimica de las esencias de Mentha del Uruguay. Anales de la Real Academia de Farmacia, *v.:* 51, *p.:* 333 - 338, 1985

Palabras clave: oleos essencias; Mentha; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales

Medio de divulgación: Papel ; *Lugar de publicación:* Madrid ; *ISSN:* 00340618 ; *Idioma/Pais:* Español/España

Completo

MOYNA, P.; H.Heinzen

Epicuticular wax compositions of stems and leaves of Discaria longispina. Anais da Academia Brasileira de Ciências, *v.:* 57, *p.:* 301 - 303, 1985

Palabras clave: Discaria longispina; epicuticular waxes

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* Rio de Janeiro ; *ISSN:* 00013765 ; *Idioma/Pais:* Inglés/Brasil

Completo

MOYNA, P.; JL Di Fabio

Seed polysaccharides in Chamaerops humilis and Washingtonia robusta. Anais da Academia Brasileira de Ciências, *v.:* 56, *p.:* 261 - 263, 1984

Palabras clave: polisacarideos; mananos; sementes; Chamaerops humilis; Washingtonia robusta

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Rio de Janeiro ; *ISSN:* 00013765 ; *Idioma/Pais:* Español/Brasil

Completo

MOYNA, P.; H.Heinzen; E Laborde; G Ramos

Epicuticular wax of Colletia paradoxa. Phytochemistry, *v.:* 22, *p.:* 1283 - 1285, 1983

Palabras clave: epicuticular waxes; Colletia paradoxa; Rhamnaceae; triterpenes

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra

Completo

MOYNA, P.; MA Grompone

Characteristics of uruguayan beef tallow. Journal of the American Oil Chemists Society (JAOCS), *v.:* 60, *p.:* 1331 - 1332, 1983

Palabras clave: lipidos; grasas vacunas; GC

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / grasas

Medio de divulgación: Papel ; *Lugar de publicación:* Washington ; *ISSN:* 0003021X ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; E Soler; H Acosta

Seed wax composition of Arundo donax. Journal of Natural Products, *v.:* 46, *p.:* 606 - 608, 1983

Palabras clave: epicuticular waxes; sementes; Arundo donax; Poaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* Missouri ; *ISSN:* 01633864 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; A Bologna

Determinacion de formaldehido residual en vacunas por GC. Acta Farm. Bonaerense, *v.:* 2, *p.:* 83 - 85, 1983

Palabras clave: GC; formaldehido; vacunas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis cromatografico

Medio de divulgación: Papel ; *Lugar de publicación:* Buenos Aires ; *ISSN:* 03262383 ; *Idioma/Pais:* Español/Argentina

Completo

MOYNA, P.; M Garcia

Oat seed wax composition. . Journal of the Science of Food and Agriculture, *v.:* 34, *p.:* 209 - 211, 1983

Palabras clave: Avena; seeds; ceras epicuticulares

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00225142 ; *Idioma/Pais:* Inglés/Inglaterra

Completo

MOYNA, P.; JL Di Fabio; GGS Dutton

The structure of Chorisia speciosa Gum. Carbohydrate Research, *v.:* 99, *p.:* 41 - 50, 1982

Palabras clave: polisacarideos; Gomas; Chorisia speciosa; Bombacaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Amsterdam ; *ISSN:* 00086215 ; *Idioma/Pais:* Inglés/Holanda

Completo

MOYNA, P.; J Hughes; G Ramos

Main components in Cereus peruvianus epicuticular wax. Journal of Natural Products, *v.:* 43, *p.:* 564 - 566, 1980

Palabras clave: epicuticular waxes; Cereus peruvianus; Cactaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* Missouri ; *ISSN:* 01633864 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; H Casal

Components of Ginkgo biloba leaf wax. Phytochemistry, *v.:* 18, *p.:* 1738 - 1739, 1979

Palabras clave: ceras epicuticulares; folhas; Ginkgo biloba

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra

Completo

MOYNA, P.; HC Jarrell; TF Conway; ICP Smith

Manifestation of anomeric structure in the C-13 NMR spectra of oligomers and polimers containing fructose. Carbohydrate Research, *v.:* 76, *p.:* 45 - 57, 1979

Palabras clave: C-13 NMR; fructose derivatives; inulin

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Amsterdam ; *ISSN:* 00086215 ; *Idioma/Pais:* Inglés/Canadá


Completo

MOYNA, P.; M Castiglioni; R Tubio

Alcaloides del Claviceps paspali obtenido del Paspalum dilatatum. Veterinaria (Montevideo), *v.:* 71, *p.:* 133 - 135, 1979

Palabras clave: alcaloides; Claviceps; Paspalum notatum

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Montevideo ; *ISSN:* 03764362 ; *Idioma/Pais:* Español/Uruguay

Completo

MOYNA, P.; G Ramos; J Toth

Epicuticular wax of Cortaderia selloana seeds. Phytochemistry, *v.:* 17, *p.:* 556 - 557, 1978

Palabras clave: epicuticular wax; seeds; Cortaderia selloana; Poaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; E Soler; G Ramos

Epicuticular wax from Polypogon chilense seeds. Lloydia, *v.:* 41, *p.:* 71 - 72, 1978

Palabras clave: ceras epicuticulares; Polypogon chilense; Poaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / ceras epicuticulares

Medio de divulgación: Papel ; *Lugar de publicación:* MNissouri ; *ISSN:* 00245461 ; *Idioma/Pais:* Inglés/Estados Unidos

Completo

MOYNA, P.; JL Di Fabio

Composition of cactaceae mucilages. Planta Medica, *v.:* 34, *p.:* 207 - 210, 1978

Palabras clave: polisacarideos; mucilagos; Cactaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Stuttgart ; *ISSN:* 00320943 ; *Idioma/Pais:* Inglés/Alemania


Completo

MOYNA, P.; M Podesta; JL Tortora; PR Izaguirre; B Arrillaga; J Altamirano

Seneciosis en bovinos. Veterinaria (Montevideo), *v.:* 1977, *p.:* 97 - 112, 1977

Palabras clave: alcaloides senecio; Seneciosis; bovinos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Montevideo ; *ISSN:* 03764362 ; *Idioma/Pais:* Español/Uruguay

Completo

MOYNA, P.

Mannans from the seeds of Howeia fosteriana. Anais da Academia Brasileira de Ciências, *v.:* 49, *p.:* 235 - 236, 1977

Palabras clave: polisacarideos; mananos; Palmae; Howeia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Rio de Janeiro ; *ISSN:* 00013765 ; *Idioma/Pais:* Español/Brasil



Completo

MOYNA, P.; JL Di Fabio

Mananos en semillas de Phoenix canariensis y Ph. paludosa. Revista latinoamericana de quimica, *v.:* 8, *p.:* 129 - 132, 1977

Palabras clave: polisacarides; mananos; Palmae; Phoenix

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Mexico ; *ISSN:* 03705943 ; *Idioma/Pais:* Español/México

Completo

MOYNA, P.; H Casal; J Altamirano

C-13 NMR spectra of retrorsine. Gazzetta Chimica Italiana, *v.:* 107, *p.:* 361 - 362, 1977

Palabras clave: alcaloides pirrolizidinicos; retrorsina; C-13 NMR

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Roma ; *ISSN:* 00165603 ; *Idioma/Pais:* Inglés/Italia

Completo

MOYNA, P.; R Tubío

Mucilages in succulent plants. Planta Medica, *v.:* 32, *p.:* 201 - 205, 1977

Palabras clave: polisacarideos; mucilagos; plantas suculentas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Stuttgart ; *ISSN:* 00320943 ; *Idioma/Pais:* Inglés/Alemania


Completo

MOYNA, P.; Jose Luis DiFabio; Edgardo Laborde

Alcaloides simples en Cactaceaes del genero Opuntia. Tribuna Farmaceutica, *v.:* 45-46, *p.:* 714 - 12, 1977

Palabras clave: alcaloides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *ISSN:* 03716619 ; *Idioma/Pais:* Español/Brasil

Completo

MOYNA, P.; LMK Saag; GR Sanderson; G Ramos

Cactaceae mucilage composition. Journal of the Science of Food and Agriculture, *v.:* 26, *p.:* 993 - 1000, 1975

Palabras clave: polisacarideos; mucilagos; Cactaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00225142 ; *Idioma/Pais:* Inglés/Inglaterra


Completo

MOYNA, P.; A Adó

analisis cromatografico del aceite extraido de piel y aletas del Dorado (Salminus maxillosus). revista del instituto de investigaciones pesqueras, 1974

Palabras clave: aceite; TLC; Salminus maxillosus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / grasas animales

Medio de divulgación: Papel ; *ISSN:* 16883160 ; *Idioma/Pais:* Español/Uruguay

Completo

MOYNA, P.; JB Harborne; CA Williams; J Greenham

Distribution of charged flavones and caffeylshikimic acid in Palmae. Phytochemistry, *v.:* 13, *p.:* 1557 - 1559, 1974

Palabras clave: charged flavones; flowers; Palmae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / flavonoides

Medio de divulgación: Papel ; *Lugar de publicación:* London ; *ISSN:* 00319422 ; *Idioma/Pais:* Inglés/Inglaterra

Completo

MOYNA, P.; CG Frazer; HJ Jennings

Structural analysis of an acidic polysaccharide from Tremella mesenterica . Canadian Journal of Biochemistry, *v.:* 51, *p.:* 219 - 224, 1973

Palabras clave: polisacarídeos; Tremella mesenterica; structural analysis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Ottawa ; *ISSN:* 00084018 ; *Idioma/Pais:* Inglés/Canadá

Completo

MOYNA, P.; CG Frazer; HJ Jennings

Structural features inhibiting the cross-reaction of the acidic polysaccharide from Tremella mesenterica with a Type II anti-pneumococcal serum. Canadian Journal of Biochemistry, *v.:* 51, *p.:* 225 - 230, 1973

Palabras clave: polisacarídeos; Tremella mesenterica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos

Medio de divulgación: Papel ; *Lugar de publicación:* Ottawa ; *ISSN:* 00084018 ; *Idioma/Pais:* Inglés/Canadá

Completo

MOYNA, P.; Graciela Galante

Azúcares en frutos de Palmae. Phyton - International Journal of Experimental Botany BA Argentina, *v.:* 29, *p.:* 19 - 23, 1972

Palabras clave: azucares libres; frutos; Palmae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel ; *Lugar de publicación:* Vicente Lopez ; *ISSN:* 00319457 ; *Idioma/Pais:* Español/Argentina

Completo

MOYNA, P.; Graciela Galante

Azúcares en flores de Palmae. Phyton - International Journal of Experimental Botany BA Argentina, *v.:* 28, *p.:* 145 - 148, 1971

Palabras clave: azúcares libres; flores; Palmae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel ; *Lugar de publicación:* Vicente Lopez ; *ISSN:* 00319457 ; *Idioma/Pais:* Español/Argentina

Completo

MOYNA, P.; JX DeVries; Víctor Díaz; Jan Bruhn; Stig Agurell

Alcaloides de cactos del Uruguay. Revista latinoamericana de quimica, *v.:* 2, *p.:* 21 - 23, 1970

Palabras clave: alcaloides; Cactaceae; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel ; *Lugar de publicación:* México ; *ISSN:* 03705943 ; *Idioma/Pais:* Español/México

Completo

MOYNA, P.; Rafael Piriz

Dosage of lanoline in non-ionic detergent mixtures. Kemio internacia, 1968

Palabras clave: TLC; non-ionic detergents; lanoline

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis detergentes

Medio de divulgación: Papel ; *ISSN:* 00229857 ; *Idioma/Pais:* Otros/Uruguay

No Arbitrados

Completo

MOYNA, P.; Ana Cristina; Marcelo; Marcia; Paula Luciana; Luciana; Rosangela

Essential oil yield and composition of Lamiaceae Species growing in Southern Brazil. Brazilian Archives of Biology and Technology, *v.:* 52, *p.:* 473 - 478, 2009

Palabras clave: aceites esenciales Lamiaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Papel ; *Lugar de publicación:* Curitiba ; *ISSN:* 03650979

Completo

MOYNA, P.

L´eredita chimica del Prof. G.B. Marini Bettolo in Uruguay. Scritti e Documenti Academia Nazionale dei XL, *p.:* 103 - 105, 1998

Palabras clave: historia quimica Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / Historia

Medio de divulgación: Papel ; *Lugar de publicación:* Roma ; *ISSN:* 03914666 ; *Idioma/Pais:* Italiano/Italia

Completo

MOYNA, P.; C Fernandez; E Manta

Screening de alcaloides IV. Tribuna Farmaceutica, *v.:* 49-50, *p.:* 99 - 102, 1981

Palabras clave: alcaloides; screening

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Curitiba ; *ISSN:* 03716619 ; *Idioma/Pais:* Español/Brasil

Completo

MOYNA, P.; C Morato

Screening de alcaloides III. Tribuna Farmaceutica, *v.:* 48, *p.:* 147 - 150, 1980

Palabras clave: alcaloides; screening

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Curitiba ; *ISSN:* 03716619 ; *Idioma/Pais:* Español/Brasil

Completo

MOYNA, P.; A Bianchi Saus

Dosificacion de acido propil acetico en Plasma. Anales de La Facultad de Química de Montevideo, *v.:* 9, *p.:* 85 - 88, 1979

Palabras clave: GC; acido valproico; plasma sanguineo

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis cromatografico

Medio de divulgación: Papel ; *Lugar de publicación:* Montevideo ; *ISSN:* 07971400 ; *Idioma/Pais:* Español/Uruguay

Completo

MOYNA, P.; R Tubio

Screening de alcaloides II. Tribuna Farmaceutica, *v.:* 45-46, *p.:* 218 - 221, 1977

Palabras clave: alcaloides; screening

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Curitiba ; *ISSN:* 03716619 ; *Idioma/Pais:* Español/Brasil

Completo

MOYNA, P.; MC Borthagaray

Screening de alcaloides. Tribuna Farmaceutica, *v.:* 43 1-2, *p.:* 56 - 68, 1975

Palabras clave: alcaloides; screening

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides

Medio de divulgación: Papel ; *Lugar de publicación:* Curitiba ; *ISSN:* 03716619 ; *Idioma/Pais:* Español/Brasil

Completo

MOYNA, P.

Chemotaxonomy of Cactaceae. Cactaceae Succulent Journal Great Britain, *v.:* 37, *p.:* 39 - 40, 1975

Palabras clave: Quimiotaxonomia Cactaceae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimiotaxonomia

Medio de divulgación: Papel ; *ISSN:* 02643405 ; *Idioma/Pais:* Inglés/Inglaterra

Completo

MOYNA, P.; ML de Martine; A Cazzadori; C Michelotti; HG Wirth

Recuperación de hesperidina de subproductos de jugos cítricos. Revista de Ingeniería, 1971

Palabras clave: citrus; hesperidina

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel ; *ISSN:* 07970560 ; *Idioma/Pais:* Español/Uruguay

Artículos aceptados

Libros

Libro publicado , Texto integral

Blanca Arrillaga de Maffei; MOYNA, P.

Plantas Toxicas. 1975. *Número de volúmenes:* 1, *Nro. de páginas:* 108, *Edicion:* 1,

Editorial: Universidad de la República , Montevideo

Palabras clave: Plantas toxicas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica productos naturales

Medio de divulgación: Papel;

Capitulos de Libro

Capítulo de libro publicado

MOYNA, P.; Fernando

Plantas Medicinales de Uruguay , 2008

Libro: Plantas Medicinales Iberoamericanas. *v.:* 1, *p.:* 100 - 120,

Organizadores: M.P. Gupta

Editorial: Andres Bello , Bogota

Palabras clave: plantas medicinales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Papel;

Financiación/Cooperación: Sin financiamiento / Cooperación

Capítulo de libro publicado
MOYNA, P.
Antecedentes Generales , 2005
Libro: Aportes para el Desarrollo del Sectoir Plantas Medicinales y Aromaticas en el Uruguay. Uruguay
Editorial: Artes Graficas , Montevideo
Palabras clave: productos naturales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Español/Uruguay;

Capítulo de libro publicado
MOYNA, P.; Eduardo; Pilar
Tecnicas Analiticas en Aceites Esenciales , 2002
Libro: Biotecnologia na Agricultura e Agroindustria. *v.:* 2, *p.:* 101 - 145, Brasil
Organizadores: Atti Serafini, Monteiro de Barros, Lucio de Acevedo
Editorial: EDUCS , Caxias do Sul

Palabras clave: aceites esenciales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Analítica / fitoquimica
Medio de divulgación: Papel; *ISSN/ISBN:* 8570611886; *Idioma/Pais:* Portugués/Brasil;
Financiación/Cooperación: Sin financiamiento / Otra

Capítulo de libro publicado
MOYNA, P.; Pilar
Biotransformaciones. , 2001
Libro: Biotecnologia na Agricultura e Agroindustria. *v.:* 1, *p.:* 201 - 226, Brasil
Organizadores: Atti Serafini, Monteiro de Barros, Lucio de Acevedo
Editorial: Editora Agropecuaria , Guaiba
Palabras clave: biotransformaciones
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / biotransformaciones
Medio de divulgación: Papel; *Idioma/Pais:* Portugués/Brasil;
Financiación/Cooperación: Sin financiamiento / Otra

Capítulo de libro publicado
MOYNA, P.; F Ferreira
Alcaloides esteroidales , 1999
Libro: Farmacognosia. Da Planta ao Medicamento. v.: 1 , 1, p.: 707 - 721, Brasil
Organizadores: C.M. Oliveira Simões, E.P.Schenkel, J.C.
Editorial: Eds. UFRGS e UFSC , Porto Alegre
Palabras clave: Alcaloides esteroidales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / alcaloides esteroidales
Medio de divulgación: Papel; ISSN/ISBN: 85702547; Idioma/Pais: Español/Brasil;
Financiación/Cooperación: Sin financiamiento / Otra

Capítulo de libro publicado
MOYNA, P.; H.Heinzen
Lipidos: Química y Productos Naturales que los contienen , 1999
Libro: Farmacognosia. Da Planta ao Medicamento.. v.: 1 , 1, p.: 355 - 386, Brasil
Organizadores: . C.M. Oliveira Simões, E.P. Schenkel, J
Editorial: Editora da Universidade UFRGS y UFSC , Porto Alegre
Palabras clave: lipidos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / lipidos analisis
Medio de divulgación: Papel; ISSN/ISBN: 85702547; Idioma/Pais: Español/Brasil;
Financiación/Cooperación: Sin financiamiento / Otra

Capítulo de libro publicado

MOYNA, P.; Fernando

Plantas Medicinales de Uruguay , 1995

Libro: 270 Plantas Medicinales Iberoamericanas. *v.:* 1 , 1, *p.:* 120 - 140, Colombia

Organizadores: M.P. Gupta

Editorial: SECAB-CYTED , Bogotá

Palabras clave: plantas medicinales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / plantas medicinales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Colombia;

Financiación/Cooperación: Sin financiamiento / Otra

Capítulo de libro publicado

MOYNA, P.

El Debate tras la Fachada , 1994

v.: 1 , 1, *p.:* 30 - 34, Uruguay

Editorial: Editorial Fin De Siglo , Montevideo

Palabras clave: Politica academica

Areas del conocimiento: Ciencias Sociales / Ciencias de la Educación / Educación General

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Financiación/Cooperación: Sin financiamiento / Otra

Capítulo de libro publicado

MOYNA, P.

Metodos analiticos , 1981

Libro: Nuevos Aportes al Estudio y Tratamiento de las Epilepsias. *v.:* 1 , 1, *p.:* 25 - 50, Uruguay

Organizadores: A.Bianchi Saus

Editorial: Editorial Médica , Montevideo

Palabras clave: analisis; farmacocinética

Areas del conocimiento: Ciencias Médicas y de la Salud / Biotecnología de la Salud / Biotecnología relacionada con la Salud

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Financiación/Cooperación: Sin financiamiento / Otra

Trabajos en eventos

Completo

MOYNA, P.

Avaliacao quimica mensal de tres exemplares de Schinus terebinthifolius , 2007

Evento: Internacional , Revista brasileira de Biociencias , Porto Alegre

Anales/Proceedings: Suplemento 2 , 5 , 1011 , 1013

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Portugués/Brasil;

Financiación/Cooperación: Comisión Sectorial de Investigación Científica - UDeLaR / Otra

Completo

MOYNA, P.

Cacacterizacao quimica de populacoes de Schinus molle do Rio Grande do sul , 2007

Evento: Regional , Revista brasileira de biociencias , Porto Alegre , 2006

Anales/Proceedings: Revista Brasileira de Biociencias , 5 , 1014 , 1016

Editorial: Revista brasileira de biociencias , Porto Alegre, BR

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Portugués/Brasil;

Financiación/Cooperación: Comisión Sectorial de Investigación Científica - UDeLaR / Otra

Completo

MOYNA, P.

Liquidos Ionicos en el Estudio de Maduracion de Frutas por RNM , 2006

Evento: Internacional , Alfa/EMERTEC , Dublin, Barcelona , 2006

Anales/Proceedings: Nuevas Tecnologias al Servicio de la Industria Alimentaria , 33 , 36

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / uso liquidos ionicos

Medio de divulgación: Papel; *Idioma/Pais:* Español/Perú;

Resumen

MOYNA, P.

Use of ILs for the processing and analysis of lignocellulosic materials , 2006

Evento: Internacional , 231 ACS National Meeting , Atlanta , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; Idioma/Pais: Inglés/Estados Unidos;

Resumen

MOYNA, P.

Influencia de las condiciones de reaccion de la glicosilacion de lactoglobulina , 2006

Evento: Internacional , XIV Seminario Latinoamericano y del Caribe de Ciencia y Tecnologia de Alimentos , La Habana , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicosilacion proteinas

Medio de divulgación: Otros; *Idioma/Pais:* Español/Cuba;

Resumen

MOYNA, P.

Efecto de glucosa y lactosa sobre las propiedades fisicoquimicas y funcionales de lactoglobulina , 2006

Evento: Internacional , Congreso Internacional de Ciencia y Tecnologia de Alimentos , Cordoba , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicosilacion proteinas

Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.

Caracterizacao de populacoes de Schinus no RGS , 2006

Evento: Regional , 13 encontro estadual de Botanicos , Gramado , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Avaliacao quimica de Schinus terebinthifolius , 2006

Evento: Regional , 13 encontro estadual de Botanicos , Gramado , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Caracterizacao quimica de populacoes de Schinus no RGS , 2006

Evento: Regional , 14 SBQ-Sul , Erechim , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Estudo da composicao quimica das ceras de Palmae , 2006

Evento: Regional , 14 SBQ-Sul , Erechim , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Isolamento e identificacao de metabolitos secundarios das ceras de diferentes Palmae , 2006

Evento: Internacional , 29 reunion anual da SBQ , Aguas de Lindoia , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Use of ionic liquids for the processing and analysis of biomass. Green solvents gone bananas. , 2006

Evento: Internacional , 231 ACS National Meeting , Washington , 2006

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / uso liquidos ionicos

Medio de divulgación: Otros; *Idioma/Pais:* Inglés/Estados Unidos;

Resumen

MOYNA, P.

Use of ionic liquids as alternative NMR solvents for natural polimeric materials , 2005

Evento: Internacional , GCI-ACS , Washington , 2005

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / uso liquidos ionicos

Medio de divulgación: Otros; Idioma/Pais: Inglés/Estados Unidos;

Resumen

MOYNA, P.

Effect of glycosilation on functional properties of lactoglobulin , 2005

Evento: Internacional , 4 Mercosur Congress on Process systems Engineering , Rio de Janeiro , 2005

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicosilacion proteinas

Medio de divulgación: Otros; *Idioma/Pais:* Inglés/Brasil;

Resumen
MOYNA, P.
Identificacao de Butia e syagrus usando marcadores quimiotaxonomicos , 2005
Evento: Internacional , V Reunion Sociedad Latinoamericanas de Fitoquimica , Montevideo , 2005
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Uruguay;

Resumen
MOYNA, P.
Identificacao de Butia e syagrus usando marcadores quimiotaxonomicos , 2005
Evento: Regional , XIII SBQ Sul , Florianopolis , 2005
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen
MOYNA, P.
Metabolitos Secundarios como marcadores quimiotaxonomicos , 2005

Evento: Regional , 28 Reunion anual SBQ , Pocos de Caldas , 2005
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Britsh Indian Ocean;

Resumen
MOYNA, P.
sintesis y actividad biologica de potenciales antiparasitarios por reacciones de Diels Alder , 2005
Evento: Regional , XV SAIQO , Mar del Plata , 2005
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / sintesis
Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen
MOYNA, P.
Variacao de concentracao de compostos nas ceras epicuticulares de Butia capitata durante o envelhecimento , 2004
Evento: Regional , XII Encontro de Quimica na Regiao Sul , Guarupava , 2004
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen
MOYNA, P.
Avaliacao da fracao de hidrocarbonetos de ceras de Butia e Syagrus , 2004
Evento: Nacional , 27 Reunion SBQ , Bahia , 2004
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen
MOYNA, P.
Variacao de concentracao de compostos nas ceras epicuticulares de Butia capitata durante o envelhecimento , 2004
Evento: Nacional , 27 Reunion SBQ , Bahia , 2004
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Efecto de la glicosilacion de la lacgtoglobulina en las propiedades espumantes , 2004

Evento: Internacional , XIII Seminario Latinoamericano y del Caribe de ciencia y Tecnologia de Alimentos , Montevideo , 2004

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / glicosilacion proteinas

Medio de divulgación: Otros; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

Caracterizacion varietal de grappas en Uruguay , 2004

Evento: Internacional , XIII Seminario Latinoamericano y del Caribe de ciencia y Tecnologia de Alimentos , Montevideo , 2004

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

Contribution of some aromatic compounds to the primary aroma of three grappas , 2004

Evento: Internacional , V Brazilian Meeting of Food and Beverages , Sao Carlos , 2004

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.

Breve historia de la fitoquimica en america Latina , 2002

Evento: Internacional , I Congreso Latinoamericano de fitoquimica , Buenos Aires , 2002

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / historia productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.

Presencia de glicoalcaloides en floema de Solanum , 2002

Evento: Internacional , I Congreso Latinoamericano de fitoquimica , buenos Aires , 2002

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.

Essential oils from two populations of Ilex paraguariensis , 2002

Evento: Internacional , I Congreso Latinoamericano de fitoquimica , Buenos Aires , 2002

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Inglés/Argentina;

Resumen

MOYNA, P.

Identificacao e quantificacao de acido cafeico en extratos de plantas nativas do RGS , 2002

Evento: Regional , 16 Congresso Brasileiro de Cosemtologia , Sao Paulo , 2002

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Synthesis, biological action of a series of simple potential antimalarial drugs , 2001

Evento: Internacional , Pharmaceutical Congress of the Americas , Miami , 2001

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / sintesis

Medio de divulgación: Otros; *Idioma/Pais:* Inglés/Estados Unidos;

Resumen

MOYNA, P.

Biotransformacoes de quinoleinicos para obtencao de novos antimalaricos , 2001

Evento: Local , IX Encontro de jovens pesquisadores , Caxias do Sul , 2001

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Marcadores moleculares em Palmeiras , 2001

Evento: Local , IV Simposio de Ciencia y Tecnologia UCS , Caxias do Sul , 2001

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / estudis genomicos

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Incubadora e transferencia de tecnologia em produtos naturais , 2001

Evento: Local , IV Simposio de Ciencia y Tecnologia UCS , Caxias do Sul , 2001

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / industrializacion productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Composicao quimica de hidrocarbonetos na cera de Butia e Syagrus , 2001

Evento: Local , IV Simposio de Ciencia y Tecnologia UCS , Caxias do Sul , 2001

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Determinacao de parametros fisico quimicos de oleos essencias , 2001

Evento: Local , iV Simposio de Ciencia y Tecnologia UCS , Caxias do Sul , 2001

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Bioflavonoid extraction from Citrus deliciosa peels. , 2001

Evento: Nacional , 4th Brazilian Meeting on supercritical fluids , Salvador , 2001

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Aductos de Diels Alder con potencial actividad antiparasitaria , 2001

Evento: Regional , XIII SINAQO , Cordoba , 2001

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / sintesis

Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.

Composicion quimica de la esencia de menta Italo Mitcham cultivada en el Sur de Brasil y Uruguay , 2000

Evento: Internacional , I Simposio latinoamericano de plantas medicinales, aromaticas y condimentos. , Sao Pedro , 2000

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Activity of new sugaresters against caterpillar Anticarsia gemattalis , 2000

Evento: Internacional , 22 IUPAC International Symposium on Chemistry of Natural Products , Sao Carlos , 2000

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.

Composicao do Oleo essencial de Mentha piperita cultivada no Sul de Brasil e Uruguay , 2000

Evento: Nacional , XVI Simposio de Plantas Medicinais do Brasil , Recife , 2000

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.

Composicao do Oleo essencial de Mentha piperita cultivada no Sul de Brasil e Uruguay , 2000

Evento: Internacional , 1 Simposio Latinoamericano de producao de plantas medicinais, aromaticas e condimentares , Botucatu , 2000

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.; H.Heinzen; S Larramendi; C Barra

Influência das ceras epicuticulares de sementes de diferentes cultivares de Girassol (Helianthus annuus L.) no crescimento de Aspergillus flavus e na biossíntese de aflatoxina , 1999

Evento: Local , III Simpósio de Ciência e Tecnologia , Caxias do Sul , 1999

Palabras clave: cera vegetal; Helianthus annus; antifungicas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.; H.Heinzen; S Larramendi; C Barra

Antifungic compounds in sunflower seed waxes , 1999

Evento: Internacional , 2nd. IUPAC International Conference on Biodiversity , Belo Horizonte , 1999

Palabras clave: ceras vegetales; Helianthus annus; antifungicas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.; Di Bella

Pesticide residues in citrus derivatives. Evaluation of the incidence of harvesting and post-harvesting treatments on lemon essential oil and concentrated juice. , 1999

Evento: Internacional , IIIa Reunião da Sociedade Latino-Americana de Fitoquímica. , Gramado , 1999

Palabras clave: citrus; oleos essencias; pesticidas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.

Ricinine from the cuticular wax of Ricinus communis. L. fruits , 1999

Evento: Internacional , IIIa Reunião da Sociedade Latino-Americana de Fitoquímica. , Gramado , 1999

Palabras clave: ceras vegetales; Ricinus communis; ricinine

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.; C D; A Lloret; J L; PR Izaguirre

Essential oils of Camphor tree (Cinnamomum camphora Nees Eberm.) cultivated in Southern Brasil , 1999

Evento: Internacional , IIIa Reunião da Sociedade Latino-Americana de Fitoquímica. , Gramado , 1999

Palabras clave: oleos essenciais; Cinnamomum camphora

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

S Larramendi; H.Heinzen; MOYNA, P.; J Martínez

Acylsugars from flower trichomes of N.glauca Graham , 1999

Evento: Internacional , IIIa Reunião da Sociedade Latino-Americana de Fitoquímica , Gramado , 1999

Palabras clave: esteres de azucares; trichomas; Nicotiana

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.; S Soulé

Glycosides as mediators in the Plant-Aphid interactions , 1999

Evento: Internacional , IIIa Reunião da Sociedade Latino-Americana de Fitoquímica. , Gramado , 1999

Palabras clave: glicosidos; afidos; ecosystems

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

S Soulé; V Argandoña; C Guntner; A Vázquez; MOYNA, P.

A new Solanum glycoside with repellent activity against the aphid Schizaphis graminum , 1999

Evento: Internacional , IIIa Reunião da Sociedade Latino-Americana de Fitoquímica , Gramado , 1999

Palabras clave: Solanum; afidos; glicosidos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

F Ferrando; H.Heinzen; MOYNA, P.

Antioxidant properties of Natural and Semisynthetic flavonoids , 1999

Evento: Internacional , IIIa Reunião da Sociedade Latino-Americana de Fitoquímica , Gramado , 1999

Palabras clave: flavonoides; antioxidantes

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.

Comparacao de processos de obtencao de oleo de Angelica archangelica , 1999

Evento: Internacional , II Encontro de Extracao supercritica de Produtos Naturais , Rio de janeiro , 1999

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Optimizacao de RAPD para Taxonomia de palmae , 1999

Evento: Nacional , 45 Congresso Nacional de Genetica , Gramado , 1999

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / sintesis

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.

Sintesis del aducto de Diels Alder entre tetrametil purpurogalina y nitrosobenceno , 1999

Evento: Regional , XII SINAQO , 1999

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / sintesis

Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.

Determinacao de carbamato de etila em vinhos , 1999

Evento: Nacional , X Congresso brasileiro de Enologia , Bento Goncalves , 1999

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.; I T Moschen Pistoriello; A C Santos; N Paroul; P Menen

Effect of the harvesting time on the concentration of the 3 major essential oil components of Salvia officinalis in South Brasil , 1998

Evento: Internacional , Encontro Internacional de Plantas Medicinais e Aromaticas Mediterraneas. , Conimbriga , 1998

Palabras clave: oleos essenciais; Salvia officinalis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Portugal;

Resumen

MOYNA, P.; LA Serafini; N Paroul; A C Santos; CD Frizzo

Essential oil from Origanum vulgare from South Brasil and Uruguay , 1998

Evento: Internacional , Encontro de Plantas Aromaticas e Medicinais do Mediterraneo , Conimbriga , 1998

Palabras clave: oleos essenciais; Origanum vulgare; South Brasil; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Portugal;

Resumen

S Larramendi; C Barra; H.Heinzen; MOYNA, P.
Influence of Seed Epicuticular Waxes from different Sunflower Cultivars on Aspergillus flavus Growth and Aflatoxin Biosynthesis , 1998

Evento: Internacional , 13th International Symposium on Plant Lipids. , Sevilla , 1998
Anales/Proceedings: Advances in Plant Lipid Research. Proceedings, 13th International Symposium on Plant Lipids. , 609 , 612

Editorial: Pub. Univ. Sevilla , Sevilla

Palabras clave: cera vegetal; Helianthus annus; antifungicas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *ISSN/ISBN:* 84-472-048; *Idioma/Pais:* Inglés/España;

Resumen

MOYNA, P.

FFA de la cera de semillas de maiz , 1998

Evento: Regional , IX encontro nacional de micotoxinas , Florianopolis , 1998

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Español/Brasil;

Resumen

MOYNA, P.

Analisis por GC multidimensional del aceite esencial de Cymbopogon winterianus , 1998

Evento: Regional , XII congreso nacional de recursos aromaticos y medicinales SAIPA , Cordoba , 1998

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen

A Lloret; G Versini; MOYNA, P.; C García; E Soler; H
Caracterización aromática de variedades de Vitis vinifera y vinos. Influencia de los procesos de vinificación en la tipicidad de las mismas , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza

Palabras clave: Vitis vinifera; vinificacion; composicion aromatica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; D Lorenzo; A Verzera; A Trozzi; L Mondello

Estudio de composición de aceites esenciales cítricos del Uruguay. Citrus clementine , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: oleos essencias; citricos; Uruguay; Citrus clementine

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; A C Santos; C D; L Atti; A Lloret; J L; PR Izaguirre

Aceites esenciales de Baccharis dracunculifolia y B. uncinella del sur de Brasil. , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mondeoza , 1997

Palabras clave: oleos essencias; Baccharis; Brasil

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; A C Santos; C D; L Atti; A Lloret; J L; PR Izaguirre

Aceites esenciales de Achyrocline satureoides del Sur de Brasil y del Uruguay. , 1997

Evento: Internacional , Moyna II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: oleos essencias; Achiroclyne satureioides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; I T Moschen Pistoriello; CD Frizzo; E Dellacassa; A Bianchi Saus

Evaluacion de la Evolución de Componentes Químicos de los Aceites Esenciales de Salvia officinialis , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: oleos essencias; Salvia officinalis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; A C Santos; L Atti; A Lloret; PR Izaguirre

Aceites esenciales de Origanum vulgare del Sur de Brasil y Uruguay , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: oleos essencias; Origanum vulgare; Uruguay; Brasil

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; E Dellacassa; H.Heinzen; P Menéndez; P Rodríguez; F Ferreira

Biotransformaciones de limoneno , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: biotransformaçao; oleos essencias

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; E Dellacassa; D Paz; D Bayce; P Davies

Estudio comparativo de aceites esenciales de Myrciantes cisplantensis y Blepharocalyx tweedii , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: oleos essenciais; Myrciantes cisplatensis; Blepharocalyx tweedii

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

F Ferreira; M; N Suárez; A Vázquez; MOYNA, P.

Effect of Ilex paraguariensis (yerba mate) saponins on cholesterol serum levels of rats , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: Ilex paraguariensis; saponins; serum cholesterol

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; A Vázquez; E Alonso Paz; L Gadola; M Márquez; A Bianchi Saus

Intoxicación por Ruta chalepensis. Estudios fitoquímicos y fisiopatológicos , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: Ruta chalepensis; toxicidad

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; V Cesio; C García; L Ferrando; P Menéndez; H.Heinzen

Relación estructura-actividad antioxidante en flavonoides y su correspondencia con el efecto protector sobre la citotoxicidad inducida por procesos oxido-reductivos en Saccharomices cerevisiae , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: flavonoides; Structure activity relationship; antioxidant; Saccharomyces cerevisae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; S Soulé; F Ferreira; A Vázquez; P Cerdeiras; J Fernández

Estudio de la actividad antimicrobiana de Solanum laxum y S. amygdalifolium , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: Solanum; actividad antimicrobiana

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

C Barra; MV Cesio; H; MOYNA, P.; C García; E Soler

Propiedades antifungicas de ésteres de azúcares de Solanaceas nativas , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: Solanaceae; antifungicas; esteres de azucares

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; C Barra; MV Cesio; L Ferrando; F Ferreira

Propiedades antioxidantes de flavonoides de Solidago chilensis , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: flavonoides; antioxidantes; Solidago

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

F Ferreira; A González; G González; G Meroni; MOYNA, P.; A Pastor; M Cajahuanca

Estudio comparativo y desarrollo de métodos de cuantificación de capsaicinas en Capsicum y productos derivados , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Palabras clave: Capsicum; capsaicina

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.

Variacion de metabolitos secundarios en hojas de Eucalyptus globulus , 1997

Evento: Internacional , II Congreso Mundial WOCMAP , Mendoza , 1997

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; S

Biooxidaciones del d-limoneno , 1996

Evento: Regional , VIII Simposio de Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1996

Palabras clave: limoneno; biooxidaciones

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; Moschen Pistoriello; I Olano; J L; C García; PR Izaguirre

Extracción y Biotransformaciones de Aceites Esenciales de Salvia officinalis. , 1996

Evento: Internacional , VIII Simposio de Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica , Montevideo , 1996

Palabras clave: oleos essenciais; Salvia officinalis; biotransformaciones

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; I Olano; F; A Lloret; L A

Estudio de toxicidad del extracto de Ruta chalepensis en ratas Wistar. , 1996

Evento: Internacional , VIII Simposio de Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1996

Palabras clave: Ruta chalepensis; toxicidad; rata Wistar

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; C García; H.Heinzen; S Larramendi; J Martínez; E Soler; H

Potencial alelopático del medio de germinación de semillas de Ammi majus. , 1996

Evento: Internacional , VIII Simposio Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1996

Palabras clave: Ammi majus; sementes; alelopatia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

S Larramendi; H.Heinzen; MOYNA, P.

Variación del crecimiento de Aspergillus flavus sobre semillas de girasol (Helianthus annus). Influencia de las ceras epicuticulares. , 1996

Evento: Internacional , VIII Simposio Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1996

Palabras clave: sementes; Helianthus annus; ceras vegetales; fungos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

D Lorenzo; G González; S Larramendi; H.Heinzen; MOYNA, P.

Evaluación de la adaptación de cultivares de bergamota (Citrus bergamia) en Uruguay a través de la compsición química y enantiomérica de su aceite esencial. , 1996

Evento: Internacional , VIII Simposio Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1996

Palabras clave: oleos essenciais; enantiomeros; bergamota; citrus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; E Dellacassa; J Peverelli; C García; D Lorenzo; A Lloret

Evaluación de plantas aromáticas potencialmente útiles. Salvia officinalis , 1996

Evento: Internacional , VIII Simposio Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1996

Palabras clave: Salvia officinalis; plantas aromaticas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

V Cesio; H.Heinzen; A González; S Rodríguez; MOYNA, P.

Esteres de azúcares de la cera epicuticular de solanáceas nativas , 1996

Evento: Internacional , VIII Simposio Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica , Montevideo , 1996

Palabras clave: cera vegetal; Solanaceae; esteres de azucares

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

A González; MV Cesio; H.Heinzen; MOYNA, P.

Propuesta de un posible mecanismo de la bioactividad de agliconas triterpénicas: algunas evidencias , 1996

Evento: Internacional , VIII Simposio Latinoamericano de Farmacobotánica y II Reunión de la Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1996

Palabras clave: triterpenos; bioactividad

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; C García; E Soler; H

Situation of the Chemical Industry in Uruguay. Facing the MERCOSUR. , 1996

Evento: Internacional , XI Chemrawn Meeting , Seoul , 1996

Palabras clave: Chemical industry; Mercosur; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica industrial

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Corea del Sur;

Resumen

MOYNA, P.; E Dellacassa; L A; A Lloret

La composición de los aceites esenciales de tres plantas uruguayas. , 1996

Evento: Internacional , V Congreso Italo-Latinoamericano de Etnobotánica , Roma , 1996

Palabras clave: oleos essenciais

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Italia;

Resumen

CD Frizzo; Moschen Pistoriello; N Paroul; S Larramendi; H.Heinzen; MOYNA, P.; I Olano; J L; C García; PR Izaguirre

Aceites esenciales de Rosmarinus officinalis del Sur de Brasil, Argentina y Uruguay , 1996
Evento: Internacional , III Simposio Internacional de Química de Productos Naturales y sus Aplicaciones , Punta de Tralca , 1996

Palabras clave: Rosmarinus officinalis; oleos essenciais
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; P Menéndez; R Rodriguez; G Delle Monache

Biotransformación de d-limoneno por Aspergillus niger , 1996
Evento: Internacional , III Simposio Internacional de Química de Productos Naturales y sus Aplicaciones , Punta de Tralca , 1996

Palabras clave: biotransformaçao; limoneno; Aspergillus niger
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; I T Moschen Pistoriello; CD Frizzo; E Dellacassa

Aceites esenciales de Salvia officinalis del Sur de Brasil , 1996
Evento: Internacional , III Simposio Internacional de Química de Productos Naturales y sus Aplicaciones , Punta de Tralca , 1996

Palabras clave: Salvia officinalis; Brasil
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

G González; F; S Larramendi; H.Heinzen; MOYNA, P.

Alergenos de Lithraea molleoides y L.brasiliensis , 1996
Evento: Internacional , III Simposio Internacional de Química de Productos Naturales y sus Aplicaciones , Punta de Tralca , 1996

Palabras clave: Lithraea; alergenos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; C Barra; S Larramendi; H.Heinzen; J Martínez

Algunos aspectos de la química ecológica de las ceras epicuticulares de semillas , 1996
Evento: Internacional , III Simposio Internacional de Química de Productos Naturales y sus Aplicaciones , . Punta de Tralca

Palabras clave: cera vegetal; quimica ecologica; Helianthus annus
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.

The chemical basis of the resistance of cereal seeds to pathogenic fungi , 1996
Evento: Internacional , IFS Workshop in Techniques in Plant-Insect Interactions and Biopesticides , Stockholm , 1996
Anales/Proceedings: Proceedings of the IFS Workshop in Tcniques in Plant-Insect Interactions and Biopesticides
Palabras clave: cereales; semillas; hongos patogenicos; resistencia quimica
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *ISSN/ISBN:* 91 85798 4; *Idioma/Pais:* Inglés/Suecia;

Resumen
MOYNA, P.
Actividad antimicrobiana de plantas medicinales uruguayas , 1996
Evento: Internacional , II reunion de la Sociedad Latinoamericana de Fitoquimica , Montevideo , 1996
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Español/Uruguay;

Resumen
MOYNA, P.
Evaluacion de cultivares de bergamota por composicion quimica y enantiomerica de aceites esenciales , 1996
Evento: Regional , X Congreso nacional de Recursos Naturales, Aromaticos y Medicinales , La Plata , 1996
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Español/Argentina;

Resumen
MOYNA, P.
Aspectos de la quimica ecologica de las ceras epicuticulares , 1996

Evento: Internacional , III Simposio Internacional de quimica de productos naturales , Puntas de Tralca , 1996
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Español/Chile;

Resumen
MOYNA, P.
Perfil aromatico varietal de vinos uruguayos , 1996
Evento: Internacional , IV Jornadas de Invetigacion del AUGM , Mariluz , 1996
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Español/Brasil;

Resumen
MOYNA, P.
Componentes en la fase acuosa de la extraccion de aceites esenciales , 1996
Evento: Internacional , IV Jornadas de Invetigacion del AUGM , Mariluz , 1996
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Otros; *Idioma/Pais:* Español/Brasil;

Resumen
MOYNA, P.; G; M
Contaminación de aceites esenciales cítricos. Residuos de pesticidas organofosforados en aceites de limón del Uruguay. , 1995

Evento: Nacional , II Congreso Nacional de Química de Alimentos. , Giardini-Naxos , 1995
Palabras clave: oleos essenciais; citrus; pesticidas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Italia;

Resumen
MOYNA, P.; H
Variación del contenido de alquilresorcinoles en Cebada Cervecera. Sus implicaciones en la resistencia a hongos , 1995
Evento: Nacional , VI Reunión de Cebada Cervecera. , Montevideo , 1995
Palabras clave: alquil-resorcinoles; cebada; resistencia hongos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

Aromas de Vinos Uruguayos , 1995

Evento: Internacional , Reunión Mundial del Vino , Punta del Este , 1995

Palabras clave: aromas; vinos; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica analitica

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

Estudio comparativo de metodos de extraccion de volatiles del vino , 1995

Evento: Nacional , 3 jornadas Uruguayas de Ciencia y Tecnologia de alimentos , Montevideo , 1995

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica analitica

Medio de divulgación: Otros; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; H

Bases Químicas de la Resistencia a Hongos Patógenos en Cebadas Producidas en el Uruguay. , 1994

Evento: Nacional , VII Reunión de la Mesa de la Cebada , Colonia , 1994

Palabras clave: ceras; hongos; resistencia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; S

On the Chemical Ecology of triterpene aglycones , 1994

Evento: Internacional , VII International Congress on Pesticide Chemistry. PESTICIDES 2000. IUPAC-ACS Meeting , Washington DC , 1994

Palabras clave: triterpene; chemical ecology

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Estados Unidos;

Resumen

MOYNA, P.; S Rodríguez; H.Heinzen; J Pignataro

Activity of B-diketones in membranes. , 1994

Evento: Internacional , 2nd International Symposium on Macrocyclic Ligands for the Design of New Materials. IUPAC-ELARG. , Buenos Aires , 1994

Palabras clave: membranes; diketones

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Argentina;

Resumen

MOYNA, P.; E

Onion pungency evaluation and its correlation with farming conditions. , 1994

Evento: Internacional , Ier Simposio Internacional sobre Alliáceas Comestibles , Mendoza , 1994

Palabras clave: onion; pungency; chemical composition

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Argentina;

Resumen

MOYNA, P.; D Swedzki; E

Sweet Onion Pungency Evaluation and its Correlation with Farming Conditions. , 1994

Evento: Internacional , III Congreso Italo-Latinoamericano de Etnomedicina , Roma , 1994

Palabras clave: onion; pungency; chemical composition

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Italia;

Resumen

MOYNA, P.; M Saitta; I Stagno D'alcontres; E Dellacassa; C García; D Lorenzo; A Lloret

Determinación de residuos de pesticidas organo-fosforados en los aceites esenciales de Uruguay , 1994

Evento: Internacional , III Congreso Italo-Latinoamericano de Etnomedicina. , Roma , 1994

Palabras clave: pesticidas; oleos essenciais; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica analitica

Medio de divulgación: Papel; *Idioma/Pais:* Español/Italia;

Resumen

MOYNA, P.; E Dellacassa; C García; D Lorenzo; A Lloret

Caracterización de los aceites esenciales de limón de Uruguay , 1994

Evento: Internacional , III Congreso Italo-Latinoamericano de Etnomedicina , Roma , 1994

Palabras clave: oleos essenciais; limon; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Italia;

Resumen

S Rodríguez; H.Heinzen; MOYNA, P.

Estudio de un posible mecanismo de acción biológica de los triterpenos , 1994

Evento: Regional , II Jornadas de Investigación, AUG Montevideo. , Salto , 1994

Palabras clave: triterpenos; accion biologica; membranas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

Aplicación del análisis multivariable a la clasificación varietal de limón en Uruguay. , 1994

Evento: Regional , II Jornadas de Investigación, AUG Montevideo , Salto , 1994

Palabras clave: oleos essenciais; limon; Uruguay; analisis multivariables

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

S Rodríguez; H.Heinzen; HA Garda; R Brenner; MOYNA, P.

Estudio de un posible mecanismo de acción biológica de los triterpenos. , 1994

Evento: Nacional , XXIII Reunión Científica de la SAB. , Villa Giardino , 1994

Palabras clave: triterpenos; accion biologica; membranas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.

Estudio de la variabilidad de Solanum comersonii en el Uruguay. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones. , Concepcion , 1994

Palabras clave: Solanum commersonii; glicoalcaloides; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; A Verzera; A Trozzi; L Mondello; P Dugo; G Dugo

Estudio de la relación enantiomérica de alcoholes monoterpénicos en aceites esenciales cítricos. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones. , Concepcion , 1994

Palabras clave: alcoholes monoterpenicos; oleos essencias; citrus; enantiomeros

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; G

Influencia de diferentes cultivares sobre la composición de aceite esencial de limón cultivado en Uruguay. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones. , Concepcion , 1994

Palabras clave: composicion; oleos essenciais; limon; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; M

Marcadores quimiotaxonómicos de la composición en cultivares cítricos del Uruguay , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones. , Concepcion , 1994

Palabras clave: quimiotaxonomia; citrus; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.

Estudio de la variación química de los aceites esenciales de Baccharis de diferentes orígenes. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones , Concepcion , 1994

Palabras clave: oleos essenciais; Baccharis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.

Determinación estructural de oxo-B-dicetonas en cera epicuticular de cebada. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones. , Concepcion , 1994

Palabras clave: oxo-dicetonas; cebada; ceras

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; S O'Neill

Biotransformación bacteriana de d-limoneno. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones , Concepcion , 1994

Palabras clave: biotransformacion; limoneno

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; S

On the chemical ecology of triterpene glycosides. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones. , Concepcion , 1994

Palabras clave: triterpene glycosides; chemical ecology

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Chile;

Resumen

H.Heinzen; V Cesio; A González; S Rodríguez; MOYNA, P.

Acumulación (29-13C) lupeol en el áfido Macrosiphus euphorbiae. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones. , Concepcion , 1994

Palabras clave: lupeol; afidos; acumulacion

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

R Vaz; A Vázquez; F Ferreira; MOYNA, P.

Estudio de plantas medicinales autóctonas con actividad antiinflamatoria. , 1994

Evento: Regional , II Simpósio Internacional Química de Productos Naturales y sus Aplicaciones. , Concepcion , 1994

Palabras clave: plantas medicinales; antiinflamatorios

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; S Rodriguez; R Eiraldi; M Martínez

Programmes at the Chemistry College of Montevideo, URUGUAY , 1994

Evento: Internacional , IUPAC ELARG2nd International Sympósium , Buenos Aires , 1994

Palabras clave: sumulas; Facultad de Quimica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / Educacion quimica

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Argentina;

Resumen

MOYNA, P.; Horacio

Selective esterification of diols with Candida cyclindraceae lipase , 1994

Evento: Regional , VI BMOS , Sao Paulo , 1994

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / biosintesis

Medio de divulgación: Otros; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.; H.Heinzen

Compuestos de ceras epicuticulares que dan resistencia a hongos en la cebada , 1993

Evento: Nacional , VI Reunión Nacional de Cebada , Palmar , 1993

Palabras clave: ceras; cebada; hongosresistencia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; H.Heinzen; R Perdomo

Metil éteres de triterpenos como marcadores taxonómicos en Palmae , 1993

Evento: Nacional , I Jornadas de Investigación del Grupo Montevideo , Santa María , 1993

Palabras clave: Palmae; triterpenos; metil eteres; quimiotaxonomia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Brasil;

Resumen

D Szwedzki; G Mahler; E Dellacassa; F Vilar; MOYNA, P.

Evaluación de cebollas cultivadas en el Uruguay a partir de la medida química de la pungencia , 1993

Evento: Regional , I Jornadas de Investigación del Grupo Montevideo , Santa María

Palabras clave: cebolhas; pungencia; medidas quimicas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Brasil;

Resumen

MOYNA, P.; Eduardo

Caracterización de los Aceites esenciales de distintas variedades cítricas , 1993

Evento: Regional , I Jornadas de Investigación del Grupo Montevideo , Santa María , 1993

Palabras clave: oleos essenciais; citrus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Brasil;

Resumen

MOYNA, P.; Eduardo

Caracterización de los Aceites esenciales de distintas variedades cítricas Nota I. , 1993

Evento: Nacional , VII Congreso Nacional de Recursos Naturales Aromáticos y Medicinales. SAIPA , .. San Miguel de Tucumán , 1993

Palabras clave: oleos essenciais; citrus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

Rossini C; E Pandolfi; E Dellacassa; MOYNA, P.

Determinación de 1,8-cineol en aceites esenciales de Eucalyptus por densitometría sobre TLC. , 1993

Evento: Nacional , VII Congreso Nacional de Recursos Naturales Aromáticos y Medicinales. SAIPA , San Miguel de Tucumán , 1993

Palabras clave: oleos essenciais; Eucalyptus; 1 8-cineol; densitometria; TLC

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

P Menéndez; S O'Neill; S Mahler; E Dellacassa; MOYNA, P.

Estudio de la actividad antimicrobiana de distintos aceites esenciales. Nota I , 1993
Evento: Nacional , VII Congreso Nacional de Recursos Naturales Aromáticos y Medicinales. SAIPA , San Miguel de Tucumán , 1993

Palabras clave: oleos essenciais; atividade antimicrobiana

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

D Szwedzki; G Mahler; E Dellacassa; MOYNA, P.

Estudio de la composición química y actividad antimicrobiana de aceites esenciales de Baccharis dracunculifolia y B.trimera , 1993

Evento: Internacional , 1er. Congreso de FEFAS y 2'Congreso de Ciencias Farmacéuticas del Cono Sur. , Montevideo , 1993

Palabras clave: oleos essenciais; atividade antimicrobiana; Baccharis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; P Menéndez; S O'Neill; S Mahler; E Dellacassa

Evaluación de cebollas cultivadas en el Uruguay a partir de la medida química de la pungencia. , 1993
Evento: Internacional , 1er. Congreso de FEFAS y 2'Congreso de Ciencias Farmacéuticas del Cono Sur , Montevideo , 1993

Palabras clave: cebolhas; pungencia; Uruguai

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; D Lorenzo; D Martínez; M Chifflet; F Carrau

Caracterización de aceites esenciales en diferentes especies de mandarinas , 1993
Evento: Internacional , 1er. Congreso de FEFAS y 2'Congreso de Ciencias Farmacéuticas del Cono Sur. , Montevideo , 1993

Palabras clave: oleos essenciais; mandarinas; citrus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; dos Reis

Obtención preparativa de glicoalcaloides de Solanum tuberosum por MPLC , 1993
Evento: Internacional , 1er. Congreso de FEFAS y 2'Congreso de Ciencias Farmacéuticas del Cono Sur , Montevideo , 1993

Palabras clave: Solanum tuberosum; glicoalcaloides; MPLC

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

G González; G Galván; F Vilaró; MOYNA, P.; A Vázquez

Variabilidad fitoquímica de Solanum comersonii en el sur de Uruguay , 1993
Evento: Internacional , 1er. Congreso de FEFAS y 2'Congreso de Ciencias Farmacéuticas del Cono Sur , Montevideo , 1993

Palabras clave: Solanum comersonii; variabilidade; Uruguay

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; E Dellacassa; F Ferreira; P Menéndez; Rossini C

Diferencias varietales en los flavonoides de Achyrocline satureioides. , 1993

Evento: Internacional , 1er. Congreso de FEFAS y 2'Congreso de Ciencias Farmacéuticas del Cono Sur , Montevideo , 1993

Palabras clave: Achyrocline gnaphaleoides; flavonoides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

Selective esterification of cis-Cyclohexa-3,5-diene-1,3 diols using Candida cylindraceae Lypase as catalist in organic media. , 1993

Evento: Nacional , VI Brazilian Meeting on Organic Synthesis , Sao Paulo , 1993

Palabras clave: esterification; C cylindraceae; lipase; cyclohexadienediols

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / sintesis biocatalitica

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.

Determinacion de cineol en eucaliptus por densitometria TLC , 1993

Evento: Regional , VII congreso nacional de recursos aromaticos. SAIPA , Tucuman , 1993

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Idioma/Pais: Español/Argentina;

Resumen

MOYNA, P.

Efecto de glicosidos y glicoalcaloides sobre afidos , 1993

Evento: Internacional , I Jornadas de investigacion AUGM , Santa Maria , 1993

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Español/Brasil;

Resumen

MOYNA, P.

Efecto de glicosidos y glicoalcaloides sobre afidos , 1993

Evento: Internacional , Trends in Natural Produc Research , Asuncion , 1993

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Otros; *Idioma/Pais:* Español/Paraguay;

Resumen

MOYNA, P.; G

Evaluación química y agronómica de diferentes cultivares de cebollas. , 1992

Evento: Internacional , I Congreso Iberoamericano, V Latinoamericano y IV Nacional de Horticultura , Montevideo , 1992

Palabras clave: cebolhas; evaluaçao quimica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

V Cesio; G Moyna; M Torres; MOYNA, P.

Simle methods for lactose intolerance detection , 1992

Evento: Internacional , AIEA-CRP on Stable isotopes in Medicine and Nutrition. , Houston , 1992

Palabras clave: lactose intolerance; tlc densitometry; nmr

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica analitica

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Estados Unidos;

Resumen

H.Heinzen; MOYNA, P.

Use of specific site labelling as a tool in Medicine and Nutrition. , 1992

Evento: Internacional , IAEA-CPR use of stable isotopes in medicine and nutrition , Houston , 1992

Palabras clave: stable isotopes; labelling; sites

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / sintesis organica

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Estados Unidos;

Resumen

MOYNA, P.; S García; H.Heinzen

Determinación de las bases químicas de la resistencia a hongos en cultivares de cebada , 1992

Evento: Nacional , III Reunión Nacional de Investigacion de Cebada , Monas , 1992

Palabras clave: metabolitos secundarios; resistencia a fungos; cebada

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

F Ferreira; A González; G González; G Meroni; MOYNA, P.

Effect of the Saponins of Ilex paraguariensis on the Excretion of Bile Acids. , 1992

Evento: Nacional , XII Simpósio de Plantas Medicinais do Brasil , Curitiba , 1992

Palabras clave: Ilex paraguariensis; saponinas; acidos biliares; excreçao

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.; I Bauer; V Cesio; E Dellacassa; F Ferreira; C García

Achyrocline satureioides Chimiotypes , 1992

Evento: Nacional , XII Simpósio de Plantas Medicinais do Brasil , Curitiba , 1992

Palabras clave: Achiroclyne satureioides; quimiotipos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

A González; F Ferreira; A Vázquez; MOYNA, P.; E Alonso Paz

Biological Screening of Uruguayan Medicinal Plants. , 1992

Evento: Nacional , XII Simpósio de Plantas Medicinais do Brasil , Curitiba , 1992

Palabras clave: plantas medicinais; screening biologico; Uruguai

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.; H.Heinzen; S Larramendi; J Martínez

Natural Lypophilic Sequestering Agents , 1992

Evento: Internacional , International Symposium on Macrocyclic Ligands as New materials , Guilford

Palabras clave: sequestering agents; lypophilic; diketones

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Inglaterra;

Resumen

MOYNA, P.; I Bauer; V Cesio; E Dellacassa; F Ferreira; A González

Achyrocline satureioides Chimiotypes II , 1992

Evento: Internacional , First World Congress on Medicinal and Aromatic Plants for Human Welfare , Maastrich

Palabras clave: quimiotipos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Holanda;

Resumen

MOYNA, P.; M; C García; G

Efeito genotoxico do alcaloide berberina en microorganismos. , 1991

Evento: Nacional , VI Reuniao Anual da Federacao de Sociedades de Biologia Experimental , Caxambu , 1991

Palabras clave: genotixicidade; berberina; microbiana

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.; H

Determinación de índices taxonómicos y bases de resistencia a hongos en ceras epicuticulares de trigos uruguayos. , 1991

Evento: Nacional , 2a. Reunión Nacional de Cebada Cervecera , La Estanzuela , 1991

Palabras clave: ceras vegetales; componentes; trigo

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; M; C García; G

Efeito genotoxico do alcaloide isoquinolinico berberina em celulas eucarioticas e procarioticas. , 1991

Evento: Nacional , I Simposio Latinoamericano de Mutagenese, Carcinogenese e teratogenia ambiental , Caxambu , 1991

Palabras clave: genotixicidade; berberina; procariotes; eucariotes

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Portugués/Brasil;

Resumen

LA Serafini; AJP Dillon; ITM Pistoriello; MOYNA, P.

Effect of Quinine Sulfate on Saccharomyces cereviceae , 1991

Evento: Regional , I Congreso de Farmacia del Cono Sur , Gramado , 1991

Palabras clave: quinine; Saccharomyces cerevisae

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Portugués/Brasil;

Resumen

MOYNA, P.; M; CP Lauer; K Saag; K Caless

Avaliacao da atividade genotoxica da berberina em celulas eucarioticas. , 1991

Evento: Regional , I Congreso de Farmacia do Cono Sul. , Gramado , 1991

Palabras clave: berberina; genotoxicidade; eucaryotes

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Portugués/Brasil;

Resumen

A González; H.Heinzen; MOYNA, P.

Wax from Colletia paradoxa on its Ecosystem: Evaluation of the Action of Individual Fractions and the Whole Wax on Wheat Seedlings. . Influence of the Epicuticular , 1991

Evento: Internacional , 3rd. International Environmental Chemistry Congress in Brazil , Salvador , 1991

Palabras clave: ceras vegetales; Rhamnaceae; Colletia paradoxa; ecosystems

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Trabalho Premiado como melhor do Congresso

Resumen

MOYNA, P.; E Dellacassa; H.Heinzen; P Menéndez; F Ferreira

Changes in the Pattern of Secondary Metabolites of Eucalyptus camaldulensis in the Surroundings of a Sulphuric acid industry , 1991

Evento: Internacional , 3rd. International Environmental Chemistry Congress in Brazil , Salvador , 1991

Palabras clave: Eucalyptus camaldulensis; Secondary metabolites

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica analitica

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

R Martínez; E Dellacassa; MOYNA, P.

Simultaneous Determination of o-phenyl phenol, imazalil and thiabendazole residues in citrus by TLC-Densitometry , 1991

Evento: Internacional , 3rd. International Environmental Chemistry Congress in Brazil , Salvador , 1991

Palabras clave: tlc-densitometry; o-phenyl phenol; imazalil; thiabendazole; citrus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica analitica

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Brasil;

Resumen

MOYNA, P.

PEDECIBA, an experiment in science support in Uruguay. Chemistry and Developing countries. , 1991

Evento: Internacional , Royal Society of Chemistry. Annual Meeting , London , 1991

Palabras clave: desenvolvimiento tecnico; investigacion cientifica

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / apoyo ciencias

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Inglaterra;

Resumen

MOYNA, P.; D Davyt

Aplicacion de densitometria de Capa Delgada al estudio de ceras de trigo , 1990

Evento: Internacional , VI FLAQ , Buenos Aires , 1990

Palabras clave: TLC; densitometria; ceras; trigo

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

E Dellacassa; Rossini C; P Menéndez; MOYNA, P.; A Verzera

Composición de los aceites esenciales de mandarinas cultivadas en Uruguay. , 1990

Evento: Nacional , 1 Congreso Nazionale di Chimica degli Alimenti , Messina , 1990

Palabras clave: oleos essenciais; citricos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Italia;

Resumen

E Dellacassa; P Menéndez; MOYNA, P.

Quimiotaxonomía del Género Eucalyptus en el Uruguay. , 1989

Evento: Internacional , VI Asian Symposium on Medicinal Plants and Spices (ASOMPS) , Bandung , 1989

Palabras clave: Eucalyptus; componentes; oleos essenciais

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Indonesia;

Resumen

MOYNA, P.; M

Estudios sobre Intolerancia a la Lactosa utilizando isotopos estables. , 1989

Evento: Internacional , Reunião do grupo de Isotopos estaveis da IAEA , Viena , 1989

Palabras clave: TLC; azucares; intolerancia a lactosa

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis clinicos

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Austria;

Resumen

MOYNA, P.

Estudios de Productos Naturales realizados en Montevideo , 1989

Evento: Nacional , Reunión extraordinaria Dpeto. Química, Univ. San Marcos , La Paz , 1989

Palabras clave: Produtos naturais

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Bolivia;

Resumen

MOYNA, P.

Farmacognosia Americana. , 1988

Evento: Internacional , Congreso Extraordinario. Instituto Boliviano de Biología de Altura , La Paz , 1988

Palabras clave: Farmacognosia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Bolivia;

Resumen

A Vázquez; MOYNA, P.

Estudios sobre yerba mate. , 1987

Evento: Nacional , Simposio CEUTA-Plantas Tóxicas , Montevideo , 1987

Palabras clave: mate

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; M; J Martínez

Aplicación de productos naturales en biotecnología. , 1987

Evento: Internacional , Primera Reunión Sociedad Latinoamericana de Fitoquímica , Montevideo , 1987

Palabras clave: Produtos naturais; biotecnologia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; F

Acción de componentes de ceras epicuticulares sobre estructuras celulares debilitadas , 1987

Evento: Internacional , Primera Reunión Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1987

Palabras clave: ceras vegetales; componentes; accion; celulas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

J Martínez; MOYNA, P.; A Ferreyro; H.Heinzen

Sistemas simples para determinación de contaminantes ambientales. , 1986

Evento: Nacional , I Reunión Sociedad Uruguaya de Toxicología y Ecotoxicología , Montevideo , 1986

Palabras clave: sistemas simples; contaminantes ambientales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica ambiental

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; A Laborde; L Heuhs; A Vázquez

Mate drinking: another source of caffeine , 1986

Evento: Internacional , III World Congress Federation Associations of Clinical Toxicology Centers. , Bruselas , 1986

Palabras clave: cafeina; mate

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Bélgica;

Resumen

A Vázquez; J Pronckzuk; A Laborde; L Heuhs; MOYNA, P.

Ingestión de cafeina en tomadores de mate. , 1986

Evento: Internacional , II Simposio Argentino y V Latinoamericano de Farmacobotánica. , La Plata , 1986

Palabras clave: mate; cafeina; ingesta

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; F Ferreira; A Riva

Sintesis de compuestos con C-13. Sus posibilidades en Uruguay. , 1986

Evento: Internacional , Seminario sobre aplicaciones de isotopos estables en estudios de medicina y nutrición humana , Viena , 1986

Palabras clave: isotopos estables; sintesis

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / sintesis organica

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Austria;

Resumen

H.Heinzen; V Cesio; A González; S Rodríguez; MOYNA, P.

Cera de Espina de la Cruz como excipiente. , 1986

Evento: Internacional , III Reunión Latinoamericana de Ciencias Farmacéuticas. , Montevideo , 1986

Palabras clave: ceras; Rhamnaceae; excipiente

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; Fernando

Análisis de contaminación por lípidos en arenas del Rio de la Plata. , 1986

Evento: Internacional , III Reunión Latinoamericana de Ciencias Farmacéuticas. , Montevideo , 1986

Palabras clave: lipidos; contaminantes; Rio de la Plata

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica ambiental

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

L A; A Lloret; J Martínez; G Versini; MOYNA, P.; C García; E Soler; H

Aplicación de productos naturales en biotecnología II. , 1986

Evento: Internacional , Primera Reunión Sociedad Latinoamericana de Fitoquímica. , Montevideo , 1986

Palabras clave: biotecnologia; Produtos naturais

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; Antonia

Isomerización cis-trans de sustancias grasas catalizadas con niquel , 1985

Evento: Internacional , XI Congreso Internacional de Ingeniería Química , San Juan , 1985

Palabras clave: isomerizacion cis trans; catalizador de niquel; grasas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / grasas y aceites

Medio de divulgación: Papel; *Idioma/Pais:* Español/Puerto Rico;

Resumen

MOYNA, P.; M

Isomerización cis-trans de sustancias grasas con un catalizador de niquel. , 1984

Evento: Internacional , XVI Congreso Latinoamericano de Química. , Rio de Janeiro , 1984

Palabras clave: isomerizacion cis trans; grasas; catalizador de niquel

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / grasas y aceites

Medio de divulgación: Papel; *Idioma/Pais:* Español/Brasil;

Resumen

MOYNA, P.; H.Heinzen; E Soler

A laborious road to University-Industry links , 1984

Evento: Internacional , IIEC UNESCO Meeting , Ljubljana , 1984

Palabras clave: transferencia tecnologica; desenvolvimiento tecnico

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / estudios de la ciencia

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Yugoslavia;

Resumen
MOYNA, P.; E Soler; H.Heinzen; E Dellacassa; M Muzzio; A Vázquez
The natives are restless , 1984
Evento: Internacional , British Council - Royal Society of Chemistry , Norwich , 1984
Palabras clave: desenvolvimiento tecnico; paises en desenvolvimiento; transferencia academica
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / estudios de la ciencia
Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Inglaterra;

Resumen
MOYNA, P.; H Soler
Compuestos triterpénicos en ceras de Rhamnaceas. , 1983
Evento: Regional , SAIQO-IPNAYS, 2a.Reunion Nacional de Química de Productos Naturales, , Santa Fe , 1983
Palabras clave: triterpenos; ceras; Rhamnaceae
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen
MOYNA, P.; E Perdomo
Seneciosis en bovinos II , 1983
Evento: Nacional , 11 Congreso de buiatría. , Paysandu , 1983
Palabras clave: bovinos; alcaloides pirrolizidinicos; Seneciosis
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen
MOYNA, P.; E Soler; H.Heinzen
Compuestos triterpénicos en ceras , 1983
Evento: Internacional , Simposio Latinoamericano sobre Flora Autóctona. , Concepcion , 1983
Palabras clave: ceras vegetales; Rhamnaceae; triterpenos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Chile;

Resumen
MOYNA, P.; H.Heinzen; E Soler
Compuestos insecticidas en ceras vegetales , 1983
Evento: Internacional , I Simposio Argentino y Latinoamericano de Farmacobotánica. , Buenos Aires , 1983
Palabras clave: ceras vegetales; insecticidas naturales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen
MOYNA, P.
Compuestos de ceras epicuticulares con posible actividad farmacológica. , 1982
Evento: Internacional , Congreso IFS sobre Screening Vegetal. , Panama , 1982
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales
Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Panamá;

Resumen

MOYNA, P.; A Ferreyro; L A

Composición de grasa de nutria. , 1981

Evento: Internacional , Congreso de Cosmetología Panamericano , Buenos Aires , 1981

Palabras clave: composicion grasa; nutria Coypus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Argentina;

Resumen

MOYNA, P.; R Perdomo; J Rodríguez; C García; H.Heinzen; S Larramendi; J Martínez; E Soler; H

Seneciosis en bovinos , 1981

Evento: Nacional , 9 Congreso de Buiatría , Paysandu , 1981

Palabras clave: alcaloides pirrolizidinicos; bovinos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; ICP Smith

C-13 N.M.R. de glicósidos , 1980

Evento: Regional , X Jornadas Rioplanteses de Farmacia y Bioquímica. , Montevideo , 1980

Palabras clave: glicósidos; C-13 NMR

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

C-13 N.M.R. de la barbaloína. , 1980

Evento: Internacional , X Reunión de Productos Naturales de IUPAC. , Tenerife , 1980

Palabras clave: NMR C-13; barbaloina

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/España;

Resumen

MOYNA, P.; F Moyna

Intoxicación por duraznillo negro en el bovino. , 1979

Evento: Nacional , 7as.Jornadas Uruguayas de Buiatría. , Paysandú , 1979

Palabras clave: Produtos naturais; toxicologia; duraznillo negro

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

E Stolovas; MOYNA, P.

Composición química de aceite de butiá. , 1979

Evento: Internacional , Congreso de Cosmetología Panamericano. , Santiago de Chile , 1979

Palabras clave: aceite de butia

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; A Ferreyro; H.Heinzen

Aceites esenciales de mentas uruguayas. , 1979

Evento: Internacional , Aceites esenciales de mentas uruguayas. , Santiago de Chile , 1979

Palabras clave: oleos essenciais; Mentha

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Chile;

Resumen

MOYNA, P.; A Bianchi Saus

Análisis de ácido valpróico por GLC. , 1979

Evento: Nacional , Jornadas del Cincuentenario de la Facultad de Química de Montevideo, , Montevideo , 1979

Palabras clave: acido valproico; GLC

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Analítica / farmacocinetica

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

La investigación científica. Su importancia en la Educación superior , 1979

Evento: Nacional , Jornadas del Cincuentenario de la Facultad de Quimica de Montevideo , Montevideo , 1979

Palabras clave: investigacion cientifica; ensenanza superior

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / bases teoricas

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

Riet Correa; F Ferreira; E Corbo; M Del Puer; M; N Suárez; A Vázquez; MOYNA, P.

Fotosensibilización hepatógena en bovinos asociada a la ingestión de Echium plantagineun. , 1977

Evento: Nacional , 5 Jornadas Uruguayas de Buiatría , Paysandú , 1977

Palabras clave: Echium plantagineum; fotosensibilizacion; bovinos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.; ICP Smith; L Bennet; B Blackwell; M Bloom; KW Butler

Organization and mobility in biological membranes as seen by deuteriumand carbon-13 nuclear magnetic resonance , 1977

Evento: Internacional , Conference on Cellular Function and Molecular Structure , Columbia , 1977

Anales/Proceedings: proceedings of the conference on cellular function and molecular structure

Palabras clave: biological membranes; mobility; nmr

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / estudio de membranas

Medio de divulgación: Papel; *Idioma/Pais:* Inglés/Estados Unidos;

Resumen

MOYNA, P.; J L; PR Izaguirre

Seneciosis en bovinos, su comprobación en Uruguay. , 1976

Evento: Internacional , II Jornadas Latinoamericanas y IV Uruguayas de Buiatría , Paysandú , 1976

Palabras clave: Seneciosis; alcaloides pirrolizidinicos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

J L; MOYNA, P.; C García; E Soler; H

C-13 N.M.R. en el estudio de polisacáridos , 1975

Evento: Internacional , X Congreso Latinoamericano de Farmacia y Bioquímica. , Punta del Este , 1975

Palabras clave: NMR Polisaccarideos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Resumen

MOYNA, P.

Esencia de Eucalyptus globulus uruguayo. , 1975

Evento: Internacional , X Congreso Panamericano de Farmacia y Bioquímica. , Punta del Este , 1975

Palabras clave: Oleo essencial; Eucalyptus

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / productos naturales

Medio de divulgación: Papel; *Idioma/Pais:* Español/Uruguay;

Texto en periódicos

Revista

MOYNA, P.

Reflexiones sobre el Año Internacional de la Química , Revista Asociación de Química y Farmacia del Uruguay , v: , p: 3940 , 2011

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Revista

MOYNA, P.

Costumbre mítica, popular y nuestra , Nutriguía para todos , v: , p: 1013 , 2009

Palabras clave: yerba mate

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Revista

MOYNA, P.

Química Verde, líquidos iónicos…¿en qué anda esa gente?" , VITRIOL , v: 8 , p: , 2008

Palabras clave: quimica verde

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Revista

MOYNA, P.

Quimica Verde , Uruguay Ciencia , v: , p: 1618 , 2007

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Revista

MOYNA, P.; E Boido; E Dellacassa; F Carrau

FML Test , Panorama vitivinicola , v: 4 , p: 2628 , 1998

Palabras clave: analisis; vinhos

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Periodicos

MOYNA, P.

The chemical basis of resistance of seeds to pathogenic fungi , Proceedings IFS Workshop on Techniques in plant insect interactions , v: , p: , 1996

Medio de divulgación: Papel; *Lugar de publicación:* Stockholm;

Periodicos

MOYNA, P.

Caracterizacion de los aceites esenciales de citricos. Nota I , Anales SAIPA 14 , v: , p: 91105 , 1996

Medio de divulgación: Papel; *Lugar de publicación:* Buenos Aires;

Periodicos

MOYNA, P.

Determinacion de cineol en eucaliptus por densitometria TLC , Anales SAIPA 14 , v: , p: 161165 , 1996

Medio de divulgación: Papel; *Lugar de publicación:* Buenos Aires;

Periodicos

MOYNA, P.

Actividad antimicrobiana de aceites esenciales , Anales SAIPA 14 , v: , p: 289295 , 1996

Medio de divulgación: Papel; *Lugar de publicación:* Buenos Aires;

Revista

MOYNA, P.

La Comercialización de los Resultados de Investigación , OMPI/GPI/MVD/95/12 , v: 1995 , p: , 1995

Palabras clave: patentes

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Revista

MOYNA, P.

Informe Final Sobre Propiedad Intelectual. Derechos de Autor y Propiedad Industrial. , conicyt bid , v: , p: , 1995

Medio de divulgación: Papel; *ISSN/ISBN:* 997436 0;

Revista

MOYNA, P.

Aportes de la ciencia y la tecnologia a la conservacion del ambiente , Condiciones para un mañana digno , v: , p: 134136 , 1994

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Periodicos

MOYNA, P.

Ceras Vegetales , Naturaleza , v: 5 , p: 33 , 1987

Palabras clave: ceras epicuticulares

Medio de divulgación: Papel; *Lugar de publicación:* Mar del Plata;

Revista

MOYNA, P.; R Strada

Phytotherapeutics in Uruguay , Newsletter of Medicinal and Aromatic Plants , v: 1987 , p: 4444 , 1987

Palabras clave: plantas medicinais; Uruguay

Medio de divulgación: Papel; *Lugar de publicación:* Budapest;

Periodicos

MOYNA, P.

Avanzamos hacia el Siglo XXI , Catalisis , v: 1985 , p: 67 , 1985

Palabras clave: academicos; investigacion cientifica

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Revista

MOYNA, P.; A Vázquez

Letter to the Editor , Education in Chemistry , v: 22 , p: 44 , 1985

Palabras clave: Explosive mixtures

Medio de divulgación: Papel; *Lugar de publicación:* London;

Sistema Nacional de

Revista

MOYNA, P.

Influencia de los sabores en los alimentos , Alimentacion latinoamericana , v: 1984 , p: 1416 , 1984

Palabras clave: colorantes naturales

Medio de divulgación: Papel; *Lugar de publicación:* Mexico;

Revista

MOYNA, P.

Contrucción de una Cámara de Cromatografía para capa fina , Asociacion de Farmacia y Bioquimica Industrial , v: 6 , p: 2223 , 1983

Palabras clave: TLC

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Periodicos

MOYNA, P.

Feeding the Famined , PHP Institute International Forum , v: 13 , p: 7374 , 1982

Palabras clave: Xerophytism; metabolitos secundarios

Medio de divulgación: Papel; *Lugar de publicación:* Tokyo;

Revista

MOYNA, P.

Plantas Medicinales , Asociacion Uruguaya de Farmacia y Bioquimica Industrial , v: 3 , p: 44 , 1980

Palabras clave: plantas medicinales

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Revista

MOYNA, P.

La investigacion cientifica. Su importancia en la Educacion Superior , Jornadas del cincuentenario de la Facultad de Quimica de Montevideo , v: , p: 2326 , 1979

Medio de divulgación: Papel; *Lugar de publicación:* Montevideo;

Revista

MOYNA, P.

Chemistry and Xerophytism , Annual Reports American Philosophical Society , v: 1975 , p: 361361 , 1975

Palabras clave: metabolitos secundarios; Xerophytism

Medio de divulgación: Papel; *Lugar de publicación:* Philadelphia;

Producción técnica

Productos

Otro , Fármacos y similares

MOYNA, P.; Pivel

Composición fotoprotectora. Patente Uruguaya 32705 , Compuestos absorbentes de luz UV , 2011

Aplicación: NO

Institución financiadora: Empresa Apoteknos (España)

Medio de divulgación: Papel; *Disponibilidad:* Irrestricta; *Ciudad:* /Uruguay

Otro , Fármacos y similares

MOYNA, P.; Diego; Pablo; Charles; Juan Manuel

Composición fotoprotectora. Patente Española 200901426 , Patente , 2009

Aplicación: NO

Patente ó Registro

Patente de invención

P200901428 , Conposición fotoprotectora

Fechas: Deposito: 18/06/2009; *Examen:* 00/00/0000; *Concesión:* 00/00/0000

Patente nacional: NO

Palabras clave: fotoprotectores

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / lofinas sustituídas
Medio de divulgación: Papel; *Disponibilidad:* Irrestricta; *Ciudad:* /España

Evaluaciones

Evaluación de Publicaciones
1995 / 2010
Nombre: Journal Natural Products,
Cantidad: Menos de 5

Formación de RRHH

Tutorías concluidas

Posgrado

Tesis de doctorado
Estudios sobre Schinus de la region sur de Brasil , 2010
Tipo de orientación: Cotutor o Asesor
Nombre del orientado: Ana Cristina Atti Santos
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química
Palabras clave: esencias de molle
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / aceites esenciales
Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado
Productos lacteos , 2009
Tipo de orientación: Cotutor o Asesor
Nombre del orientado: Cecilia Abirached
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química (UDELAR-PEDECIBA)
Palabras clave: Proteinas lacteas
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Analítica / proteinas lacteas
Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado
Hetero Diels Alder de benzotropolonas , 2005
Tipo de orientación: Cotutor o Asesor
Nombre del orientado: Daniela Gamenara
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química
Palabras clave: hetero Diels Alder oxazinas
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / Reaccion Diels Alder Estructuras
Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado
Propiedades funcionales de lactoglobulinas glicosiladas , 2005
Tipo de orientación: Cotutor o Asesor
Nombre del orientado: Alejandra Medrano
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química
Palabras clave: glicosilacion
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fotoquimica
Ciencias Naturales y Exactas / Ciencias Químicas / Química Coloidal / glicosilacion
Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Sistema Nacional de

Tesis de doctorado

Esteres de azucares en ceras vegetales , 2004

Tipo de orientación: Tutor único o principal

Nombre del orientado: Veronica Cesio

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Palabras clave: ceras vegetales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de maestría

Oleos essencias de tangerina , 2002

Tipo de orientación: Tutor único o principal

Nombre del orientado: Lilian Pedruzzi

Universidade de Caxias do Sul , Brasil , Maestria en Biotecnologia

Palabras clave: aceites esenciales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Otros, *Pais/Idioma:* Brasil/Portugués

Tesis de maestría

Biotransformacoes de alcaloides , 2001

Tipo de orientación: Tutor único o principal

Nombre del orientado: Michelle Segatto

Universidade de Caxias do Sul , Brasil , Maestria en Biotecnologia

Palabras clave: biotransformaciones

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Otros, *Pais/Idioma:* Brasil/Portugués

Tesis de maestría

Etil carbamato en vinhos da Serra Gaucha , 2000

Tipo de orientación: Tutor único o principal

Nombre del orientado: Edson Francischetti

Universidade de Caxias do Sul , Brasil , Maestria en Biotecnologia

Palabras clave: analisis vinos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / analisis vinos

Medio de divulgación: Otros, *Pais/Idioma:* Brasil/Portugués

Tesis de doctorado

Glicosidos de Solanaceae , 2000

Tipo de orientación: Cotutor o Asesor

Nombre del orientado: Silvia Soule

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Palabras clave: glicósidos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de maestría

Ceras de Semillas , 1998

Tipo de orientación: Cotutor o Asesor

Nombre del orientado: Sandra Larramendi

Facultad de Química - UDeLaR , Uruguay , Magister en Química

Palabras clave: ceras vegetales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis de maestría

Formación Ambiental , 1997

Tipo de orientación: Cotutor o Asesor

Nombre del orientado: Ana Luisa Arocena

Foro Latino Americano de Ciencias Ambientales , Argentina , Formación Ambiental

Palabras clave: quimica medioambiental

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / quimica medioambiental

Medio de divulgación: Otros, *Pais/Idioma:* Argentina/Español

Tesis de doctorado

Quimica y Biologia de Solanaceae , 1997

Tipo de orientación: Cotutor o Asesor

Nombre del orientado: Alvaro Vazquez

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Palabras clave: alcaloides solanaceas

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado

Biotransformacion de productos Naturales , 1995

Tipo de orientación: Cotutor o Asesor

Nombre del orientado: Pilar Menendez

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Palabras clave: biotransformacion terpenos

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado

Aceites Esenciales , 1995

Tipo de orientación: Cotutor o Asesor

Nombre del orientado: Eduardo Dellacassa

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Palabras clave: aceites esenciales

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado

Efecto genotoxico, mutagenico y recombinogenico de los alcaloides isoquinolinicos en celulas procariotas y eucariotas. , 1994

Tipo de orientación: Tutor único o principal

Nombre del orientado: Mirian Salvador

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Palabras clave: alcaloides

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado

Sintesis de perrotetinas y analogos , 1994

Tipo de orientación: Cotutor o Asesor

Nombre del orientado: Enrique Pandolfi

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Palabras clave: polifenoles

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado
Utilizacion de productos naturales como selectores de levaduras fusionadas , 1993
Tipo de orientación: Tutor único o principal
Nombre del orientado: Luciana Atti Serafini
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química
Palabras clave: alcaloides
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis de maestría
Estudio de ceras epicuticulares , 1991
Tipo de orientación: Tutor único o principal
Nombre del orientado: Enrique Pandolfi
Facultad de Química - UDeLaR , Uruguay , Magister en Química
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado
Esencias de Lippia , 1985
Tipo de orientación: Tutor único o principal
Nombre del orientado: Eduardo Soler
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química
Palabras clave: aceites esenciales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado
Isomerizacion cis-trans de acidos grasos , 1983
Tipo de orientación: Tutor único o principal
Nombre del orientado: Antonia Grompone
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química
Palabras clave: acidos grasos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado
Esencias de Mentha , 1979
Tipo de orientación: Cotutor o Asesor

Nombre del orientado: Miriam Bigo
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química
Palabras clave: esencia mentha
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Grado

Tesis/Monografía de grado
Estudio de almidones de maiz por NMR de LIs. , 2009
Nombre del orientado: Adriana Garcia
Facultad de Química - UDeLaR , Uruguay , Licenciatura en Química
Palabras clave: analisis polisacaridos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / polisacaridos
Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis/Monografía de grado
Sintesis de derivados de la lofina , 2006
Nombre del orientado: Diego Fort
Facultad de Química - UDeLaR , Uruguay , Licenciatura en Química
Palabras clave: fotoquimica imidazoles
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fotoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis/Monografía de grado
Tesina Final de Ingeniero Agronomo , 1978
Nombre del orientado: C. Spangenberg
Facultad de Agronomía - UDeLaR , Uruguay , Ingeniería Agronómica
Palabras clave: metodos fitoquimicas
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tesis/Monografía de grado
Tesina Final de Ingeniero Agronomo , 1976
Nombre del orientado: J. Gomez
Facultad de Agronomía - UDeLaR , Uruguay , Ingeniería Agronómica
Palabras clave: fitoquimica
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Otras

Iniciación a la investigación
Investigación sobre tratamiento de biomasa con líquidos iónicos , 2011
Tipo de orientación: Tutor único o principal
Nombre del orientado: Luis Reina
Facultad de Química - UDeLaR , Uruguay
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Fotoquímica de heterocompuestos , 2010
Tipo de orientación: Tutor único o principal
Nombre del orientado: Jaime Franco
Facultad de Química - UDeLaR , Uruguay
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fotoquimica
Pais/Idioma: Uruguay/Español

Iniciación a la investigación
fotoquimica aplicada , 2006
Nombre del orientado: Carlos Tabarez
Facultad de Química - UDeLaR , Uruguay , Espectroscopía de Compuestos Orgánicos
Palabras clave: fotoquimica
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fotoquimica
Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
PEDECIBA-Secundaria , 2006
Nombre del orientado: Ana Lia Cambon
Facultad de Química (UDELAR-ANEP) - UDeLaR , Uruguay , Química
Palabras clave: quimica de productos naturales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Estudios sobre propoleos , 2005
Nombre del orientado: Sebastian De Paula
Facultad de Química - UDeLaR , Uruguay , Productos de Colmena y Apiterapia
Palabras clave: propolis
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Analítica / flavonoides
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Quimiotaxonomia de Palmae , 2002
Tipo de orientación: Tutor único o principal
Nombre del orientado: Natalia Paroul
Facultad de Química - UDeLaR , Uruguay , Doctorado en Química
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Aceites esenciales , 2001
Nombre del orientado: Elbio Burlani
Universidade de Caxias do Sul , Brasil
Palabras clave: aceites esenciales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Brasil/Portugués
Información adicional: Iniciación científica

Iniciación a la investigación
Biotransformaciones de productos naturales , 2000
Nombre del orientado: Marciano Rubini
Universidade de Caxias do Sul , Brasil
Palabras clave: biotransformaciones

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Brasil/Portugués
Información adicional: Iniciación científica

Iniciación a la investigación
Aceites esenciales , 2000
Nombre del orientado: Giovanna Buogo
Universidade de Caxias do Sul , Brasil
Palabras clave: aceites esenciales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Brasil/Español
Información adicional: Iniciación científica

Iniciación a la investigación
Quimiotaxonomia de Palmae , 1999
Nombre del orientado: Cristiano Della Rosa
Universidade de Caxias do Sul , Brasil
Palabras clave: quimiotaxonomia Palmae
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Brasil/Portugués

Iniciación a la investigación
Biotransformaciones , 1999
Nombre del orientado: Cinthia Panarotto
Universidade de Caxias do Sul , Brasil
Palabras clave: biotransformaciones
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Brasil/Portugués
Información adicional: Iniciación científica

Iniciación a la investigación
Aceites esenciales , 1994
Nombre del orientado: Andres Gonzalez
Facultad de Química - UDeLaR , Uruguay
Palabras clave: aceites esenciales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Derivados dicetonicos de ceras , 1994
Nombre del orientado: Sonia Rodriguez
Facultad de Química - UDeLaR , Uruguay
Palabras clave: actividad triterpenos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Resonancia Nuclear Magnetica , 1993
Nombre del orientado: Guillermo Moyna
Facultad de Química - UDeLaR , Uruguay
Palabras clave: nmr
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / metodos espectroscopicos

Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Aceites Esenciales , 1993
Nombre del orientado: Carmen Rossini
Facultad de Química - UDeLaR , Uruguay
Palabras clave: aceites esenciales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Becario PEDECIBA , 1989
Nombre del orientado: Danilo Davyt
Facultad de Química - UDeLaR , Uruguay
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Polisacaridos , 1985
Nombre del orientado: Fernando Ferreira
Facultad de Química - UDeLaR , Uruguay
Palabras clave: polisacaridos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Metodos simples de analisis , 1984
Nombre del orientado: Jorge Martinez
Facultad de Ingeniería - UDeLaR , Uruguay
Palabras clave: espectrofotometria AA
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / metodos analiticos
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Aceites esenciales , 1983
Nombre del orientado: Miguel Muzzio
Facultad de Química - UDeLaR , Uruguay
Palabras clave: aceites esenciales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Metodos espectrofotometricos de analisis , 1983
Nombre del orientado: Maria Elena Villamil
Facultad de Ingeniería - UDeLaR , Uruguay
Palabras clave: espectrofotometria AA
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / metodos analiticos
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Espectrofotometria de trazas , 1983
Nombre del orientado: Jorgelina Palma
Facultad de Ingeniería - UDeLaR , Uruguay
Palabras clave: espectrofotometria AA
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / metodos analiticos
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Cromatografia gaseosa , 1983
Nombre del orientado: Aldo Bologna
Facultad de Ingeniería - UDeLaR , Uruguay
Palabras clave: cromatografia gaseosa
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / metodos analiticos
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Ceras epicuticulares , 1983
Nombre del orientado: Horacio Heinzen
Facultad de Química - UDeLaR , Uruguay
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Ceras epicuticulares , 1982
Nombre del orientado: Eduardo Manta
Facultad de Química - UDeLaR , Uruguay
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Ceras epicuticulares , 1980
Nombre del orientado: Jorge Toth
Facultad de Química - UDeLaR , Uruguay
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Ceras de Colletia , 1980
Nombre del orientado: Edgardo Laborde
Facultad de Química - UDeLaR , Uruguay
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
alcaloides simples , 1979
Nombre del orientado: Cecilia Fernandez
Facultad de Química - UDeLaR , Uruguay
Palabras clave: alcaloides simples
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Ceras epicuticulares , 1979
Nombre del orientado: Haydee Acosta
Facultad de Química - UDeLaR , Uruguay
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Alcaloides simples en Cactaceaes del genero Opuntia , 1978
Nombre del orientado: Ramon Tubio
Facultad de Química - UDeLaR , Uruguay
Palabras clave: alcaloides cactaceae
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Colorantes naturales , 1977
Nombre del orientado: Carlos Silvera
Facultad de Química - UDeLaR , Uruguay
Palabras clave: colorantes naturales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Ceras epicuticulares , 1977
Nombre del orientado: Gerardo Ramos
Facultad de Química - UDeLaR , Uruguay
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
NMR de polisacaridos , 1977
Nombre del orientado: Hector Casal
Facultad de Química - UDeLaR , Uruguay
Palabras clave: polisacaridos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Alcaloides vegetales , 1977
Nombre del orientado: Jorge Altamirano
Facultad de Química - UDeLaR , Uruguay
Palabras clave: alcaloides senecio
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Colorantes naturales , 1977
Nombre del orientado: Jose Luis Di Fabio
Facultad de Química - UDeLaR , Uruguay
Palabras clave: polisacaridos
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Cromatografia gaseosa , 1977
Nombre del orientado: Carlos Morato
Facultad de Química - UDeLaR , Uruguay
Palabras clave: cromatografia
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Ceras epicuticulares , 1977
Nombre del orientado: Juana Hughes
Facultad de Química - UDeLaR , Uruguay
Palabras clave: ceras vegetales
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Alcaloides vegetales , 1976
Nombre del orientado: Miguel Castilgioni
Facultad de Química - UDeLaR , Uruguay
Palabras clave: alcaloides senecio
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Ensayos fotoquimicos , 1969
Nombre del orientado: Daniel Guidali
Facultad de Química - UDeLaR , Uruguay
Palabras clave: reacciones fotoquimicas
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fotoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación
Alcaloides de Cactaceae , 1969
Nombre del orientado: Victor Diaz
Facultad de Química - UDeLaR , Uruguay
Palabras clave: alcaloides cactaceae
Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica
Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Iniciación a la investigación

Azucares libres en flores de Palmae , 1969

Nombre del orientado: Graciela Galante

Facultad de Química - UDeLaR , Uruguay

Palabras clave: azucares libres

Areas del conocimiento: Ciencias Naturales y Exactas / Ciencias Químicas / Química Orgánica / fitoquimica

Medio de divulgación: Otros, *Pais/Idioma:* Uruguay/Español

Tutorías en marcha

Posgrado

Tesis de doctorado

Gestión y Acreditación de procesos educativos en química , 2011

Tipo de orientación: Tutor único o principal

Nombre del orientado: Mónica Rosadilla

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Tesis de doctorado

Plantas nativas con propiedades insecticidas , 2010

Tipo de orientación: Cotutor o Asesor

Nombre del orientado: AnaBertucci

Facultad de Química - UDeLaR , Uruguay , Doctorado en Química

Medio de divulgación: Papel, *Pais/Idioma:* Uruguay/Español

Otros datos relevantes

Premios y títulos

1998 Profesor emerito Facultad de Quimica; Universidad de la Republica, URUGUAY

1982 Mencion especial. Premio Internacional Rolex Rolex GmbH

1986 Mencion Especial. Premio Internacional Rolex Rolex GmbH

1994 Miembro Correspondiente Academia Argentina de Farmacia y Bioquímica

1986 Vice Presidente III Reunión Latinoamericana de Ciencias Farmacéuticas

1987 Coordinador de la Primera Reunión Sociedad Latinoamericana de Fitoquímica

1993 Integrante del Comite Científico Nacional I Congreso de la FEFAS y II Congreso de Ciencias Farmacéuticas del Cono Sur

1996 Presidente VIII Simposio Latinoamericano de Farmacobotánica

1996 Chairperson TGO-4 Oral Presentation Session. CHEMRAWN IX

1998 Presidente del Comité Organizador XI CHEMRAWN

1990 Coordinador regional International Organization for Chemistry in Development (IOCD)

1998 Miembro pleno Comité CHEMRAWN de IUPAC

2005 Fellow of the Royal Society of Chemistry (London) Royal Society of Chemistry (London)

2004 Fellow de IUPAC IUPAC

2002 Presidente Tribunal Premio Iberoeka 2002 Iberoeka

1978 Miembro (Nacional) Comisión Fulbright

Jurado/Integrante de comisiones evaluadoras de trabajos académicos

Disertaciones

Candidato: Ana Cristina Atti dos Santos

MOYNA, P.

Productos Naturales , 2000

Disertación (Maestria en Biotecnologia) - Universidade de Caxias do Sul - Brasil

Referencias adicionales: Brasil , Portugués

Disertaciones

Candidato: Ivete Moschen Pistoriello

MOYNA, P.

Biotecnologia na Agricultura e Agroindustria , 1997

Disertación (Maestria en Biotecnologia) - Universidade de Caxias do Sul - Brasil

Referencias adicionales: Brasil , Portugués

Disertaciones

Candidato: Stela Maris Kuze Rates

MOYNA, P.

plantas medicinales de Rio Grande do Sul , 1989

Disertación (Ciências Farmacêuticas) - Universidade Federal do Rio Grande do Sul - Brasil

Referencias adicionales: Brasil , Portugués

Tesis

Candidato: Marcelo Rossato

MOYNA, P.

Taxonomy of Palmae , 2007

Tesis (Agronomia) - Universidade Federal de Pelotas - Brasil

Referencias adicionales: Brasil , Portugués

Tesis

Candidato: Emma Parente

MOYNA, P.

Uso de aceites de ñandu en cosmetica , 2006

Tesis (Doctorado en Química) - Facultad de Química - UDeLaR - Uruguay

Referencias adicionales: Uruguay , Español

Tesis

Candidato: Francisco Carrau

MOYNA, P.

Influencia del nitrogeno en la composicion aromatica de vinos , 2003

Tesis (Doctorado en Química) - Facultad de Química - UDeLaR - Uruguay

Referencias adicionales: Uruguay , Español

Tesis

Candidato: Geraldo Coelho

MOYNA, P.

Saponinas de yerba mate , 2000

Tesis (Ciências Farmacêuticas) - Universidade Federal do Rio Grande do Sul - Brasil

Referencias adicionales: Brasil , Portugués

Tesis

Candidato: Flavio Henrique Reginatto

MOYNA, P.

Matesaponinas , 2000

Tesis (Ciências Farmacêuticas) - Universidade Federal do Rio Grande do Sul - Brasil

Referencias adicionales: Brasil , Portugués

Tesis

Candidato: Eduardo Savio

MOYNA, P.

Uso de radiotrazadores en farmacocinetica , 1994

Tesis (Doctorado en Química) - Facultad de Química - UDeLaR - Uruguay

Referencias adicionales: Uruguay , Español

Tesis

Candidato: Marta Vazquez

MOYNA, P.

Farmacocinetica de antidepresivos , 1993

Tesis (Doctorado en Química) - Facultad de Química - UDeLaR - Uruguay

Referencias adicionales: Uruguay , Español

Tesis

Candidato: Brenda Mester

MOYNA, P.

sintesis de heterociclos , 1989

Tesis (Doctorado en Química) - Facultad de Química - UDeLaR - Uruguay

Referencias adicionales: Uruguay , Español

Tesis

Candidato: Janice Chambers

MOYNA, P.

PhD , 1987

Tesis (Doctorate in Chemistry) - University of the West Indies - Jamaica

Referencias adicionales: Jamaica , Inglés

CV of Carlos A. Tollinche, Ph.D.

Dr. Carlos A. Tollinche has over twenty years of progressive pharmaceutical industry experience in a variety of product categories, including parenterals (LVP, SVP), solid dosage forms, potent compounds, biotechnology and chemically synthesized active pharmaceutical ingredients (API's) in multi-product plant as well as multi-plant site scenarios. He served in various scientific and management positions in an active, hands-on capacity for the PR operations of Warner Lambert; Merck; E.R. Squibb & Sons and Bristol-Myers Squibb. His experience was equally divided between technical operations, regulatory and documentation control, and validation roles. Moreover, he successfully managed numerous tech transfer projects, plant commissioning & validations projects, cost control / cost reduction, overseen lab / pilot plant facility design / construction projects, organizational transition projects of various sizes and complexities.

At present, Carlos is a consultant in technical operations as well as Director of Scientific Affairs at INDUNIV (Industry-University) Research Consortium, a non-profit organization that has existed for 30 years. This organization is dedicated towards promoting and catalyzing effective collaboration among the sectors of academia, industry and government to stimulate knowledge base capabilities.

In its role with INDUNIV, he manages the research grants program through the Scientific Affairs Committee which is made up of Sr. Technical and QC Operation professionals from member companies. Also, Carlos liaise with the centers of excellence formed by INDUNIV: Center for Material Characterization (MCC), Pharmaceutical Processing Research (CPPR)-UPR. He is a member of Steering Committees of the Health Care Council (Clinical Research Initiative); PR Bioscience Alliance; as well as the Pharmaceutical cluster. Through the cluster's development process, Carlos was part of the Advisory Board of the PR Life Sciences Roadmap. The latter initiative was geared towards transforming PR and inserting the island into becoming an important player in the global knowledge economy. In the education & scientific liaison role, he works with industry, regulatory agencies and the universities in the development of specific training programs, facilitated with PR Industrial Development Company (PRIDCO), the Committee for the design & construction of the Bio Dev & Training Center.

Supporting the workforce development efforts, Carlos has helped create two of the current translational knowledge conferences that manages IDNUNIV om an annual basis:

- Annual Process Analytical Technology (PAT) & Quality by Design (QbD) Summit
- Annual Colloquium or the Industry-Academia Encounter a dialogue space aimed at enhancing workforce skills

For the last 11 years, Carlos has represented INDUNIV within the Council of States Bioscience Association (CSBA), an affiliate of BIO. Conversely, for the last three years, he is actively involved in the new BIO affiliate Coalition of State Bioscience Institutes (CSBI) which focuses efforts and programs towards developing bioscience entrepreneurs, strengthen STEAM education at the K-12 levels and workforce development.

Also, Carlos belongs to several industry advisory boards/committees within the University of PR. System and the Pontifical Catholic University of PR. The aim of all of this involvement is to expand the scope of the curricula towards the development of professionals with the skills and preparation necessary to attend industry current as well as future talent capital requirements for the 21st Century.

Furthermore, Carlos is involved, as a member, in various professional organizations: among them, the American Chemical Society, the PR Professional Chemists Association, at the International Union of Pure and Applied Chemistry (IUPAC) has been a delegate (since 2003) and leader of the four member delegation from PR (since 2013) and titular member of the CHEMRAWN Committee. He has represented the PR Chemists Association in international chemical congresses in Cuba (2002), Mexico (2002 & 2012 CLAQ), Cartagena (2010 CLAQ), IUPAC Congress & General Assemblies in Ottawa (2003), Beijing (2005), Turin (2007), Glasgow (2009), San Juan (2011) more recently in Istanbul, Turkey (August 2013).

During his professional career, Carlos has received several awards, among them: Puerto Rico Chemists Association awards: Máximo Galardón Premio Dr. Osvaldo Raimirez-Torres (2005), Award Industrial Chemist (1997) - two times Presidential Award (1988 and 2004); Bristol-Myers Squibb Presidential Award (1996 & 1995); Bristol-Myers Squibb Quality and Productivity Award (1992).

He holds a Ph.D. in Chemistry from Penn State University (University Park, PA.), a bachelor in Chemistry from Pontificia Universidad Católica de PR; completed the Leadership Development Program of the National Leadership Institute at University of Maryland; a licensed Chemists in the Commonwealth of PR. Carlos is also a Past President of the PR Professional Chemists Association (2002 – 2003) and served as Board Member from 2001 – 2004. He is Past President of the Federation of Latin American Chemical Associations (FLAQ)[President during 2008-2010 term] and Past Vice Chairman of the Organizing Committee for the 43rd World Chemistry Congress 46th General Assembly held in San Juan, PR from July 30th – August 7, 2011.

PIETRO ROSARIO TUNDO

Projects and activities within IUPAC

- Chairman and founder of the Working Party on Synthetic Pathways and Processes in Green Chemistry (July 1991).
- Founder and chairman (until 2007) of the Sub-Committee on Green Chemistry (Division III)
- Chairman of the Sub-Committee on Green Chemistry (Division III) (2012 -...)
- Titular Member of Division III (2003-2006)
- President of the IUPAC Division III in the biennium 2007-2008
- Member of the Sub-Committee on Structural and Mechanistic Chemistry (Division III)
- Member of the Sub-Committee on Green Chemistry (Division III)

- **IUPAC Conferences**

- IUPAC Workshop on Green Chemistry Education - Venice, September 2001 (in collaboration with OECD).
- Founder of the IUPAC International Conference Series on Green Chemistry and Chairman of the 1st one (ICGC-1); Dresden – Germany - September 2006.
- 2nd International Conference on Green Chemistry (ICGC-2), Moscow, Russia; 14-20 September, 2008
- 3rd International Conference on Green Chemistry (ICGC-3), Ottawa, Canada; 15–18 August 2010
- 4th Conference on Green Chemistry, (ICGC-4); Foz do Iguanzu, Brazil, 23-27 August 2012.
- 5th Conference on Green Chemistry (ICGC-5); Durban, South Africa, 17-23 August 2014.
- 6th Conference on Green Chemistry (ICGC-6) will be held in Italy, Venice, September 2016.

- **Current Projects**

member: Project No. 2007-025-1-300: Chemical issues in biomass burning in Sub-Saharan Africa
member: Project No. 2013-036-2-300: Glossary on Renewable Chemistry
member: Project No. 2013-041-3-300: Green Chemistry in Higher Education: toward a green chemistry curriculum for Latin American and African universities
chairman: Project No. 2013-057-3-300: Chemistry Beyond Chlorine

- **Completed Projects**

chairman: Project No. 1999-007-1-300: White Book and Symposium-in-print on Green Chemistry
chairman: Project No. 2002-018-1-300: Green Chemistry in Africa
chairman: Project No. 2002-029-1-300: A IUPAC coordinated web page on Green/Sustainable Chemistry
chairman: Project No. 2002-064-1-300: Green Chemistry in Latin America
chairman: Project No. 2003-026-1-300: Green chemistry in Russia
chairman: Project No. 2003-043-1-300: Green chemistry in the Arab region
chairman: Project No. 2005-015-1-300: "Global Climate Change" - Translation and Dissemination of a monograph for Secondary Schools
chairman: Project No. 2008-016-1-300: "Chlorine-free syntheses for green chemistry"

- **Special Issues of Pure and Applied Chemistry on Green Chemistry**

The first Special Topic issue dedicated to green chemistry was published on Pure and Applied Chemistry on July 2000 [Pure Appl. Chem. 72, 1207–1403 (2000)].
Since then, four collections of scientific papers have been published, coming up from the IUPAC Series of International Conferences on Green Chemistry:

• 1st International Conference on Green Chemistry (ICGC-1), Dresden, Germany, 10–15 September 2006: Pure Appl. Chem. 79, 1833–2100 (2007)
• 2nd International Conference on Green Chemistry (ICGC-2), Moscow, Russia, 14–20 September 2008: Pure Appl. Chem. 81, 1961–2129 (2009)
• 3rd International Conference on Green Chemistry (ICGC-3), Ottawa, Canada, 15–18 August 2010: Pure Appl. Chem. 83, 1343–1406 (2011)
• 4th International IUPAC Conference on Green Chemistry (ICGC-4), Foz do Iguaçu, Brazil, 25-29 August, 2012

- Latest Special Topic Issue published by Pure Applied Chemistry, was on :"Chlorine-free Synthesis for Green Chemistry: Beyond-chlorine", **84**, *3* (March 2012).

Curriculum vitae (updated June 2nd, 2015)

- **PERSONAL INFORMATION**

Researcher ID: F-7871-2015
Nationality: Italian
Date of birth: October 16th, 1945
URL for web site:http://www.unive.it/data/persone/5591778/pubb_tipo

- **EDUCATION**

1969 Degree on Chemistry, University of Bologna, 1st class honors.

- **CURRENT POSITION**

1989 - 2015: Professor of Organic Chemistry at the University of Venice, Ca' Foscari.

- **RELEVANT PREVIOUS POSITIONS**

1979-81 Guest researcher at T&M University, College Station (Texas); and 1981-82 Guest researcher at Syracuse University (New York); 1989-90 Guest researcher at Clarkson College of Technology, Potsdam (New York).

- **FELLOWSHIPS AND AWARDS**

1982 American Chemical Society's Kendall Award (with Janos Fendler).
1997 "An Intelligent Future" award from Federchimica (Italian association of chemical industries).

- **ORGANIZED CONFERENCES AS CHAIRMAN OR CO-CHAIRMAN**

- I have established the series and directed ten Summer Schools on Green Chemistry in Venice (first edition held on 1998, tenth edition on 2007), seven of which were sponsored by the EU. Over the ten editions, roughly 600 PhD and Post Doc students attended.
- Symposium on "Green Chemistry: a tool for socio-economic development and environmental protection". ESOF European Science Open Forum, Munich (Germany), 15-19 July, 2006.
- NATO-ASI Workshop on New organic chemistry reaction and methodologies for green productions, Lecce and Otranto (Italy), 30 October- 10 November 2006.
- Upon appointment by the Italian Minister of Research (L. Moratti), I organized the Carnegie Group Meeting between the Ministers of Education and Research of G8 Countries; Venice, 5-7 December 2004.

- **INSTITUTIONAL RESPONSIBILITIES**

1998 – at present - Faculty member, University of Venice Italy

1993 – 2009 I have founded: the Interuniversity Consortium "Chimica per l'Ambiente" (Chemistry for the Environment), INCA, embodying 31 Italian Universities on 2008; - The Laboratory of INCA at Marghera (design and direction); and other six INCA Laboratories in Italy.
2005 - 2015 - Chairman of MEGREC. This voluntary association of Green Chemistry Institutions of Mediterranean Countries (Egypt, Italy, Morocco, Tunisia, Algeria, Serbia, Greece and Spain) seated in Italy was founded in Belgrade on 2005.

- **COMMISSIONS OF TRUST**

2006 - 2015 - UNESCO chair on Green Chemistry, UNITWIN Network 731 with seat at Venice University.
2004 - 2006 - Member of the Advisory Board of the Green Chemistry, Monash University, Australia
2004 - 2005 - Member of the Evaluation Panel of SUNARE Project, Academy of Finland.
2014 - Peer Review of Portuguese Foundation for Science and Technology Research Units on behalf of the European Science Foundation.
2013 - 2015 - Member of the PhD Programmes Evaluation Panel - FCT Portugal on behalf of the European Science Foundation.
1996 - Italian Representative on OECD for Sustainable Chemistry OECD's Programme.
2013 - 2015 - Member and President of the Italian National Committee for IUPAC.
1995 - 2015 - Evaluator of Industrial projects for the Italian Ministries for Research and for Industry.
2010 - 2015 - Evaluator of research Projects (SIR, PRIN and Montalcini) of the Italian Ministry for Research.
2014 - 2015 - Member of the International Jury of the Phosagro/UNESCO/IUPAC Award on Green Chemistry.

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

2007 - 2009 - President of the IUPAC Division III (Organic and Biomolecular Chemistry).
1995 at present - Chairman of the IUPAC S/C on Green Chemistry
2000 at present - Chairman of WP on "Green and Sustainable Chemistry" of Euchems (European Association for Chemical and Molecular Sciences)
1903 - 2009 - President of the Interuniversityt Consortium "Chemistry for the Environment", INCA

- Membership to editorial Boards of International Journals:
2000 - 2013 Int. Ed. Board- Green Chemistry, RSC
2007 - 2015 Int. Advisory Board ChemSusChem, Wiley
2014 - 2015 Editorial Board ScienceOpen, GmbH, Berlin.
2006 - 2010 Director of the bimonthly magazine for Secondary Schools "Green. La Scienza al Servizio dell'Uomo e dell'Ambiente"

Ten years track-record

- **Scientific Leadership Profile**

I am a scientist with a high international profile [h-index 33 since 1985, 2979 citations (ISI). 271 Papers and 40 patents] who has made substantial improvement in a number of fields of chemistry. I have invented a continuous-flow system based on phase-transfer catalysis (Gas-Liquid Phase Transfer-Catalysis, GL-PTC) which is currently used in industry for the manufacturing of aryl ethers.
I have reported for the first time: - The reaction of mono-methylation of CH_2 acidic compounds based on dimethyl carbonate and its unusual mechanism; this process led to patents in Europe, USA, and Japan and concerns the production of 2-aryl propionic acids (anti-inflammatory drugs such as ibuprofen, ketoprofen,

naproxen); – The selective mono-methylation of aromatic amines; - The selective carboxymetylation of aromatic amines; - The synthesis of solvents with very low toxicity, used on water-based varnishes; - New pathways and cyclisation reactions based on organic carbonates for fine chemicals (now utilized by ICI, Givaudan, for fragrances synthesis; - New reaction pathways for the synthesis of cyclic urethanes (1,3-oxazinan-2-ones). - How to domesticate war chemistry: macrocyclic ethers from mustard carbonates.
In the field of reactions of dialkyl carbonates, I am the foremost researcher/academic having published the greatest number of scientific papers (ISI: 60 since 1985).

The many fields of research I have learnt and produced results within (supramolecular chemistry, phase-transfer catalysis, continuous-flow processes, photo-induced processes, artificial photosynthesis, catalysis and zeolites, detoxification methods, green chemistry understanding) are now directed toward carbonate chemistry.

- **Representative Publications**

- Grego, Sandra; Arico, Fabio; Tundo, Pietro. Highly Selective Phosgene-Free Carbamoylation of Aniline by Dimethyl Carbonate under Continuous-Flow Conditions - ORGANIC PROCESS RESEARCH & DEVELOPMENT,17, 679-683 (2013).
- Arico, Fabio; Tundo, Pietro; Maranzana, Andrea; et al. Synthesis of Five-Membered Cyclic Ethers by Reaction of 1,4-Diols with Dimethyl Carbonate – CHEMSUSCHEM, 5, 1578-1586 (2012).
- Arico, Fabio; Toniolo, Umberto; Tundo, Pietro. 5-Membered N-heterocyclic compounds by dimethyl carbonate chemistry - GREEN CHEMISTRY,14, 58-6 Green Synthesis of Dimethyl Isosorbide CHEMSUSCHEM, 3, 566-5 (2010).
- Tundo, Pietro; Arico, Fabio; Rosamilia, Anthony E.; et al. Reaction of dialkyl carbonates with alcohols: Defining a scale of the best leaving and entering groups – PURE AND APPLIED CHEMISTRY, 81, 1971-1979 (2009).
- Arico, Fabio; Toniolo, Umberto; Tundo, Pietro 5-Membered N-heterocyclic compounds by dimethyl carbonate chemistry - GREEN CHEMISTRY,14, 58-61 (2012).
- Tundo P., Arico F., Gauthier G., Rossi, L., Rosamilia A:, Bevinakatti H., Sivert R., Newman C., Green Synthesis of Dimethyl Isosorbide, CHEMSUSCHEM, 3, 566-570 (2010).
- Rosamilia A., Aricò F., Tundo P., Insight into the Hard-Soft Acid-Base Properties of Differently Substituted Phenylhydrazines in Reactions with Dimethyl Carbonate.JOURNAL OF PHYSICAL CHEMISTRY B, 112, 14525-14529 (2008).
- Rosamilia A., Aricò F., Tundo P.. Reaction of the ambident electrophile dimethyl carbonate with the ambident nucleophile phenylhydrazine. JOURNAL OF ORGANIC CHEMISTRY,73, 1559-1562 (2008).
- Tundo P., Rossi L., Loris A. Dimethyl carbonate as an ambident electrophile. JOURNAL OF ORGANIC CHEMISTRY 70, 2219-2224 (2005).
- Tundo P., Perosa A., Multiphasic heterogeneous catalysis mediated by catalyst-philic liquid phases , CHEMICAL SOCIETY REVIEWS, 36, 532-550 (2007).

- **Books, Edited books, Collective publications and Series of books as Chief Editor.**

I am the sole Author the book "Continuous Flow Methods in Organic Synthesis", H. Horwood Publisher, pp. 1-378 (1991). A new Single Author book "The Chemistry of Dimethyl Carbonate", will be published in July 2016 (*contract signed with Wiley and Sons, N.J.).*
- I am Editor in Chief (with J. Andraos) of the new Series of Book "Green Syntheses" Published by CRC Press. Volume I was published on June 2014.
- I am co-Editor in Chief of the Series of Books "Green Chemistry and Sustainable Technology", Spinger. 2014-
- P. Tundo, V. Esposito "Green Chemical Reactions", Springer Ed. 2008 ISBN: 978-1-4020-8456-0
- P. Tundo A. Perosa and F. Zecchini Editors: Methods and Reagents for Green Chemistry , Wiley, 2007, ISBN: 978-0-471-75400-8
- P. Tundo, W. Hölderich, W. Reschetilowski and F. Aricò, Editors: Special Issue of Pure and Applied Chemistry 2007. Proceedings from IUPAC 1st International Conference on Green-Sustainable Chemistry.
- P. Tundo et al, Editors: "Chlorine-Free Synthesis for Green Chemistry". Special issue of Pure and Applied Chemistry, 84, No. 3 (2012).
- Editor or co-editor of 11 Books of the G*reen chemistry series* Published by INCA.
- 5 Book chapters

- **Granted Patents**

1. P. Tundo and M. Selva, (2007). Synthesis of mono-N-substituted functionalized anilines. 03029005.0. Concessione 1431274-2007
2. P. Tundo, R. Mangano and L. Riva (2009). Water-based coating composition containing dialkyl carbonates having ether functions as coalescent agents and use therof. WO/2009/147469, Lechler S.p.A. & INCA.
3. P. Tundo, S. Grego, M. Rigo, R. Paludetto (2010). Process for the production of Aromatic Urethanes. EP2199278A1, DOW.
4. Patrick Fuertes, Mathias Ibert, Emilie Josien, Pietro Tundo, Fabio Aricò (2013). Method for preparing dialkylcarbonates of dianhydrohexitol. US 8,399,601 B2, EU, WO2011/039483A1
5. H. Bevinakatti, C. Newman, S. Ellwood, P. Tundo, F. Aricò, M. Schroeder (2013). Cyclic ether. ICI to Givaudan. US 8,536,349 B2; EU 2178871; WO200901079; Japan JP5409619; China ZL 200880024304.4; Mexico 313779. Applications pending in India and Brazil.

- **Top 10 invited presentations.**

- 40th IUPAC Congress – Beijing, China, 14-19 August, 2005.
- 10th Annual Green Chemistry & Engineering Conference, Washington, USA, 25-27 June 2006.
- VII Conference on Mechanisms of Catalytic Reactions S. Petersburg, Russia 2-4 July, 2006.
- XV Congreso Argentino de Catálisis - 4.to Congreso de Catálisis del Mercosur, La Plata, Argentina, 12-16 November 2007.
- 236th ACS National Meeting– Philadelphia (USA) - 17-21August, 2008. Dedicated symposium.
- Symposium "CO2, a waste or a raw material. Fate or Opportunity" Toulouse, France, 16-17 December 2008.
- China-EU Workshop on "Clean Production Technologies", Beijing, March 17-19, 2010.Organized by the EU Commission.
- 4th IUPAC International Comference on Green Chemstry, Plenary Speaker, Foz de Iguanzu, Brazil August 2002.
- 4th Congress of the European Association for Chemical and Molecular Sciences, KeyNote speaker, Istanbul August 2003. Dedicated Symposium on Green Chemistry.
  5th IUPAC International Conference on Green Chemstry, Plenary Speaker, Durban, South Africa, August 2004.

- **Contribution to early careers of excellent researchers.**

The scientific projects, the summer schools on green chemistry, the Interunivesity Consortium "Chemistry for the Environment, INCA, the collaborations with IUPAC, UNESCO and many Chemical Societies, offered me to meet many young scientists, all of them extremely motivated in pursuing good research and green chemistry. Many of them presently hold prestigious positions in their Country; I remind not only colleagues in Italy but, just to mention a few, also in Russia, China, India, Tanzania, Egypt, Rumania, Netherlands, France, Thailand, Australia, Argentina, México, Brazil, USA, UK. In all of these Countries I am familiar with chemists with whom I had a relation on Research or/and on Education.

International Union of Pure and Applied Chemistry (IUPAC)

Committee on Publications and Cheminformatics Data Standards

Report to Council, August 2015

Bonnie Lawlor, Committee Chair

Executive Summary

The IUPAC Committee on Publications and Cheminformatics Data Standards (CPCDS) has spent the past eighteen months on the following initiatives:

- The finalization of the transition of IUPAC's publications, *Pure and Applied Chemistry* (*PAC*) and *Chemistry International* (*CI*), to the Walter De Gruyter GmbH Publishing House. The transition for *Pure and Applied Chemistry* (*PAC*) is finished and production is now running smoothly (see page 2 for details). *CI* faces two challenges: 1) while production has improved, problems remain primarily because De Gruyter's production system was built to support the structure of traditional scholarly journals, not news journals (see page 3 for details); and 2) IUPAC needs to ensure that *CI* continues to meet the ever-changing needs and expectations of its readers, especially the younger generation of researchers who prefer digital information and mobile platforms. To that end CPCDS is currently analyzing the results of a *CI* user survey that they conducted earlier this year in order to develop recommendations regarding the future content, format, and mode of presentation of *CI* (see page 3 for details)

- The evaluation of a proposal from De Gruyter for the creation of a new database generated from IUPAC's Standards and Recommendations. CPCDS recommended that the proposal be accepted pending the completion of a satisfactory business plan. The latter was agreed upon earlier this year and CPCDS is actively involved in the development of the database. Product launch is expected in the first quarter of 2016 (see page 4 for details).

- The development of a vision for a new IUPAC website. A Task Force was established in early 2014 and over that summer the group conducted a survey of IUPAC members in order to learn why and how the current website is used and what features and functionalities are absolutely necessary for the provision of an efficient, smooth, and pleasant user experience. The Task Force recommendations were submitted to the IUPAC Executive Committee in November 2014 to help provide direction for the new site that is currently in development under the direction of the IUPAC Secretariat. A beta version will be available during the General Assembly in Busan, Korea in order to gather additional input (see page 5 for details).

- The drafting of new Terms of Reference for the committee. This was driven by that fact that both the committee's name and scope of activities were revised at the 2013 IUPAC meeting in Istanbul (the former name was the Committee on Print and Electronic

Publications (CPEP)). The new Terms of Reference will be presented for Council approval at the 2015 Council meeting in Busan, Korea (see page 9).

Additional details on the above highlights can be found on the following pages as noted. Committee and Task Force members are listed beginning on page 9 at the end of this report. They all deserve much thanks for the work that they have done over the past eighteen months.

Full Report

CPCDS supports all of the IUPAC Strategic Goals, either directly or tangently. However, *all* of the activities discussed in this report are primarily related to Goals #2, #4 and #5 - dealing with issues of tools for communication (publications), standardization (IUPAC database on Standards), and the enhancement of chemical education (publications, databases), and the public appreciation of science (new web site). These strategic goals are as follows:

#2. IUPAC will facilitate the advancement of research in the chemical sciences through the tools it provides for international standardization and scientific discussion.

 # 4. IUPAC will foster communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing nations.

#5. IUPAC will utilize its global perspective and network to contribute to the enhancement of chemistry education, the career development if young chemical scientists, and the public appreciation of chemistry

Transition of IUPAC Publications to De Gruyter

Pure and Applied Chemistry

The transition of *Pure and Applied Chemistry* (*PAC*) to the De Gruyter publication system began in 2013 in preparation for the first issue of 2014. In general terms the transition went smoothly and the first *PAC* issue was published on time. However, there were challenges, most of which have been resolved, including those related to conference issues and the workflow needed to ensure that that the related papers appear in the same issue. The De Gruyter platform currently does not allow for a forward linking ("cited by") feature. However, this feature will be added in August 2015 in the platform upgrade. The CrossMark functionality will not be added in 2015 and a date has not been provided for when this feature will be included on the platform. (Note: CrossMark is a service that gives scholars the information they need to verify that they are using the most recent and reliable versions of a document. Readers click on the CrossMark logos on PDF or HTML documents, and a status box tells them if the document is current or if updates are available).

De Gruyter has hired staff member to work in their Boston, MA (USA) office, spending 85% of his time on IUPAC publications. He has years of publishing experience, including eight years with Wiley-Blackwell where he worked with Societies on their publications. He has learned the

PAC process and has established good working relationships with the *PAC* editors. In summary, the current status of the *PAC* transition is that it is complete and production is running smoothly.

Chemistry International

The transition of *Chemistry International* (*CI*) to the De Grutyer publication system also began in 2013. However, two factors contributed to making this transition less smooth than that of *PAC*. The first is that the De Gruyter production system was built to handle the traditional format of a scholarly journal not that of a news magazine with short articles, photos, etc. The second is that De Gruyter assumed that the *CI* contractor working for IUPAC served as a copy editor and when they took over the publication process they replaced the IUPAC contractor with one of their own. However, during the transition period it became quite apparent that the original *CI* contractor had offered a lot more added-value and actually served more as a co-editor than as a copy editor. These two factors resulted in the complete transformation of the *CI* production process. While it is certainly better now than it was a year ago, the process remains less than ideal.

In 2014 De Gruyter proposed a digital format for *CI* similar to one that they use for their digital publication *Public History Weekly* (http://public-history-weekly.oldenbourg-verlag.de). While CPCDS recommended against using the format, the proposal did raise a number of questions regarding *CI* format, content, features/functionalities, etc. It was agreed that IUPAC had insufficient knowledge about how and why users read *CI* and that readers would be surveyed to learn more. The survey was done earlier this year (see below). The business plan for 2016 assumes no changes in format or distribution. Any recommended changes based upon the survey results will be considered for implementation in 2017.

Chemistry International Survey

As a result of the discussions with De Gruyter regarding the format and purpose of *Chemistry International* (*CI*), it was decided that IUPAC needed to learn more about *CI* usage; e.g. how *CI* is accessed, read and used in its current print and digital versions; what content is most valuable; what, if anything, needs to be added or changed; and what features and functionalities are absolutely essential for the provision of an enjoyable and informative reader experience. A user survey was sent earlier this year to just under 2,000 IUPAC *CI* readers (141 or 7% responded) and it was found that:

- 70% of the respondents read some or all of each issue
- 53.57 % read *CI* in the office and 40.71% read it at home
- The most read sections are: Featured articles 77.14%; News 72.86%; IUPAC Projects 67.14%; Updates on units/symbols/terminology, etc. 50.00%; Conference reports 39.29%; and Forthcoming meetings 37.14%
- 70.71% do not believe that additional content was needed
- 80.71% read print only; 6.43% read digital only; and 12.86% read both formats
- The preferred format for reading is: Print 74.29%; Digital 13.57%; and Indifferent 12.14%

- If *CI* were only available in digital format 77.86% would read it; 22.14% said that they would not
- The preferred format for reading online articles is PDF 63.57% and HTML 22.14%
- The methodology used to access online content is: Computer browser (HTML-5) 77.14%; Computer (print out a PDF to read) 62.14%; Tablet 33.57%; Smartphone 30.00%; and other 4.29%
- 55.71% read other news magazines focused on the global chemistry community (e.g. *Chemical and Engineering News*, *Chemistry World*, etc.)
- 69.29% have no objection to having advertising in *CI*; 10.71% do object; and 20% had no opinion
- 79% of the respondents were age 46 or older; 10% were age 35 or younger

In addition to the above, survey respondents commented on possible content changes, new features, etc. The IUPAC Executive Committee has asked CPCDS to review the survey results with the objective of developing recommendations on the following issues: the need for any follow-up survey work; the future of *CI* (2017 and beyond) in terms of content, format, and mode of presentation; what *CI* content should be on IUPAC.org and what might available and sold in the public domain; how the IUPAC web site can be used to engage members and others with *CI*; and how *CI* can be used to engage members and others with IUPAC. The analysis is currently underway with the objective of having recommendations by the end of 2015.

IUPAC Database on Standards and Recommendations

When De Gruyter assumed the publishing role for *Pure and Applied Chemistry* (*PAC*) they were given contractual rights to sell the *PAC* back files as an avenue for generating additional revenue. However, IUPAC allows that material to be accessed via open access. After much discussion on this issue, De Gruyter put forth a proposal in September 2014 to create a database derived from the IUPAC Standards and Recommendations that are published in *PAC*. This would be an alternative a new revenue-generating opportunity for both IUPAC and De Gruyter even though the Standard and Recommendations are freely-available through the back file. De Gruyter believes that the database will make it much easier and quicker to locate and use the content, and that users will be willing to pay for this added-value.

Three database options were presented: 1) the first was a core database that would be created by extracting the Standards and Recommendations from the *PAC* content that De Gruyter already has in house. Required actions are the conversion of the PDF files to XML, the "cutting" of some of the articles into appropriate database entries, and the uploading and hosting of the database. By "cutting" the articles it is meant that there is content (e.g. definitions) that can very easily be identified during the PDF conversion to XML for documents that have formats similar to glossaries or encyclopedias. This content would provide added-value to the database. However, this identification and cutting could not be done easily for full-text articles due to the time and subject expertise required. De Gruyter would cover the cost of creating the core database. However, an option for this core database was to create metadata for the full-text articles that could not be cut. IUPAC could do this on its own or share the cost with De Gruyter; 2) the second database option was a more advanced version of the core database that would involve the use of a Content Management System (CMS) so that database entries could be worked on within

the database itself. The CMS and a technical help desk would be supplied and paid for by De Gruyter; and 3) the final database option was an enriched database that would contain additional information that complements the Standards and Recommendations; e.g. InChI codes, links to related databases, etc. This would require the use of a freelancer and the costs would be shared by IUPAC and De Gruyter.

After much discussion, CPCDS recommended that IUPAC start with the basic, core database (not including the enhancement of full-text articles) and retain the right to upgrade the product if warranted by market acceptance. An agreement in principal pending the development of a mutually-satisfactory business plan was reached in December 2014. While discussions on the business plan took place early in 2015, CPCDS worked in parallel with De Grutyer to develop search criteria, system features/functionalities, and the basic database tree structure (the framework for searching). The database production agreement was signed at the end of April 2015 and CPCDS continues to work with De Gruyter as the development work progresses.

It should be noted that IUPAC has given approval "in principle" for the CMS system (second database option) so that De Gruyter can obtain the necessary license. The CMS system will not be used until IUPAC chooses to initiate the next step in which database entries will be directly written or revised by IUPAC or until IUPAC and De Gruyter decide to have a freelancer work directly within the database for writing and revision of entries. IUPAC will not be charged for the CMS. It was approved to facilitate a seamless move to upgrade the database should IUPAC desire to do so.

It is important to note that the database will not include all *PAC* content, only the Standards and Recommendations. Also, the content will be as of the immediate prior year (e.g. the most recent content in the 2016 database will be from 2015). The database will be updated annually with more frequent updates if the scientific content requires it. The launch will be in the first quarter of 2016 and IUPAC will receive a royalty on sales with payments made annually. The Secretariat will have free access to use the database and to monitor its quality.

CPCDS will monitor the success of the database and consider how the database could evolve into the enriched version if deemed appropriate. The vision for this database needs to be IUPAC-driven as only IUPAC knows what content will best complement the existing standards and recommendations. No commitment has been made to move to this level, but if the initiative goes well, CPCDS members did concur that this enriched database should be pursued and with the CMS already approved, IUPAC and De Gruyter can move more easily in that direction.

Web Vision Task Force

In order to have a new or updated website in place for the IUPAC General Assembly in August of 2015, IUPAC President, Mark Cesa, established an *ad hoc* Task Force under CPCDS in early 2014. The charter of the Task Force was to assess the state of the current IUPAC Website and recommend improvements that would bring the site quickly and inexpensively to a state that is satisfactory for IUPAC National Adhering Organizations, volunteers, staff, and the chemical and general publics. Once the Task Force had completed the vision, a second Task Force would be formed with the goal of implementing the necessary changes, within IUPAC's financial means, to bring the site to the recommended standard.

The Task Force first met in April 2014 during the IUPAC Bureau meeting in Coimbra, Portugal. At that time it was agreed that broader input was desirable and to that end an online survey was developed to collect information on why people use the web site, how they use it, with what frequency, what they like, don't like, etc. The ultimate goal is to create an attractive, intuitive "task-oriented" website, so that the user can get in, get what they need, and get-out with a minimum number of click-throughs and distractions.

The Web Vision Survey was distributed on June 30, 2014. It was sent to all Division Presidents for distribution, to a list of active committee and project members, and was posted on the IUPAC Discussion Board. Reminders were sent out in August. The number of responses was far less than desirable (45). While some interesting data was gained that re-enforced individual opinions on the website, it is hoped that additional input is gained as the actual project moves forward, especially during the General Assembly in Busan, Korea, where a beta web site will be used to gather feedback.

The following is a summary of the survey responses:

- 60% of the respondents use the web site often.
- 68% of the usage is with regard to governance activities
- 62.86% use the site to access *Chemistry International (important as the future format/distribution of CI is being considered).*
- 50% regard the speed of downloading as average (11% don't download at all)
- 38.64% want the site updated weekly
- 55% said that content curation needs to be done by both those who create the content and IUPAC staff
- 35% said that the home page is intuitive (29% believe just the opposite - the remainder have no opinion)
- 23.5% think that the web site is easy to navigate (28% believe just the opposite - the remainder have no opinion)
- 10.41% cannot find information easily (24% believe just the opposite - the remainder have no opinion)
- 11.44% do not believe that the web site has all of the IUPAC information that they need (32% believe just the opposite - the remainder have no opinion)
- 12.38% do not believe that the website promotes a positive image of IUPAC (29% believe just the opposite - the remainder have no opinion)
- 13.47% do not believe that the website is effective with the general public (23% believe just the opposite - the remainder have no opinion)

The features given the highest number of top 5 rankings for inclusion in a new website are (in order of priority):

- Ease of Navigation (clear winner)
- Content for the General Public to promote the image of chemistry
- Linking to related sites
- The ability to upload/update and edit
- More content/Group workspace for sharing content (equal rankings)

Other possible features, e.g. social media, mobile access, job postings and a "My IUPAC" personal section shared similar rankings, but all were well below the top five. In the total rankings they remained at the bottom of the list in the following order: mobile access, social media, job postings and My IUPAC.

Most of those who responded to the survey were in governance; 47% were between the ages of 25 and 55; and 18 countries were represented.

The Task Force submitted the following recommendations to the Secretariat and IUPAC Executive Committee in November 2014:

1. Platform Recommendation

That the new IUPAC website be based upon a platform other than the current TYPO3 as that system is neither easy-to-use nor readily supported within the United States. Recognizing its own lack of technical expertise the Task Force did not suggest a specific platform, but recommended that a new platform be selected after an external third-party technical assessment was conducted that looked at 1) the recommended website features and 2) how the new website will need to be integrated with the IUPAC in-house database. It was also recommended that the platform support user-authentication to facilitate member control over the input of their own personal information and that if IUPAC needs to implement the recommended new website features and functionalities in phases, the platform should provide the flexibility to add such features relatively easily and at a reasonable cost.

2. Feature/ Functionality Recommendation

That all of the features be included in the new website. However, if a phase-in is required, only "Job postings" and "My IUPAC" should be relegated to a later phase. The rationale for including social media and mobile access in the first phase is that these features are very closely-tied to promoting a positive, modern image of IUPAC to both the general public and others within the scientific community. In addition, they are essential communication tools for today's young generation of researchers whom IUPAC wishes to attract and retain as members. The Task Force did not recommend a specific structure or site map for the new website, but said that a professional and experienced website designer undertake an unbiased assessment of the desired website features, its usage, and its management requirements with the goal of providing a proposed structure to which IUPAC leadership and this Task Force can react and ultimately revise.

3. General Guidelines

- That the Homepage should be visually attractive and provide prominent search starting points that will facilitate quick access to the most frequently-used IUPAC content with a minimum number of clicks. Site navigation must be quick, easy, and intuitive for both experienced and novice users. The IUPAC Home Page must also appeal to varied audiences. While the primary audience is IUPAC members and others within the scientific community, the secondary audience is the general public, including high school

and college students who may be seeking information on chemistry-related topics. Reaching out to this secondary audience has been identified as a key requirement for the IUPAC website of the future. IUPAC's stated Vision is as follows: "IUPAC advances the worldwide role of chemistry for the benefit of Mankind." The website must demonstrate those benefits and provide access to information that will be of interest to the secondary audience.

- That Project information, the second most sought-after information on the IUPAC website, be highly-visible and searchable on multiple data points (e.g. project number, Division, Committee, members, etc.).

- That the future of IUPAC publications and conferences be considered. These represent the third most sought-after information on the web site. The publications most used on the IUPAC site in the past have been *Pure and Applied Chemistry* (*PAC*) and *Chemistry International* (*CI*). However, while these publications are now being published by De Gruyter and by contract must be accessible only their site, IUPAC should have the option to make them accessible on the IUPAC site in the future 1) if the De Gruyter relationship ends, 2) if IUPAC chooses to host the open access files in order to drive traffic to the site, and/or 3) if IUPAC chooses to again host *CI* as part of the public face of chemistry. Also, *CI*, through May 2013 is currently on the IUPAC site behind a fire wall and not accessible from the outside. This was done with De Gruyter's approval in order to preserve the links from *CI* to other parts of the site (e.g. projects, conferences, etc.) that had been built manually over a decade. This data and the links should be preserved in the new site.

- That Management develop content curation policies to ensure quality and consistency while meeting member needs and expectations. One of the top five requirements of the new website is the ease of uploading, updating, and editing content, but opinions differ on how these efforts should be accomplished; e.g., 23% of survey respondents believe that those who create the content (Divisions, Committees, etc.) should be responsible for data curation; 14% believe that the responsibility lies with IUPAC staff; and 55% believe that the responsibility is a combination of those two efforts in order to maintain uniformity.

- That Management must decide what content will be accessible on the IUPAC website moving forward. Many survey respondents do not believe that the IUPAC website has all of the information that they need. However, the information may be on the website, but buried too deeply to be found or the links are broken, etc.

- That Management decide what existing information can be used to inform non-scientists, including students (high school, undergraduate, other) who may be searching for information on a current issue or of a historical nature (e.g. periodic table), and what additional content, if any, needs to be added over time. Can information from *CI* be deployed here?

- That Management consider if it wants to use the website for either one- or two-way communication with members. The use of social media and the creation of group workspaces have been identified as desired features for the new website. However, there are other possible communication mechanisms such as group e-mails, listservs, etc. that can be used to disseminate surveys, important information, etc. If the website is to serve in a communication role it should be decided upfront. Note that survey respondents want a replacement for the current discussion boards and group workspaces may serve that role as noted earlier.

- That Management decide where and how the new website is hosted. However the Task Force did recommend that IUPAC consider keeping an arms-length relationship with the organization that is selected and not have a member organization host the site as in the past.

- That in seeking proposals for the development of a new web site, other issues to be considered are: search speed; web analytics to identify usage, trends, etc; search engine optimization (SEO) to ensure that the IUPAC site is easily found; and frequency of updating.

It should be noted that the final Task Force report included an excellent and poetic history of the current IUPAC website written by Fabienne Meyers. It has provided significant input into how the new web site should (and should not) be built.

CPCDS Terms of Reference

It was decided in 2013 during the General Assembly held in Istanbul, Turkey that the scope of activities of the IUPAC Committee on Print and Electronic Publications (CPEP) be expanded to cover cheminformatics data standards. This change was approved by the IUPAC Bureau and the committee's name was changed to the IUPAC Committee on Publications and Cheminformatics Data Standards (CPCDS). The Committee drafted new Terms of Reference that were approved by the IUPAC Bureau in November 2014.

The current approved Terms of Reference that were originally developed for to CPEP are as follows:

(i) To advise the President, Executive Committee, other Standing Committees, Divisions, and Commissions on all aspects of the design and implementation of printed and electronic publications, including computerized databases of all sorts, and to promote the compatibility of electronic transmission and storage of information,

(ii) To make recommendations to the President and the Executive Committee on matters of policy and procedures related to the production and dissemination of printed and electronic publications,

(iii) To advise the Secretary General and the Executive Director on hardware and software requirements for the Secretariat and on the development and operation of its computer systems,

(iv) Subject to approval by the President and the Executive Committee, to establish Advisory Boards, Subcommittees, and Working Groups as needed to carry out specific functions of the Committee.

The proposed revision (to section (i) only, changes are bolded).

(i) To advise the President, Executive Committee, other Standing Committees, Divisions, and Commissions on all aspects of the design and implementation **of publications and data-sharing,** including computerized databases of all sorts, and to promote the compatibility of **the** electronic transmission**, storage, and management of digital content through the development of standards for the creation of a consistent and interoperable global framework for human and machine-readable chemical information.**

Changes

On line 2 of the current section (i) the differentiation between print and electronic publications has been removed since the committee believe that this distinction is no longer necessary in today's publishing environment. "Data- sharing" has been included to reflect the current need for this activity in e-science. The wording that has been added following the term "storage on line 3 reflects the approved breadth of the committee's activities as had been suggested at the Istanbul meeting; i.e. to support the development of standards that will support the efficient exchange/communication of content.

Members of the Committee on Publications and Cheminformatics Data Standards (CPCDS 2014-2015

Chair: Bonnie Lawlor (USA)
Secretary: James Liu (USA)

Titular Members:

Jeremy Frey (UK)
Kazuhiro Hayashi (Japan)
Lene Hviid (The Netherlands)
Wolfram Koch (Germany)
Robert Lancashire (Jamaica)
Bono Lučić (Croatia)
Miloslav Nic (Czech Republic)
Leah McEwen (USA)

Associate Members:

Mark Kinnan (USA)

Ex Officio Members:

Hugh Burrows (Portugal)

Web Vision Task Force Members

Christopher Brett (Portugal)
Mei-Hung Chiu (China)
Karl-Heinz Hellwich (Germany)
Fabienne Meyers (USA – IUPAC Associate Director)
Tom Perun (USA)

Ex Officio:

Brynn Hibbert (Australia)
Roberto Marquardt (France)

IUPAC Database Task Force

CPCDS Members (see above)
Steve Bachrach (USA)
Brynn Hibbert (Australia)
Colin Humphris, IUPAC Acting Secretary General
Dave Martinsen (USA)
Fabienne Meyers, IUPAC Associate Director
Lynn Soby, IUPAC Executive Director
Ron Weir (Canada)

Publications Transition Task Force

CPCDS Members (see above)
Steve Bachrach (USA)
Javier Garcia-Martinez (Spain)
Colin Humphris, (UK - IUPAC Acting Secretary General)
Dave Martinsen (USA)
Fabienne Meyers, (USA - IUPAC Associate Director)
Lynn Soby, (USA - IUPAC Executive Director)
Ron Weir (Canada)

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IUPAC Committee on Chemical Research Applied to World Needs (ChemRAWN)

Report for 2014-2015 to Council

Busan, Korea 13 August 2015

In this biennium the committee has a) worked hard, but in vain to realize two planned conferences; b) continued the development of several conference ideas; c) administered the process for the ChemRAWN VII Prize for Atmospheric and Green Chemistry; d) been engaged in events being organized after the Organization for the Prohibition of Chemical Weapons (OPCW) was awarded the 2013 Nobel Peace Prize. Overall, the results are mixed: Several conferences were cancelled for various reasons, whereas other ideas for future conferences have matured and two of them are ready to be executed. A serious fact is that funding of the conferences has become so difficult that people have become clearly more reluctant to become properly involved in implementation of the committee's output.

1. Committee meetings and membership

Since the previous General Assembly in Istanbul, Turkey, in 2013 the committee has met once, in Bled, Slovenia in June 2014. In addition issues have been discussed by e-mail communication and this has moved several issues forward at an efficient speed.

The membership of the committee for this biennium is the following:

Committee chair:	Leiv K. Sydnes, Norway	
Committee Secretary:	Gary vanLoon, Canada	
The titular members:	Richard A. Durst, USA Venceslav Kaucic, Slovenia Ting-Kueh Soon, Malaysia	Nadia G. Kandile, Egypt Jean-Marc Paris, France Carlos Tollinche, Puerto Rico
The associate members:	Vincenza Faraco, Italy Ekaterina Lokteva, Russia Brindaban C. Ranu, India	Fernando Galembeck, Brazil M. Mossihizzaman, Bangladesh Kazuhiko Shimura, Japan
Narional representatives:	Amal Al-Aboudi, Jordan Xinhe Bao, China/Beijing V. C. Garonchuk, Ukraine Zafra Lerman, Israel Ramanee D. Wijesekera, Sri Lanka	Rameshwar Adhiari, Nepal Oleg M. Demchuk, Poland Kew-Ho Lee, Korea Prince J.O. Oghifo, Nigeria
Ex Officio (The treasurer):	John Corish, Ireland	

2. Conferences

Cancelled or postponed plans

Four ideas/proposals belong to this category; one proposal has been cancelled, one conference has been moved from last year to this year whereas another has been put on hold, one proposal has been brought back to the committee for further discussions

1) The plan for a conference with the working title “Emerging environmental challenges” has been cancelled. The reason was that work has been going on since 2009 without progress of any significance in the programme development and fundraising. The plan was to focus the conference topics on the results of discussions within the Strategic Approach to International Chemicals Management (SAICM) framework, the outcome of the Rio+20 meeting in June 2012, and the priorities from the International Conference on Chemicals Managemen (ICCM3) held in Nairobi, Kenya, in November 2012, with special emphasis on African issues.
2) At its meeting in Istanbul the committee approved the plans for *ChemRAWN XX Herbal Medicine for Health Care in the 21st Century*, scheduled to be held in Dhaka, Bangladesh, in November 2014. However, due to a combination of a slow approval process and lack of funding the organizers were forced to postpone the meeting until November of this year (see below).
3) The committee has for some time been working with plans for a new conference on water purification and water quality. ChemRAWN XV, held in 2004 in Paris, France, was devoted to the same overall topic, but the water problems are indeed regional and that merits a new conference. The idea was (and is) to focus in particular on the water situation in The Middle East, which is unique and difficult as documented through several projects including one funded by IUPAC (project # 2008-003-3-600; see CI 2014, 36 (3), 5-8). A task group has been working with the proposal, under the chairship of Nadia Kandil from Egypt, and the original plan was to have the conference late this year. Due to funding problems and difficulties in finding a conference venue in The Middle East, the conference has been put to a hold, but the task group is committed to the cause.
4) A meeting with the working title “Medical diagnostic technologies for resource-limited countries” reached the final planning stage at the end of 2013 under the enthusiastic leadership of the task-group chair Richard Durst, USA. Unfortunately, when the venue and the time had been picked and the AIS form was ready to be sent to the Secretariat the chair had to step down. Since nobody was prepared to take over on a short notice, it was decided to bring the plan back to the committee for further discussions with the aim of holding a ChemRAWN conference in the not too distant future.

Upcoming conferences

Currently two conferences are scheduled.

The first is *ChemRAWN XX Conference on Herbal Medicine for Health Care in the 21st Century*, which is announced on the ChemRAWN homepage, will be held in Dhaka, Bangladesh, 6-9 November this year with Mohammad Mossihuzzaman as Chair. The principal aims are to provide a global perspective on the future developments of the many chemical, biological, botanical, and legal facets of herbal (traditional) medicine, as they relate to the accessibility of quality, safe,

efficacious and consistent herbal medicines for the improvement of healthcare globally. One of the hottest topics in the field of natural products development in health care is access to quality, safe, effective, and sustainable medicines. This has been highlighted by WHO since 2000, and an IUPAC technical bulletin was published in this area (2008). Analytical and natural product chemistry, including metabolomics, will be significantly represented, as well as chemical and biological information systems development, new technologies, efficacy-focused clinical trials, agroeconomic and sustainable development, intellectual property rights and patents, production, marketing, and synergistic integration with evolving government regulations. In each of these areas, chemistry is one of the elements to success internationally. Cutting edge applications involving integrated areas of chromatographic and spectroscopic analysis using a variety of IR, Raman, NIR, NMR, and mass spectral techniques are being used internationally to address quality control needs. Network pharmacology is beginning to explain the multiple targeting of traditional medicines, and the globalization of traditional medicines and phytotherapeuticals is dramatically impacting the chemical sciences. This will be the first IUPAC conference to bring all these aspects together with a focus on the integrated contributions that chemistry can make at the international level to improve health care. A Future Actions Committee (FAC) will be working during the conference to develop plans for future activities.

The second is *ChemRAWN XXI Conference on Urban Solid Waste Management,* which will be held in Rome, Italy, 6-8 April 2016 with Mario Malinconico as Chair. The aim of the conference is to present a comprehensive perspective on the current challenges of solid urban waste management and new directions for their exploitation, especially through a from-waste-to-resource approach. The Conference will bring together experts from the urbanized world, as well as experts from developing countries, giving an opportunity not only to scientists from many disciplines, but also to other organizations, policy makers and groups involved in control and certification, to meet together and discuss future trends and action required. Huge amounts of wastes are yearly produced all around the world. The amount of Solid Urban Waste, one of the most important by-products of an urban lifestyle, is growing even faster than the rate of urbanization. Poorly collected or improperly disposed waste and lack of enforced regulations, mainly in low- and middle-income countries, can have a detrimental impact on the environment due to contamination of groundwater and surface water by leachate, as well as air pollution from burning of There will be four main outcomes from the conference: i) A raising of global awareness concerning the issues which every country in the world faces with respect to waste management. ii) A raising of global awareness concerning the best practices to be adopted. iii) A consensus that scientists within countries, within regions, and across the world must cooperate and collaborate to improve waste management systems. A less tangible, yet real, outcome will be the networking connections that will occur among and between scientists, producers, and regulators which will foster understanding and collaboration in the future. In accordance with ChemRAWN conference concept a Future Actions Committee (FAC) will be working during the conference to develop plans for future activities.

Development of new conferences

The only way ChemRAWN can survive and be relevant in a global perspective is to maintain a healthy flow of ideas that are vividly discussed. Such discussions always constitute the main activity when the committee meets. Topics currently under discussion include the following list (not exhaustive):

1) Reducing carbon footprints
2) Nanomaterials and health
3) A modular approach to teaching chemistry at various levels (initiative from IOCD)
4) Food additives and supplements
5) Green catalysis
6) Materials for more efficient energy production
7) The fate of anthropogenic chemicals in the environment
8) Recycling of plastics

The discussion of the proposal of a ChemRAWN conference on Green Catalysis has been the most far-reaching and Brindaban Ranu, India, is prepared to Chair a task group for a conference on “Application of Green Catalysis to reduce Industrial Waste” (working title).

3. ChemRAWN VII Prize for Atmospheric and Green Chemistry

The prize, which is awarded to a young investigator (younger than 45 years) from a developing country who is actively contributing to research in green chemistry and/or atmospheric chemistry, and which was established from the profit made by ChemRAWN VII, comprises of a plaque and a cash award of USD 5,000 and was handed out for the first time in 2010. The prize for 2014 was announced in November 2013 in CI and the deadline for submissions was 22 March 2014. The winner of the 2014 prize was Professor Vânia Gomes Zuin from Federal University of São Carlos in São Carlos, Brazil. Dr. Zuin received the award in recognition of her significant contributions in developing green analytical methodologies used to analyze bioactive high-value organic substances extracted from agro-industrial residues. In this field she has been involved in developing new analytical methods based on sorbents derived from renewable sources, methodologies which have appeared to be useful to analyze natural products such as flavonoids and alkaloids as well as to optimize processes to make them greener. She has also made important contributions in the development of curricula for courses in environmental development and green chemistry, the latter also through the IUPAC project “Green Chemistry in Higher Education: Toward a Green Chemistry Curriculum for Latin American and African Universities”. In the best academic traditions she has a number of publications to her credit in Brazilian as well as international journals and books.

The number of nominees was significantly lower this time than for the 2012 prize. An adjustment of guidelines for the prize is therefore under discussion.

4. Cooperation with OPCW

The close cooperation that has developed between IUPAC and the Organization for the Prohibition of Chemical Weapons led to a number of engagements in this biennium as well. The basis for all these requests can be connected to the Chair's involvement in the three workshops run by IUPAC (to address advances in chemistry and chemical technology that could potentially be misused for weapons development and terrorist purposes) in preparation of the review of the Chemical Weapons Convention in 2003, 2008 and 2013, which are relevant examples of application of chemical knowledge in the service of Mankind. The fact that OPCW was awarded the 2013 Peace Prize for 2013 increased the number of requests significantly. This is reflected in the listing of written contributions and oral presentations at the end of this report.

5. Running and funding of ChemRAWN conferences

ChemRAWN conferences are special meetings because the chemical challenges are primarily discussed in for scientific purposes, but in a societal context, often with technical solutions as a desirable outcome. Consequently, these conferences are much more multidisciplinary than almost all other meetings organized under the IUPAC umbrella. As a result the participants constitute a mixed crowd. ChemRAWN conferences are therefor rather demanding to plan and run, and relatively difficult to fund.

As a help for organizers of ChemRAWN meetings four documents describing the roles and responsibilities at different stages were worked out at the beginning of this biennium and posted on the committee's site at www.iupac.org.

What is missing, however, is a collection of good advice for fundraisers. Due to their multi-disciplinary nature ChemRAWN conferences have appeared to be more difficult to fund from traditional sources than other meetings. When this comes in addition to the IUPAC funding policy, which in essence makes it impossible for ChemRAWN to get financial support to its conferences, the matching-fund principle cannot be applied either. That has indeed killed at least one conference and postponed another one this biennium, and as funding sources become scarcer worldwide the prediction is that the situation will worsen in the coming years and become a major challenge not only for the ChemRAWN committee, but also for IUPAC (see section 8)

6. Outreach through the web

At its meeting in Istanbul in 2014 the committee appointed a sub-committee with the task to improve the ChemRAWN site at the IUPAC homepage. The sub-committee was chaired by the secretary, Gary vanLoon. Despite dedicated work and several good initiatives from the sub-committee insignificant impact can be traced.

7. Support for the Six IUPAC Goals

The work the ChemRAWN committee does is in essence to bring chemistry into action in the civil society in a way that benefits the people. The most urgent needs are in countries in transition, but the perspective is really global. All ChemRAWN activities are therefore aiming at fulfilling the IUPAC vision statement. With regard to the strategic goals the following comments are relevant:

Address global issues

Each ChemRAWN conference focuses on a major issue of global concern, and all the committee's activities are therefore really addressing global issues.

Advance research through scientific discussion

The findings and recommendations arising from each conference usually include instances where advances in research have made significant contributions. By focusing on world needs the committee's work certainly contributes to draw the research communities' attention to areas where more research is needed to societal problems.

Assist industry toward sustainable development, wealth creation, and improvement of the quality of life

Starting with ChemRAWN I: *Future Sources of Organic Raw Materials*, ChemRAWN conferences on advanced materials, ocean resources, health, atmosphere, sustainable development, greener manufacturing processes, innovation in industry, and chemistry and water have all focused on the needs of industry and have been attended or anticipated to be attended and supported by major chemical firms. This practise will be continued at both *ChemRAWN XX Conference on Herbal Medicine for Health Care in the 21st Century* and *ChemRAWN XXI Conference on Urban Solid Waste Management*.

Foster communication among chemists and organizations with special emphasis on needs in developing countries.

Virtually all ChemRAWN conferences have emphasized issues of major import to the developing world. That is also the case with the two next meetings, one of which, ChemRAWN XX, will take place in Dhaka, Bangladesh.

Enhance education and the appreciation of chemistry globally

Education and sound development walk hand in hand, and it has therefore been a priority for the committee to develop a significant ChemRAWN conference on education. In order to achieve this the committee has established contact with the International Organization for Chemical Sciences in Development (IOCD), with which we work to try to develop a conference on modular approach to teaching chemistry at various level.

Increase the diversity in IUPAC bodies.

The ChemRAWN Committee works continually to include underrepresented minorities in its membership and also to organize its conferences with diverse partners worldwide.

7. Written and oral presentations

The following articles related to the committee's work have been published:

Leiv K. Sydnes, ”IUPAC and the Chemical Weapons Convention”, *Kjemi* **2014** (2) 16-19.

Leiv K. Sydnes, “Vania G. Zuin is awarded the ChemRAWN VII Prize for Atmospheric and Green Chemistry”, *Chemistry International* **2014**, *36 (6)*, 16-17.

Leiv K. Sydnes, “IUPAC, OPCW, and the Chemical Weapons Convention”, *Chemistry International* **2013**, *35* (4), 4-8

The following lectures related to the committee’s work have been given:

Leiv K. Sydnes, “Serving Mankind through Chemistry”, Namur, Belgium (14.01.14)

Leiv K. Sydnes, “100 years with chemical weapons”, Bergen, Norway (06.03.14)

Leiv K. Sydnes, “IUPAC and the Chemical Weapons Convention”, The Hague, The Netherlands (24.06.14)

Leiv K. Sydnes, “Chemistry in the Service of Mankind”, Kathmandu, Nepal (08.09.14)

Leiv K. Sydnes, “Chemistry – A Core Science to Solve Important Challenges”, Al-Quds University, Palestine (24.02.15)

8. A serious problem

The funding of ChemRAWN conferences has gradually become more and more difficult. A relevant point in this context is that the ChemRAWN committee, unlike the divisions, CCE and COCI, has no money to spend on projects which can be connected with conferences so that the project funding can be regarded as seed money from IUPAC when external funding is sought. This is a serious problem for ChemRAWN, not only financially but also when committee members try to recruit volunteers to task groups and organizing committees. It should therefore be considered to make funds for some project available to the ChemRAWN committee.

Bergen, Norway, 2015.06.26

Leiv K. Sydnes

Chair

ChemRAWN Committee

IUPAC: Committee on Chemistry and Industry

Report to Council – 2015

Bernard West, Chair, COCI

Executive Summary

Highlights of COCI for the 2014-2015 Biennium

Focus activity areas for COCI during the 2014 - 2015 Biennium:

- Industry and IUPAC: Voice of the Customer, assessment and recommendations.
- Safety Training Program.
- Responsible Care.
- Regional Workshop.
- ThalesNano Prize

Activities led by others, were to be contributed to as resources permitted. These highlights of the results during the Biennium are organized below along the themes of the current IUPAC Strategic Plan and more details are contained in the report to council full document.

I ***Company Associates - New Project.***

The first project (Project #2014-018-2-022) of a series is Lead by Bryan Hanley with support from Carolyn Ribes) is using surveys to discover what the various stake holders know about the CA process and interaction with industry. The project group has been analyzing the feedback and will continue to work on getting more information and then explore options for changing the process to better serve the needs of the Companies and IUPAC. Any new process will be in line with the Presidents new Strategic Plan and implementation tactics.

II ***Responsible Care Projects - A book and 4 Workshops for Egypt.***

The Responsible Care Project material has been assembled in to a book and published by IUPAC / DeGruyter. The title is “Responsible Care a Case Study” (1). The book has already been provided to a number of individuals and associations. It is being translated into Arabic and possibly into Russian and French. As a result of the book and the agreement with CRDF/CSP of Washington, Bernard West has been involved in two Responsible Care Workshops for the Egyptian Chemical Industry.

III ***SAICM Beginning a Project Design.***

Anna Makarova, COCI NR from Russia, took the leadership for contact with SAICM by attending a meeting in Switzerland. She is continuing to develop a project, which will be supported by COCI. The first step has been to ask all IUPAC Divisions and Standing Committees for a list of their projects and activities that fit in with the SAICM themes. Based on the feedback, a proposal for discussion with SCAIM will be developed to be taken to a SAICM meeting in December 2015.

This is an important opportunity for IUPAC because it could lead to better links with Industry, ICCA, which is active with SAICM and it could also lead to support from SAICM for new IUPAC/SAICM projects.

IV ***Safety Training Program. New Fellows trained CRDF Global/CSP***

This is a major focus in the COCI activities. Built up and headed until the San Juan meeting by Mark Cesa and now led by Bernard West. It was formally supported by UNESCO until 2012 and has since been supported by the CRDF and the Chemical Security Program, CSP, of Washington.

Carolyn Ribes Secretary of COCI arranged for two Fellows to be trained successfully at DOW Netherlands in February 2013. One was from Kenya the other from Nigeria.

The first STP Fellow to be fully supported through the relationship between IUPAC and the CRDF and CSP was trained in May 2014. An Egyptian chemical engineer, Eng. Noha Elbalky, she was trained at Host Company Woodbridge Group in Toronto Canada for three weeks.

In April 2015 a second CRDF/CSP supported Fellow, Professor Ahmed Youssef from Cairo University was trained at Host Company Bayer CropScience in RTP. Professor Youssef has a particular interest in chemical recycling in Egypt and more widely in North Africa. Laura McConnell of Bayer CropScience and IUPAC Division IV President facilitated the training.

A third CRDF/CSP supported Fellow, Christine Ashaolu, will be trained at Host Company National Silicates, A PQ Company, in Toronto Canada. Christine is Assistant Chief Regulatory Officer, Chemical Evaluation and Research, NAFDAC, Nigeria.

Workshop in Busan.
In Istanbul we had a considerable attendance from the Young Observers, as well as Fellows, and COCI members. This lead to an excellent round-table discussion, which generated many good ideas for enhancing the STP.

The STP Workshop in Busan focuses on laboratory safety as well as industry safety, security and the linkage provided by Responsible Care. In addition, the newly trained Fellows present their experience. Proposals from former Fellows explore the possibilities for setting up regional training for India and South America.

ThalesNano 7.5K Prize Awarded a Second Time in 2014.
The prize of $ 7500 shall be awarded to an internationally recognized scientist (preferably chemist) whose activities or published accounts have made an outstanding contribution to the practice of flow chemistry. ThalesNano also covers the travel expenses of the awardee up to $2500.

The second award was presented in June 2014 during the Flow Chemistry session at the Imret 13 conference by Michael Droescher for COCI and Dr. Ferenc Darvas for ThalesNano and for the Flow Chemical Society.

The third award will be given during the IMRET 14 Conference in Beijing in September 2016.

The call for nominations will go out in September 2015, with a closing date of 31 January 2016.

V Cross Division/Standing Committee support to their initiatives.
COCI continues to work closely with CCE to provide industrial perspectives in the public appreciation of chemistry.

Bernard West presented a summary of the COCI activities at the CCE meeting and conference in Toronto in the summer of 2014.

COCI has assisted the co-chairs of the Busan WCLM organizing committee in the development of the plans for the meetings.

COCI has also contributed financially to a number of new projects shown in the appendix.

VI Challenges continue finding new members with diverse backgrounds & time to be active.
The program of **Division Representatives** to COCI is continuing but needs to be improved for the next Biennium. COCI continues to work toward increased diversity in its membership. However, as stated at the beginning of this report, we now face a rebuilding of the committee.

IUPAC: Committee on Chemistry and Industry

Report to Council – 2015

Bernard West, Chair, COCI

Introduction

The Committee on Chemistry and Industry (COCI) is a focal point in IUPAC for issues of importance to the chemistry-related industries. COCI organizes its activities into five Program Areas and interacts with each of the IUPAC Divisions and Standing Committees.

The principal objectives of COCI as set forth in its Terms of Reference are to:

- Advise the President and Executive Committee on options and actions by which IUPAC could become more attractive in order to increase participation by scientists from industry;
- Develop and maintain an active program to recruit, guide and inform Company Associates;
- Develop liaisons with national and international associations that represent chemical industries, chemical societies, and international bodies involved in scientific and industrial development;
- Initiate and maintain a portfolio of projects with implications for industry.

COCI places strategic emphasis on projects, which share best practices globally and focus on:

- Capacity building
- Public appreciation of chemistry
- The authoritative role of IUPAC as an NGO
  Reputation and trust
- Enabling public and political debates

COCI has focused its activities in five main areas over the past decade.

1. Health, Safety and Environment
2. NAO/Company Associates Recruitment and Retention
3. NGO/IGO/Trade Association
4. Public Appreciation of Chemistry
5. Division and Standing Committee Collaborations

During the 2014-2015 Biennium, COCI selected the first three program areas as priorities. This was due to the high level of turnover in the Committee and we had to be realistic about what we could accomplish with new people. Other activities, led by others, were also contributed to as resources permitted. In particular, COCI focused its attention in 2014-2015 on:

- **Industry and IUPAC: Voice Of the Customer, assessment, recommendations.**
- **Safety Training Program**
- **Responsible Care**
- **Thales/Nano prize in Flow Chemistry**

Summary of Activities

A summary follows of the activities in 2013 leading to the activities accomplished during 2014 and 2015, organized with reference to the IUPAC strategic goals.

I ***IUPAC will provide leadership as a worldwide scientific organization that objectively addresses global issues involving the chemical sciences.***

1. **Regional workshops** were created to strengthen IUPAC/COCI ties with industry in specific regions of the world. The topics were shaped based on the scientific and technical focus of the industrial participants. This series was put on hold, due to lack of support in the geographic areas not yet covered. Once stronger ties are established, COCI intends to resume this series of workshops. The following is a summary of four the Regional Workshops that were held prior to this biennium.

The series started with the European Regional Workshop entitled, "Chemistry in a Changing World – New Perspectives Concerning the IUPAC Family," (Project No. 2006-030-1, see CI, 30 (5), 2008) on 25 April 2008 in Marl, Germany, followed by the second COCI Workshop held on 7 April 2009 on "Chemical Industries & IUPAC in East Asia" (Project No. 2008-038-1, see CI, 32 (2), 2010) at Kanagawa Science Park (KSP) Hotel in Kawasaki, Kanagawa, Japan, and a panel discussion on "Activities and Research Development in Kuwait Industry" in Kuwait on 9 March 2010.The fourth workshop was held in Toronto on June 1st, 2012, which Bernard West organized and which focused on the Great Lakes Area in the US and Canada. The theme was the "Chemistry of Sustainable Supply Chains. A mini workshop, focused on the Middle East, had been planned for Istanbul, August 2013, but was postponed due to speaker scheduling difficulties.

COCI plans to continue to develop a Workshop during the 2016-2017 Biennium in a location to be determined.

2. **Recruitment and retention of Company Associates** is of great concern to COCI and we do not have a solution, yet.

This issue is of high importance to the IUPAC Executive. COCI took this on as a high priority for the Biennium and brought forward the first of a series of Projects to assist in the development of a more robust process for redefining the Company Associates program and links with Industry.

In recent years the offer of a free CA membership for a year to sponsors of any IUPAC related congress or workshop has been successful in identifying new CA's, but it has not been successful in keeping them.

The first project (Project #2014-018-2-022) of a series, Lead by Bryan Hanley with support from Carolyn Ribes), is using surveys to discover what the various stake holders know and think about the CA process and interaction with industry. Over fifty responses were obtained from members of IUPAC Divisions and Committees. The questions explored the benefits and challenges of IUPAC-industry interactions. The project group has been analyzing the feedback and will share a summary of the findings. The group will continue to work on getting more information and will explore options for changing the process to better serve the needs of the Companies and IUPAC. Any new process will be aligned with the new IUAPC Strategic Plan and implementation tactics.

II ***IUPAC will facilitate the advancement of research in the chemical sciences through the tools that it provides for international standardization and scientific discussion.***

Responsible Care Project and Text Book

The first Responsible Care project titled "Responsible Application of Chemistry: An Introduction to

Responsible Care" was completed at the end of 2010. The overall goal of the project was to produce documents that could be used as "teaching aids" or "mentoring aids". The focus was to recognize the importance of Responsible Care in the development of best practices in the developed and developing world. The project (No. 2006-047-1-022, led by Bernard West) was brought to practice with a well-received prototype workshop at McMaster University, where teaching tools for the use of the case studies were tested with a group of Masters students. A second project (2011-020-1-022, again led by Bernard West), The selected story is about Sulco, a Canada colours and chemicals company.

The Responsible Care Project material has been assembled in to a book and published by IUPAC / DeGruyter. The title is "Responsible Care - A Case Study" (1). COCI purchased 100 copies, some to be freely distributed and some to be sold [price is 49 Euros]. All remaining copies are located in Toronto, Canada.

2014-2015 activities: The book has already been provided to a number of individuals and associations. It is being translated into Arabic and possibly into Russian and French. As a result of the book and the agreement with CRDF/CSP of Washington. Bernard West has been involved in two Responsible Care Workshops for the Egyptian Chemical Industry (3,4,5,6) in 2013 and 2014 and also a Green Chemistry Seminar in Moscow in 2014.

The Safety Training Workshop in Busan covers both safety and Responsible Care. Further case work and workshop activity will be pursued into the next Biennium.

III ***IUPAC will assist chemistry-related industry in its contribution to sustainable development, wealth creation, and improvement in the quality of life.***

The Strategic Approach to International Chemicals Management [SAICM], an initiative of the UN implemented through UNEP and WHO, is a policy framework to foster the sound management of chemicals (www.saicm.org.) IUPAC is a registered NGO with SAICM. In late 2014 Anna Makarova, COCI NR from Russia, took the leadership for contact with SAICM by attending a meeting in Switzerland. She is continuing to develop a project, which will be supported by COCI. The first step has been to ask all IUPAC Divisions and Standing Committees for a list of their projects and activities that fit in with the SAICM themes. Based on the feedback, a proposal for discussion with SCAIM will be developed to be taken to a SAICM meeting in December 2015. This is an important opportunity for IUPAC because it could lead to better links with Industry, ICCA, which is active with SAICM and it could also lead to support from SAICM for new IUPAC/SAICM projects.

IUPAC has identified SAICM as an important initiative. COCI did not have the resources to lead this engagement for IUPAC until Anna Makarova took the initiative.

IV ***IUPAC will foster communication among individual chemists and scientific organizations, with special emphasis on the needs of chemists in developing countries***

Safety Training Program [STP]
This is a major focus in the COCI activities. Built up and headed until the San Juan meeting (2011) by Mark Cesa and now led by Bernard West. It was formally supported by UNESCO until 2012 and has since been supported by the Civilian Research and Development Foundation (CRDF) and the Chemical Security Program (CSP), of Washington.

Chemical Security Program aims to raise awareness and provide assistance to improve chemical safety and particularly security best practices, foster national and regional dialogue on improving chemical safety and security, and promote scientific cooperation among chemical professionals. CRDF Global is an independent non-profit organization that promotes international scientific and technical collaboration through grants, technical resources and training. CRDF Global is an implementer for the Chemical Security Engagement Program.

Due to the activity of STP team member Carolyn Ribes two Fellows were trained successfully at DOW Netherlands in February 2013. One was from Kenya the other from Nigeria.

Eng. Noha Elbalky, an Egyptian chemical engineer, was the first STP Fellow, to be fully supported through the relationship between IUPAC and the CRDF and CSP was trained in May 2014. All of her expenses were paid by CRDF which benefits IUPAC and the Host Company. She was trained at host company Woodbridge Group in Toronto, Canada for three weeks. Eng. Noha works for FEI-ECO in Cairo, and is responsible for auditing small to medium sized chemical companies and recommending improvements.

In April 2015 a second CRDF/CSP supported Fellow, Professor Ahmed Youssef from Cairo University was trained at host company Bayer CropScience in Research Triangle Park, North Carolina, USA. He spent a month in the US visiting various sites and attending a conference on Process Safety. Professor Youssef has a particular interested in chemical recycling in Egypt and more widely in North Africa. Laura McConnell of Bayer CropScience and IUPAC Division IV President facilitated the training.

A third CRDF/CSP supported Fellow, Christine Ashaolu, will be trained at host company National Silicates, A PQ Company, in Toronto Canada in 2015. The timing will depend on getting a visa from the Canadian Government. Christine is Assistant Chief Regulatory Officer, Chemical Evaluation and Research, NAFDAC, Nigeria.

STP Fellows Elbalky, Youssef, and Ashaolu will participate in the Safety Training Program workshop in Busan. They will highlight the impact the training had on them and share the results of changes they have been able to drive in their home institutions and countries.

We do have a short list of accepted trainees waiting for assignments with host companies. Signing up host companies is the biggest constraint to expanding the STP activities, although with the excellent support from CRDF/CSP we have recently found suitable hosts.

The initial 3-year agreement with CRDF terminates in 2015. IUPAC/COCI will apply to extend this agreement for another 3-year period.

A list of the STP Fellows trained since 2000 and their reports is available in the IUPAC Website. [http://www.iupac.org/nc/home/about/members-and-committees/committees/coci/stp-fellows.html?sword_list%5B%5D=program]

We still want to explore how we can regain the sponsorship from UNESCO/UNIDO, since that provides additional credentials when recruiting host companies.

Safety Training Program Workshop
This workshop has been held during the Congress and GA for many years. The workshop held in Istanbul in 2013 was very successful and ran as part of the GA for the first time. It provides the opportunity for STP Fellows to share their experiences in their home countries and to learn from experts in chemical health, safety and environmental protection. Members of COCI use the Workshops to evaluate the effectiveness of the STP by reviewing the accomplishments of the STP fellows in their home countries after their training. In Istanbul, we had a considerable attendance from the Young Observers, as well as Fellows, and COCI members. This lead to an excellent round-table discussion, which generated many good ideas for enhancing the STP. The STP Workshop in Busan focuses on laboratory safety as well as industry safety, security and the linkage provided by Responsible Care. In addition, the newly trained Fellows present their experience. Proposals from former Fellows explore the possibilities for setting up regional training for India and South America.

Chemistry Prize in Flow Chemistry
We are proud to reiterate that together with the Hungarian technology company ThalesNano, the

Industrial Prize has been set up and awarded twice. It is given to acknowledge the key role that flow chemistry plays toward improving chemical processes. Flow chemistry is considered an important step towards a green chemistry.

The prize of $ 7500 shall be awarded to an internationally recognized scientist (preferably chemist) whose activities or published accounts have made an outstanding contribution to the practice of flow chemistry. ThalesNano also covers the travel expenses of the awardee up to $2500. ThalesNano will cover the cost of the prize, five times over a period of ten years.

MIT Professor Klavs F. Jensen (Cambridge, USA) was the first recipient. The award was presented on March 13th 2013 at the Select Biosciences Conference in Munich by chair Michael Droescher and Dr. Ferenc Darvas for ThalesNano and for the Flow Chemical Society.

The second award was presented Professor Steve Ley (Cambridge, UK) in June 2014 during the Flow Chemistry session at the IMRET 13 conference by Michael Droescher for COCI and Dr. Ferenc Darvas for ThalesNano and for the Flow Chemical Society.

The third award will be given during the IMRET 14 Conference in Beijing in September 2016. The call for nominations will go out in September 2015, with a closing date of 31 January 2016.

V ***IUPAC will utilize its global perspective and network to contribute to the enhancement of chemistry education, the career development of young chemical scientists, and the public appreciation of chemistry.***

COCI continues to work closely with CCE to provide industrial perspectives in the public appreciation of chemistry.

Bernard West presented a summary of the COCI activities at the CCE meeting and conference in Toronto in the summer of 2014.

COCI has assisted the co-chairs of the Busan WCLM organizing committee in the development of the plans for the meetings.

COCI has also contributed financially to a number of new projects shown in the appendix.

VI ***IUPAC will broaden its national membership base and will seek the maximum feasible diversity in membership of IUPAC bodies in terms of geography, gender, and age.***

The program of **Division Representatives** to COCI is continuing but needs to be improved for the next Biennium.

COCI continues to work toward increased diversity in its membership. However, as stated at the beginning of this report, we now face a rebuilding of the committee.

References

1. Responsible Care, A Case Study. Peter Topalovic, Gail Krantzberg (Eds), DeGruyter 2014, ISBN 978-3-11-034316-8.
2. "World Chemistry Young Leadership Meeting: Echoes from the 2013 Meeting", Michael Droescher, *Chemistry International*, Volume 36, Issue 1, Pages 24–28, ISSN (Online) 1365-2192 , DOI: 10.1515/ci.2014.36.1.24, January 2014
3. FEI-ECO Responsible Care® Awareness Workshop, Kuala Lumpur, Malaysia, December 9-10, 2013. Supported by CRDFGlobal and CSP.
4. FEI-ECO Responsible Care® Capacity Building Workshop, Kuala Lumpur, Malaysia, December 11-12, 2013. Supported by CRDFGlobal and CSP.
5. FEI-ECO Responsible Care® CEO Kickoff Meeting, Cairo, Egypt, November 18, 2014. Supported by CRDFGlobal and CSP.
6. FEI-ECO Responsible Care® Awareness Workshop for Chemical Managers Cairo, Egypt, November 19-20, 2014. Supported by CRDFGlobal and CSP.

COCI Membership 2014 - 2015

Name	Status	Term	NAO
Dr. Bernard West	TM-Chair	2014-2017	Canada
Dr. Carolyn Ribes	TM-Secretary	2014-2017	USA
Prof. Kan-Nan Chen	TM	2014-2017	China/Taipei
Dr. Veronica Cruz	TM	2014-2017	Puerto Rico
Dr. János Fischer	TM	2011-2015	Hungary
Prof Kazuhiko Ishikiriyama	TM	2014-2017	Japan
Dr. Anthony B Hanley	TM	2014-2017	UK
Dr Igor G Kukushkin	TM	2014-2017	Russia
Dr. Daniel Bernard	AM	2012-2015	France
Dr. Paul Baekelmans	AM	2014-2017	Belgium
Dr. Zaiku Xie	AM	2014-2017	China/Beijing
Dr. Chang-Hyun Choi	AM	2014-2017	Korea
Dr Lene Hviid	AM		
	AM		
Prof. Jaques Desbrieres	NR	2012-2015	France
Mr Nabil Ishmael	NR	2014-2017	Jordan
Dr Robert Audette	NR	2014-2017	Canada
Dr Bo Olsson	NR	2012-2015	Sweden
	NR		
	NR		
	NR		
Prof. John Dymond	Div. I Rep.		UK
Dr. Markku Leskelä	Div. II Rep.		Finland
Prof. Janine Cossy	Div. III Rep.		France
Dr. William Work	Div. IV Rep.		USA
Dr. Zoltan Mester	Div. V Rep.		Canada
Dr. Keiji Tanaka	Div. VI Rep.		Japan
Dr. Tom Perun	Div.VII Rep.		USA
Prof. Gerry Moss	Div. VIII Rep.		UK
Prof. Chiu, Mei-Hung	CCE Rep		Canada
Prof. Leiv Sydnes	CHEMRAWN Rep		Nordic Countries

List of current COCI Projects

2011-053-1-022: Chemical Industry & IUPAC - Workshop 4 in the Great Lakes Area. West
2013-002-2-022: Development and Recognition Programs for Women in Chemistry. Ribes
2013-011-2-022: IUPAC Safety Training Program Workshop Istanbul. West
2013-033-1-022: Chemical Processes for a Sustainable Future. Letcher
2014-018-2-022: Company Associates System Reengineering - Assessment. Hanley
2015-005-1-022: IUPAC Safety Training Program Workshop, Busan, Korea. West

List of COCI supported projects in Divisions & Standing Committees

1. IUPAC'S contribution to achieving the new un sustainable development goals – the focus for the 2015 world chemistry leadership meeting in Busan, Korea (#2015-004-1-020) [Chiu and McConnell]
2. Energy Storage - With Special Reference To Renewable Energy Sources (# 2015-006-1-100) [Letcher]
3. Identifying International Chemical Identifier (Inchi) Enhancements – Qr Codes And Industry Applications (#2015-019-2-800) [Hartshorn]
4. An Introduction to Computational Chemistry and In-silico Visualization. A Workshop for Sub-Saharan Africa Scientists. (# 2015-016-1) (Whitehead)
5. Accelerating Participation and Leadership of Women in Chemistry (#2015-007-1-020) [Wilson and Ribes]

IUPAC

INTERNATIONAL UNION OF
PURE AND APPLIED CHEMISTRY

Committee on Chemistry and Industry

HIGHLIGHT OF 2014-2015

I Company Associates - new project.

II Responsible Care projects - a book and 4 workshops for Egypt.

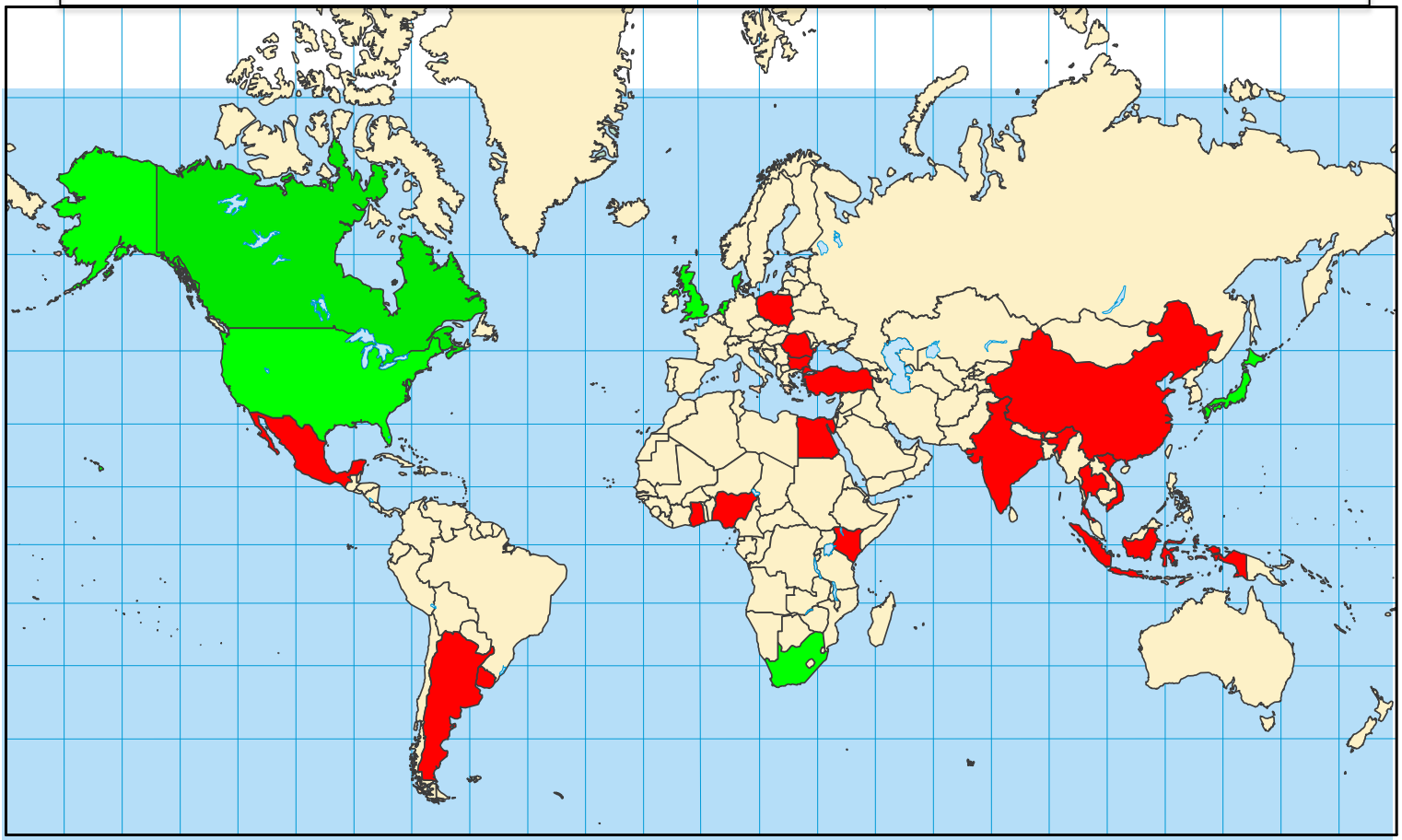
III SAICM beginning a project design.

IV Safety Training Program. New Fellows trained CRDF Global/ CSP
Workshop in Busan.
ThalesNano 7.5K prize Awarded a second time in 2014.

V Cross Division/Standing Committee support to their initiatives.
WCLM, Women in Chemistry,

VI Challenge continues to find new members with diverse backgrounds and who have the time to be active.

Trainees and Host companies



Since 1992

Host Companies

Fellows

Report to Bureau
Committee on Chemistry Education
Mei-Hung Chiu, Chair
July 1, 2015

I. Highlights and/or Executive Summary:

- The 23rd biennial IUPAC International Conference on Chemistry Education (ICCE) was held at the Metro Toronto Convention Centre from 13-18 July, 2014. The theme of the conference was entitled as "*Developing Learning Communities in the Chemical Sciences*". The organizing committee, chaired by Andrew Dicks from Department of Chemistry of University of Toronto, and Judith Poë from Department of Chemical & Physical Sciences, University of Toronto, aims to "investigate how best to forge global links in the chemistry teaching and learning communities and to consider best practices in exploiting technological advances in communications in order to establish innovative learning partnerships". There were about 500 participants received and presented in Toronto. The conference was well attended. The 24th ICCE will be held at Borneo Convention Centre in Kuching, Malaysia from August 15-20, 2016 (Please see www.icce2016.org.my)

- BioLive/ChemEd 2015 conference-Moving forward: Pathways and Partnerships for Biology and Chemistry Learning was held at Victoria University of Wellington in 5-8 July 2015 (See http://www.biolivechemed.nz/). The conference organizer was one of CCE's TMs, Suzanne Bonifa, from Victoria University of Wellington. The goal of the conference is to assist and update teachers in methods of teaching and learning chemistry, with focuses on Process Oriented Guided Inquiry Learning (POGIL), research into practice, molecular mimicry, innovative technology, and teaching and assessment strategies at secondary and tertiary levels. Several plenary speakers are from Australia, UK, USA, and New Zealand. These speakers are benefitial to the New Zealand teaching community, but an especially significant aim is to bring teachers from South Pacific islands such as Cook Islands, Kiribati, Niue, Samoa, Tonga, Tuvalu, and Vanuatu and importantly to serve as a venue to network teachers from these islands with New Zealand teachers for ongoing support. IUPAC and CCE recognize the imporatnce of the conference for promoting chemistry education in emerging countries and provide funds to support their attendance to the conference and three TMs of CCE (Mei-Hung Chiu, Masahiro Kamata, & Mustafa Sözbilir) also sharing their research and practical work via workshops and lectures at the conference during their visit for priority project meeting.

- As one of CCE's affiliated conference, the sixth International Conference of Network for Inter-Asian Chemistry Educators (NICE) is scheduled to be held in Tokyo from July 29 to July 30, 2015. The venue is Miraikan (National Museum of Emerging Science and Innovation) located on Odaiba, which is a large artificial island in Tokyo Bay. Up to July 2, the registered number of participants is 95 including 18 high school students from Taiwan and Korea. The total submissions to the conference are 67. There will be four keynotes, 17 oral presentations, 36 posters, 4 poster-with-demos, 6

workshops to be presented. We anticipate participants from different countries/regions to join the conference.

- On the occasion of the celebration of the 50th anniversary of the African Union, the Federation of African Societies of Chemistry organized the first African Conference on Research in Chemistry Education during December 5th until Saturday December 7th, 2013 at the UNECA conference center in Addis Ababa, Ethiopia. The conference marked an important step for chemistry education in Africa. The second ACRICE 2, African Conference on Research in Chemical Education which will be held at the University of Venda in Thohoyandou (South Africa), 22-27 November 2015. The conference chair, Liliana Mammino, stated that the conference wishes to emphasise the roles of chemical education for development and, in particular, for sustainable development in Africa by offering an ideal opportunity for sharing experiences among specialists across the African continent and with specialists from other continents. All areas and levels of chemical education are considered, and the known major challenges are given specific attention. Explorations of novel approaches and of novel collaborations will be actively encouraged. The conference venue will be at the University of Venda (UNIVEN) that is located in an area rich of natural beauties and cultural heritage, offering excellent opportunities for combining an exciting high-quality scientific experience with a delightful immersion in the warmth of Africa. (Please the official website at https://sites.google.com/site/acrice2015).

- To interact with other divisions of IUPAC, a new project on "the mole" (2013-048-1-100) was approved for Jurgen Stohner. Marcy Towns, a TM of CCE, represented CCE to the Mole Committee (Project 2013-048-1-100) who met with the task group members in Ottawa, January 29-31, 2015 during which there was an extensive discussion of the peer-reviewed literature and analysis of the replies from the IUPAC National Adhering Organizations. At this time the group is creating its technical report. According to the solicitation letter to the NAOs those responding will have the opportunity to comment upon the technical report before it is submitted to Pure and Applied Chemistry. Towns expressed greatly enjoyed the opportunity to work with this outstanding committee. They were very interested in the perspectives and peer-reviewed literature pertaining to how the mole is taught, learned, and understood. Towns strongly encourage the continued engagement of CCE members on committees and projects that have an impact on the chemistry education community.

- With the help from one of our CCE national representatives, Datuk Dr.Ting Kueh Soon (Institut Kemia Malaysia) and former President of the Federation of Asian Chemical Societies), Lida Schoen and Mei-Hung Chiu, as task members of CCE's project on Young Ambassadors for Chemistry (YAC), held workshops for teachers and events for teachers, students, and the public in Bangkok, Thailand and Phnom Penh, Cambodia in November, 2015. During YAC's life time up till now, Dr. Schoen has organised 40 smaller or bigger projects in 29 different countries with Thailand and Cambodia being number 39 and 40. From 2004-2014 14 YAC courses/events were facilitated by 2 CCE project budgets, all 26 smaller or larger courses/events by other organisations (Science Across the World programme, British Council, Life Long Learning projects of the European Union, National Chemistry Associations and

National Science Foundations. The budget for 2004-2007 facilitated 4 YAC's in Taipei - Taiwan, Buenos Aires - Argentina, Krasnoyarsk - Russia and Grahamstown - South Africa, the budget for 2008-2014 facilitated 10 YAC's in San Réduit - Mauritius, Nicosia - Cyprus, Ipoh - Malaysia, Manila - Philippines, Kasulu - Tanzania, Panama City - Panama, Cancun - Mexico, Bangkok - Thailand and Phnom Penh - Cambodia. (See details in Appendix A)

- Peter Mahaffy and Norman Holden, Task Group Co-Chairs, conducted an extension project (IUPAC project #2014-024-1-200) entitled "Development and Global Dissemination of an IUPAC Interactive Electronic Isotopic Periodic Table and Supporting Resources for the Education Community. The first project (2007-038-3200) successfully developed and launched the IPTI during the International Year of Chemistry, suitable for printing as a poster and hanging on chemistry room walls, and received a substantial amount of interest in the education community and also media coverage for IUPAC. In phase 2, they created the Interactive Electronic IUPAC Period Table of the Isotopes and accompany digital learning objects. During the July 2015 May 2016 period, Phase 3, the scientific and educational review of these interactive resources will be carried out, and piloting materials with teachers (Phase 4) will be the focus in 2016, including a planned workshop at the International Conference on Chemistry Education in August, 2016 in Malaysia. The final step will b e to develop strategies for global dissemination (Phase 5), informed by feedback receiv ed from the international audience at the ICCE workshop. (Details could be found in Appendix B)

- CCE collaborates with Div VI on organizing the WCLM for Young Observers as an integral part of IUPAC General Assembly that offers a platform for representatives from National Adhering Organizations (NAOs) to meet and discuss emerging issues of global concerns. The pre-WCLM meeting for the introduction of WCLM to YOs starts on August 10 and a follow-up activity with IUPAC volunteers on developing their ideas into presentations will be held on August 11. The formal WCLM will be conducted from 9AM to 12PM on August 12 during the General Assembly. A flier was (See Appendix C) sent to NAOs to encourage YOs to participate this WCLM. This year WCLM aims to facilitate the specific involvement of YOs in the area of sustainable development goals that UN initiated to address the relevant environmental/social-economic issues and to help YOs understand the contribution that chemistry community can make to the sustainable era.

- The members of International Standards on Chemistry Education Project sponsored by CCE met at International Conference on Chemistry Education (ICCE) in Toronto, Canada, in August 2015 to discuss the analysis of international curriculum standards. The primitive results of the comparisons of standards across countries were reported at Gordon Research Conference held in Maine, USA, in June 2015. The purpose of this project is to identify and specify the chemistry literacy that elementary and secondary school students need to develop during their school years (K-12). The analyses of some topics in the textbooks were also conducted international comparisons purposes. The project is entitled as Design for International Standards for Chemistry Education (ISCE) chaired by Mei-Hung CHIU and task members including Jan Apotheker,

Suzanne Boniface, Michael Droescher, Richard Hartshorn, Masahiro Kamata, Rachel Mamlok-Naaman, Mauro Mocerino, Leontina Lazo Santibañez, Hannah Sevian, Mustafa Sözbilir.

- The CCE priority project members met in Wellington, New Zealand to discuss the priorities of task that CCE will emphasize for the next biennium (2016-2017). The participants included Richard Horshorn (Bureau member), Mustafa Sözbilir (CCE TM), Masahiro Kamata (CCE TM), Suzanne Boneface (CCE TM). The outcomes of the (draft) priorities (See Appendix D) will be discussed at the CCE meetings in Busan in August, 2015.

II. CCE terms of references and strategies to meet these terms of references

(i) To advise the President and the Executive Committee on matters relating to chemistry education, including public appreciation of chemistry.
(ii) To maintain a portfolio of educational projects and to coordinate the educational activities of IUPAC.
(iii) To monitor chemistry education activities throughout the world and to disseminate information relating to chemical education, including public appreciation of chemistry.

CCE accomplishes its role through projects and dedicated efforts of eight titular members, eight associate members representing divisions, 19 national representatives (including a new NR from Nepal), and ex officio members who are representing more than 30 countries.

Our routine tasks include identifying priorities for the biennium, conducting projects and biennial ICCE conferences, reviewing project proposals, and cooperating with IUPAC divisions and standing committees. Also, CCE works and interacts with partners outside of IUPAC, such as OPCW and IOCD. AMs from the IUPAC divisions are also helpful in strengthening our outreach in educational implementation.

III. Membership

Chair
- Chiu, Mei-Hung

Secretary
- Apotheker, Jan

Titular Members
- Aremo, Nina
- Boniface, Suzanne
- Kamata, Masahiro
- Mamlok-Naaman, Rachel
- Sözbilir, Mustafa
- Towns, Marcy

National Representatives
- Al-Najjar, Abdulaziz
- Brandt, Ludo
- Cardellini, Liberato
- Childs, Peter

- Elmgren, Maja
- Mahmood, Farzana
- Maitra, Uday
- Overton, Tina
- Pokrovsky, Alexander
- Rahman, M. Muhibur
- Reiners, Christiane
- Riedel, Miklós
- Shuai, Zhigang
- Solomon, Theodros
- Soon, Ting-Kueh
- Tantayanon, Supawan
- Wright, Anthony (Tony)

Representatives from Divisions

- Chen, Yi (Analytical Chemistry Division Representative)
- Dassenakis, Manos (Chemistry and the Environment Division Representative)
- Duffus, John (Chemistry and Human Health Division Representative)
- García-Martínez, Javier (Inorganic Chemistry Division Representative)
- Garson, Mary (Organic and Biomolecular Chemistry Division Representative)
- Hartshorn, Richard (Chemical Nomenclature and Structure Representation Division Representative)
- Mormann, Werner (Polymer Division Representative)
- Russell, Andrea (Physical and Biophysical Chemistry Division Representative)

New Young Ambassadors for Chemistry (YAC) achievements in Thailand and Cambodia

Lida Schoen
Mei-Hung Chiu

Young Ambassadors for Chemistry projects (2004-2014)

Datuk Dr. Ting Kueh Soon (**I**nstitut **K**emia **M**alaysia) and former President of the **F**ederation of **A**sian **C**hemical **S**ocieties) took the initiative early 2013, in November 2014 all dreams came true in Bangkok and Phnom Penh. We all enjoyed a happy ending of our 2nd series of Young Ambassadors of Chemistry projects.

During YAC's life time up till now we organised 40 smaller or bigger projects in 29 different countries with Thailand and Cambodia being number 39 and 40. From 2004-2014 14 YAC courses/events were facilitated by 2 CCE project budgets, all 26 smaller or larger courses/events by other organisations (Science Across the World programme, British Council, Life Long Learning projects of the European Union, National Chemistry Associations and National Science Foundations). The budget for 2004-2007 facilitated 4 YAC's in Taipei, Taiwan, Buenos Aires, Argentina, Krasnoyarsk, Russia and Grahamstown, South Africa, the budget for 2008-2014 facilitated 10 YAC's in San Réduit, Mauritius, Nicosia, Cyprus, Ipoh, Malaysia, Manila, Philippines, Kasulu, Tanzania, Panama City, Panama, Cancun, Mexico, Bangkok, Thailand and Phnom Penh, Cambodia.

Train the trainers

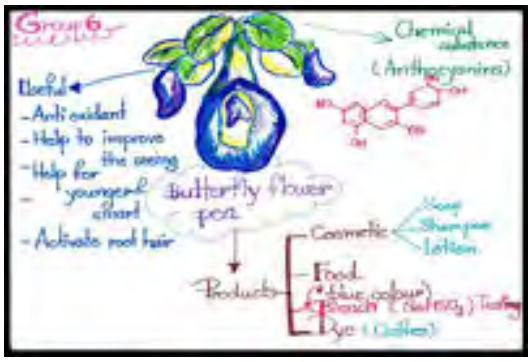
During the course the YAC team aims to train the participating teachers (Thailand: 40, Cambodia: 36) to be able to organise more YAC event with students after the YAC team has left.

01 All officials, organisers and participants in the National Science Museum behind the YAC poster in Bangkok, Thailand

02 All teachers with their certificate of attendance after the YAC event in Phnom Penh, Cambodia

We focus on the chemistry of local daily life products: composition, production (techniques) and applications in relationship to the curriculum. Although we all speak the universal language of chemistry we try to avoid language problems with adapted methodology teachers research the chemistry of a local product in a group of 4 to avoid language problems. They present drawings with their ideas and results.

03 Cambodia: teachers present the results about their chosen product: a local fish.



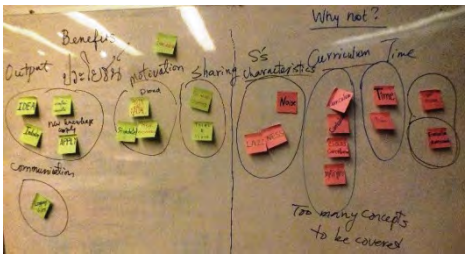
04 Bangkok: result of group work: production, chemistry and applications of the butterfly flower pea

Teachers love this group work, they use their mobile phones to find information and discuss the results in the local language.

Next we discuss how to organise this way of teaching and learning in classrooms with all local 'difficulties': strict curriculum, no time to prepare and not all colleagues willing to change.

05 Teacher trainer Mr. Set Seng helps with group work on the chemistry of daily life products in Phnom Penh.

06 Prof. Boonnak Sukhummek helps us out with the language in Bangkok.



07 Result of the group discussions about teaching the chemistry of daily life products: benefits for students and difficulties in practise.

Augmented reality (AR)

Mei-Hung updates the participants with possibilities of Augmented Reality (AR). Because the number of smartphones and tablets dramatically increases across the world, the school science curriculum should embrace this new innovative technology for scaffolding students' learning of complicated chemistry concepts. In both countries participants are enthusiastic to use the app and to learn about the benefits of new technologies.

Practical work

We pay a lot of attention to the practical work, the teachers have to guide during the event. Teachers (and later the students) have to design, produce and market an innovative local cosmetic line. They start after instruction about pitfalls during the production and theory about suitable raw materials as polymers, detergents, oils, emulsifiers, colours and perfumes. All necessary ingredients, packaging and decoration materials, needed for a TV promotion campaign, are available. Teachers collaborate in groups of 4 and share work.

After 90 minutes hard work groups present their cosmetic lines in a 30 second TV spot. Teachers are a creative species of mankind, that is able to act, dance and sing! Juries have

08 Teachers prepare their innovative Thai cosmetic line and the marketing campaign.

09 Mei-Hung instructs about the perfect Cambodian hair gel.

10 Quality control of this very special new Thai cream

a hard job to decide on winning groups after considering (1) outlook and quality of individual products, (2) cohesion in the line, (3) quality and originality of labels and (4) originality of TV commercials.

We end with reflecting on the expectations of the participants, that they wrote down at the start of the course. All teachers receive a certificate of attendance with the signature of IUPAC's president Mark Cesa.

YAC event

On the last afternoon the trained teachers guide the many students (70 in Bangkok, 50 expected, 120 in Phnom Penh, 50 expected), that love to participate in the YAC event. As roles were divided at the end of the course, all teachers know exactly what to do, resulting in 'stations' for raw materials, colours and perfumes, packaging and stationary.

11 Aerial view of the open space in Chamchuri Square Shopping Mall in Bangkok with part of the participating students and teachers

12 Cambodian students produce their innovative Cambodian cosmetic line and prepare their presentations with 3 TV stations recording them.

In Thailand the venue is an open space on the 1st floor of the Chamchuri Square Shopping Mall. In Cambodia we work in a covered open space in front of the Royal University of Phnom Penh, where soon 3 TV stations are recording the activities of 120 very enthusiastic students and 40 teachers!

All groups start designing and producing their innovative cosmetic lines along the instructions in the local language. Part of the groups act as roving student reporters. They ask the visiting public to fill in a questionnaire about their image of chemistry before and after other students in the group show and tell them about their activities.

13 Example of a new Thai cosmetic line: bath salts, shampoo, hair gel and a cream designed by teachers

14 Beautifully decorated Cambodian products designed by students

In Bangkok our 2 lady speakers, who qualified as the best actors during their own presentations, are doing a great job warming up the audience for things to come.

After the students finish their practical work, including preparing their TV spot with accompanying promotion materials, we start showing the results to the audience. Most groups consist of a number of great actors, so their performances generate great enthusiasm, while the audience cheers them on!

The winning groups get presents from Taiwan and the Netherlands. We don't say goodbye before a group picture with students and teachers is taken. ***The end of glorious Young Ambassadors for Chemistry courses and events in Bangkok and Phnom Penh!***

15 Student presentation in Bangkok: "If you use our new shampoo your hair will get as colourful as mine!"

16 Students acting in a creative TV spot with 2 Cambodian TV stations recording

17 Jury chair Dr. Huy Sieng inspects the products in Phnom Penh.

18 All students with their certificate of attendance and teachers after the YAC event in the Chamchuri Square Shopping Mall in Bangkok

Media coverage

Dow Chemicals Thailand (cosponsor of YAC Thailand) helps to collect clippings of publicity around the 1st YAC Thailand. Between November 24 and December 29, 2014 Prof. Tantayanon receives 17 clippings from 11 different media as publications on paper, blogs and websites with pictures, picture galleries and a few videos, including an interview with Prof. Tantayanon.

YAC results in Taiwan

After YAC Cambodia we travel to Taipei, being in 2004 YAC's place of birth. We visit a junior and a senior high school with teachers, who took part in our first YAC course/event. In both classes we experience dedicated teachers that apply many YAC ideas with their enthusiastic students and the YAC activities become sustainable event in those schools..

19 Junior high school: practical work about phase transitions with melting wax and oil.

20 Senior high school: students collaborate in groups during the production of local products.

Evaluations

Positive public image of chemistry

Our roving student reporters manage to collect many filled in questionnaires from the public: 85 in Thailand and 63 in Cambodia.

The public during the YAC events is most probably not representative for a general public. The image of our public is already quite positive (80% in Thailand, 75% in Cambodia). The reason might be there are mainly relatives or friends of our enthusiastic teachers.

The public in Thailand and Cambodia consider chemistry important in their daily life. They mention preparation and preservation food, vitamins, medicines and drinking water. Main channels of gaining knowledge about chemistry are internet and TV, with occasionally newspapers and radio mentioned. 30% think they would know more about chemistry, if they could have done activities like the students do! The public in both countries highly values the YAC activity, they also often mention the used daily life chemistry related to other subjects, such as art and marketing and the fun they experience after prompting. Guiding people about the role of chemistry in daily life seems to be strengthened in school instruction.

The general opinion is, that the YAC event helps the students understand chemistry, how to use it and relate theory and practice. It shows that chemical substances and products are useful. The presentations of the students' work are appreciated as very creative.

Our question is about the image of chemistry:

Which one of the following pictures shows best what you think about chemistry? Number the pictures in your order of preference, with 1 under the picture that reminds you most of chemistry and a 5 under the picture that reminds you least of chemistry.

Results in Thailand and Cambodia show the same results as shown below the pictures with luckily the picture showing blowing gases or an explosion least prefered.

3 **1** **2** **4** **5**

Fig. 21

It is very positive the participating students in Thailand and Cambodia choose more or less the same order, they only prefer working alone above like in the 3rd picture!

Gap between school chemistry learning and contexturised learning

The students also provide promising feedback to the YAC event. They write down their favourites: new knowledge about products present or useful in daily life and ways to acquire new knowledge. They love to collaborate with so many other students. Last but not least: a lot of fun is often mentioned: '*I want have this event to be continued. Please often organise this event.*'

Feedback from the teachers show the same picture: a lot of new knowledge and new skills learned, so possibilities to teach the students the exciting chemistry related to their daily lives with possibilities e.g. to use local herbs and extract local dyes.

Communication skills enhanced

Many teachers also mention improving their communication and presentation skills and using the internet. The teachers appreciate learning about international science projects, how to join and exchange experiments with students in other countries/cultures: '*Our new skills are not only important to chemistry teachers, but to all students and teachers in other subjects*'.

New (Young) Ambassadors for Chemistry

A few teachers mention to plan to study how to be an ambassador for chemistry with skills to get or share information related to our daily life and how to persuade students with the wrong image to study chemistry.

In Thailand also a few **language teachers** take part. They are positive about course and event too! As teaching and promoting chemistry concerns content and communication, they can be our best ambassadors!

Local organisers

All recommendations to local organisers (and the YAC team) are very clear: longer (than 2 long days) and more courses with more knowledge and ideas for practical work related to students' daily lives with more examples of simple hands-on activities and new ways to teach. A longer course can offer more time to reflect, more time to train the students' activities and more opportunities to practice English with the trainers.

Optional:

Prof. Tantayanon will introduce the (elaborate) Thai report to the national meeting of Chemistry Department Heads and discuss possibilities to organise more YAC events. She will present the results of our evaluations with the present public, the participating students (during the YAC event) and teachers (during the YAC event and the 1.5 day YAC course) to the Chemistry Department Heads at their national meeting. Prof. Tantayanon managed to obtain substantial financial support for course and event from Dow Chemical Thailand.

Dr. Huy Sieng will publish the (elaborate) Cambodian report in CCS' annual bulletin. She is sure the CCS staff will continue to share this knowledge with other teachers in the provinces through the CCS' training programme. She would like IUPAC, CCE to provide Cambodia with more practical work and handouts, with materials and chemical substances. Moreover, she would like IUPAC, CCE to organise more (YAC) events for students, because Cambodia lacks laboratory equipment and chemicals for students' lab work.

Acknowledgements

- IUPAC for facilitating travel expenses of Mei-Hung Chiu and Lida Schoen;

- Barentz Pharma & Cosmetics, the Netherlands for donating the Chinese emulsifier Tinci (Guangzhou Tinci Materials Technology Co., Ltd.(www.tinci.com);
- Sasol Germany for donating the detergent for the shampoo (www.sasolgermany.de);
- Florale Haircare Group for donating professional 'cream' jars (www.floralehaircare.com).

Thailand

- Department of Chemistry, Chulalongkorn University, Bangkok for facilitating and organising the YAC course and event;
- Chemical Society of Thailand (CST) for facilitating the YAC course and renting the venue for the YAC event;
- Dow Chemical Thailand for overall financial support;
- National Science Museum (NSM) for providing the training room;
- Prof. Tantayanon and her staff for perfect organisation, Prof Sairoong Saowsupa for translation and analysis of the questionnaires.

Cambodia

- Royal Academy of Cambodia (RAC) and the Chemical Society of Cambodia (CCS, H.E. Dr. Neth Barom, Chairman of CCS's BOD and BOD members) for facilitating and financing;
- Royal University of Phnom Penh (RUPP) for providing the venue for the YAC event;
- Provincial Department of Education, Youth and Sports, RAC and CCS for financial support;
- Dr. Huy Sieng and CCS's Executive Committee, including Dr. Sotha Chek for organisation and Sotha also for translation and analysis of the questionnaires.

Text

Lida Schoen and Mei-Hung Chiu, with thanks to many helpers for corrections and translating answers from Thai/Khmer on the questionnaires

Pictures

Mei-Hung Chiu, Lida Schoen and Phana Cheng (Cambodia)

July 1, 2015

Update to IUPAC's Committee on Chemistry Education and Division 2 on ***IUPAC Project 2014-024-1-200***, ***Development and Global Dissemination of an IUPAC Interactive Electronic Isotopic Periodic Table and Supporting Resources for the Education Community***

Peter Mahaffy, Task Group Co-Chair
Norman Holden, Task Group Co-Chair

Background and Objectives: The Periodic Table of the Elements, hanging on the wall of classrooms around the world, found on the inside cover of most chemistry textbooks, and widely accessed on the web, has become an icon representing a core activity for IUPAC at the interface between fundamental scientific developments and educational outreach. Yet recent developments in what scientists know about isotopes and atomic weights has the potential to both communicate the power of chemistry at its interfaces, and to create very large pedagogical challenges. To simultaneously address these educational opportunities and challenges, a series of two joint Division II - CCE projects has been created to create, review, and disseminate globally to students and educators the new IUPAC Periodic Table of the Isotopes (IPTI). The first project (2007-038-3-200) successfully developed and launched the IPTI during the International Year of Chemistry, suitable for printing as a poster and hanging on chemistry-room walls, and received a substantial amount of interest in the education community and also media coverage for IUPAC. The present proposal is the second in this series of two planned projects, and it has two objectives:

(a) To realize the intended global reach of the new periodic table, the present project will create an interactive, electronic version of the IPTI that will be disseminated as a free resource to a global audience on a range of platforms and devices, including personal computers and other devices such as tablets and smartphones.

(b) To deliver the IPTI in an interactive electronic form that will encourage users to interact with each element, understand its isotopic composition and variability, and explore applications in everyday life of that element. The interactive electronic IPTI will be accompanied by educational resources and interactive learning objects that will enable users to understand the mass spectrometric and other evidence that leads to our knowledge of the nature of isotopes and the IPTI.

Intended Stakeholders: The primary beneficiaries of the interactive, electronic IUPAC periodic table of the isotopes will be a global audience of educators and students at the secondary and post-secondary level, who will be able to freely and directly access the resources on a wide variety of devices and platforms.

Progress to Date: ***Phase 1 – Consultation***, of the project has been completed, leading to an understanding of the pedagogical challenges faced by teachers and students. Draft learning objectives for the interactive electronic resources have been created and are being used to guide the development of materials.

Phase 2 – Creation of the Interactive Electronic IUPAC Periodic Table of the Isotopes and accompanying digital learning objects is well underway, and on the timeline outlined in the project proposal. The tasks have been divided as follows: Task group Co-Chair Holden has been working with colleagues to finalize the 400+ pages of data and figures for the 118 elements created for the initial project, and it is planned for submission to PAC this month (July). A draft publication describing this phase of the project has been created and reviewed by the project task force. Task group Co-Chair Mahaffy and task group member Brian Martin, working with collaborators at the King's Centre for Visualization in Science, have been overseeing the creation of the template for the core interactive electronic periodic table of the isotopes, and the group is embedding this applet into interactive activities for students. Intended outcomes are for students to appreciate the importance of isotopes in everyday life, the evidential basis for isotopes and atomic weights, and an understanding of why the new IUPAC periodic table has atomic weights for some elements expressed as intervals rather than single numbers.

The starting point for the interactive resources will be to engage students and teachers with the story of Ötzi, the well-preserved 5,300 year old frozen mummy found on a melting glacier in the Ötztal Alps along the Austrian-Italian border. Data about Ötzi's Pb, Sr and O isotopes helped scientists carry out the detective work to determine where he lived. One of the primary research papers outlining how isotopic data about Ötzi is used to gain an understanding of his life, has been adapted to a reading level appropriate for upper level secondary and lower level post-secondary students. After working through the Ötzi example, the interactive resources will introduce students, teachers, and the public to the IUPAC Periodic Table of the Isotopes. There students and teachers will learn that, for some elements like hydrogen, the atomic weight is no longer considered to be a constant of nature, since the ratios of the constituent isotopes can vary in nature. The new interval IUPAC atomic weights complicate life for plug-and-chug calculations for students, but the variable nature of isotopic abundances also presents intriguing opportunities for rich and deep education about fundamental ideas related to atoms, isotopes, and atomic weights. These resources are intended to exploit those learning opportunities.

During the July 2015 – May 2016 period, ***Phase 3, the scientific and educational review*** of these interactive resources will be carried out, and ***piloting materials with teachers (Phase 4)*** will be the focus in 2016, including a planned workshop at the International Conference on Chemistry Education in August, 2016 in Malaysia. The final step will be to develop strategies for ***global dissemination (Phase 5)***, informed by feedback received from the international audience at the ICCE workshop.

WORLD CHEMISTRY LEADERSHIP MEETING

Sponsored by
International Union of Pure and Applied Chemistry
at the
48th IUPAC General Assembly, August 9-14, 2015

www.iupac.org

WCLM Theme:
IUPAC's role in achieving United Nations Sustainable Development Goals

IUPAC serves to advance the worldwide aspects of the chemical sciences and to contribute to the application of chemistry in the service of Mankind.

As part of Rio +20, the UN has identified 17 people-centered goals and associated targets to achieve a sustainable future. (Link to UN SDGs)

The WCLM is an integral part of the IUPAC General Assembly. It offers a platform for representatives from National Adhering Organizations (NAOs) to meet and discuss emerging and pressing issues of global concern.

Pressures of population growth and climate change throughout the world, as well as the opportunities offered by the development of the new era of global interaction have led to the understanding of the need to redefine the role of the scientific and industrial professional communities in addressing and partaking in the debate on sustainable development and offer suitable solutions relevant to all walks of life.

As a result the next WCLM will aim to address the relevant Environmental/ socio-economic issues raised in the UN sustainable development goals and examine the contribution that the Chemistry community can make to realize them in a sustainable way.

This year WCLM aims to facilitate the specific involvement of Young Observers (YOs). It will be an exciting forum for exchange of ideas and views about the way chemistry-based scientists can assist in fulfilling the UN Sustainable Development Goals.

The YOs and invited leaders will have the opportunity to discuss and identify gaps in existing knowledge and practice of chemical science and how to address these goals.

We call on the NAOs to invite YOs to participate in the WCLM programme which will be as follows:

Monday Evening, August 10
Reception for YOs hosted by IUPAC Divisions and Committees to introduce the WCLM activities.

Tuesday Morning, August 11
YO teams will work IUPAC volunteers to develop their ideas into a presentation for the WCLM

Wednesday Morning, August 12
Leader Presentations:

- Surendra Shrestha, UNEP Int'l Environmental Technology Center
- Professor YT Lee, Nobel Laureate, Taiwan
- Representative from European Chemical Industry Council
- Lucilla Spini, Head of Science Programmes, International Council for Science

* **Presentations from YO Teams**

- Group Discussion and identification of highest priority tasks.

Post-GA Activities
Outcomes from the WCLM will be used to drive the actions of a newly formed IUPAC-UN SDG Working Group as a means to develop interdisciplinary projects.

YOs will be encouraged to participate in this working group and in newly formed project teams.

Contact

Fabienne Meyers, Associate Director IUPAC
fabienne@iupac.org

CCE Priorities (draft) for 2016-2017 Biennium

Meeting Date: July 4, 2015

Time: 14:00-16:00

Chair: Mei-Hung Chiu (Chair)

Members: Richard Horshorn (Bureau member), Mustafa Sözbilir (CCE TM), Masahiro Kamata (CCE TM), Suzanne Boneface (CCE TM)

Revised Version of the Priorities for 2014-2015

1. To develop relationships for working collaboratively with groups both inside and outside[1] of IUPAC;
2. To emphasize the importance of developing student-centered learning activities and identifying learning outcomes in chemistry education;
3. To develop quality of teaching practice and development of enthusiasm for teaching in the areas of chemistry and technology education;
4. To continue to support initiatives that raise awareness, social responsibility, and understanding of environmental and ethical issues that are related to chemistry;
5. To initiate programs on promoting chemistry education and public understanding of chemistry for developing countries; and
6. To create resources to support high quality research and practice in chemistry education[2].

Notes:

1. The outside associations includes national and international chemical education organizations as well as education committees from other international scientific unions, e.g. IUPAP, IUBMB, ICSU)
2. Some descriptions about the resources of teaching and learning materials and resourceful persons should be included in the list that could be searched on the website of IUPAC.

Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS)

Biennial Report to the IUPAC Council in Busan, South Korea, July 2013 to July 2015

Executive Summary dated 16 June 2015

During the period July 2013 to July 2015, ICTNS continued its activities on behalf of IUPAC. It has reviewed, edited and approved for publication (28) Recommendations and Technical Reports in Pure and Applied Chemistry (PAC) for a total of (835) journal pages. The activities of ICTNS are summarized in two tables within the Appendix below.

ICTNS completed editing for the completed projects that culminated in six books that include the Blue Book (Nomenclature of Organic Chemistry). All books bear the label of IUPAC. The total pages edited to ensure adherence to IUPAC requirements number 4,801.

The ICTNS continued its consultation and advisory work with several international societies and agencies on which ICTNS has representation that include the BIPM. One important issue dealt with during the reporting period with the BIPM concerned the definition of the mole and ancillary matters. The ICTNS was part of the Task Group examining the definition of the mole and way ahead. In addition, ICTNS provided the on-going resource for the Secretariat in dealing with queries from scientists, engineers, teachers and students on terminology, nomenclature, symbols and units.

Members are reminded of the following motion as Minute 17 passed at the 89th IUPAC Bureau meeting held 17-18 Apr 2010 in Sofia, Bulgaria. http://old.iupac.org/news/archives/2010/bureau_min_sofia_2010.pdf.

17. REAFFIRMATION OF THE ROLE OF ICTNS

The Chairman of ICTNS, Prof. Weir, submitted a Briefing Note to the Secretary General requesting a statement of continuing support from the IUPAC Bureau or Executive Committee that acknowledges the responsibilities of ICTNS to enforce existing IUPAC Recommendations in publications sponsored by IUPAC and to maintain cooperation with international bodies on which IUPAC is represented. The Briefing Note may be found in the Agenda Book.

Prof. Black discussed the historical implications of this matter and introduced the following Motion: *The Bureau reasserts its strong support for the responsibilities of ICTNS to enforce existing IUPAC Recommendations in publications sponsored by IUPAC and to maintain cooperation with international bodies on which IUPAC is represented.* This motion was seconded by several Bureau members and was unanimously passed without discussion.

1. ICTNS Report, July 2013 to July 2015

1.1 Terms of Reference of ICTNS

These include:

(i) To be responsible for submission to the Bureau/Council, in accordance with Bylaw 2.11, for publication or otherwise, any IUPAC document concerned with terminology, nomenclature, symbols and other conventions.

(ii) Before recommending any material for publication as an IUPAC document, to ensure that full consultations have taken place, and the widest possible consensus has been reached among all Divisions and other bodies of the Union, and between IUPAC and other ICSU bodies, the international standardizing organizations, and Conférence Générale des Poids et Mesures (CGPM) and its Committees.

(iii) To ensure, via each Division's Titular Member on ICTNS, that all documents for publication emanating from that Division have been subject to a satisfactory level of review of substantive material by the Division Committee.

(iv) To ensure that any considered IUPAC view shall carry the fullest possible weight among other international organizations, all negotiations on matters concerned with nomenclature and symbols with other ICSU bodies, with the international standardizing organizations, and with CGPM and its Committees, shall be conducted through ICTNS, which shall advise the Executive Committee accordingly.

(v) To be responsible, after consultation with all relevant bodies of IUPAC, for the official IUPAC comments on all documents on nomenclature, symbols, terminology and conventions sent to the Union for comment.

(vi) To advise the President and the Executive Committee on suitable persons for appointment as representatives of IUPAC on other bodies concerned with nomenclature, symbols and terminology.

As a consequence, ICTNS is responsible for editing and approving the content of IUPAC Recommendations and Technical Reports for publication in *Pure and Applied Chemistry*, for approving publication of IUPAC reports in journals other than PAC that include publication of reports that contain new experimental data, for reviewing IUPAC-sponsored books for adherence to IUPAC standards of Terminology, Nomenclature, Symbols and Units, and also for approving, on behalf of IUPAC, publications emanating from international bodies on which IUPAC has representation. Editing of these publications is carried out by the respective organisation.

The ICTNS carries out these tasks by very extensive review processes. For IUPAC Recommendations, a Public Comment Period of five months is required, with input from members of ICTNS within three months. Both Recommendations and Technical Reports

are carefully scrutinized for conformity with IUPAC-approved Terminology and Nomenclature, and are also edited carefully for scientific content. For those documents whose source lies with international bodies, ICTNS also carries out careful reviews. The overall goal from these activities is to continue to enhance the reputation of IUPAC as a source of internationals standards in chemical terminology and nomenclature through publication of Pure and Applied Chemistry and continuing interaction with international organisations.

Publication of the on-line Gold Book *IUPAC Compendium on Chemical Terminology* provides an opportunity for nearly continuous update of IUPAC-approved terminology, as well as corrections where required. The ICTNS maintains up-to-date and detailed instructions for the preparation of publication for *Pure and Applied Chemistry* and also acts as a consulting resource for the Secretariat and other IUPAC bodies in answering queries from professionals and students on problems in terminology and nomenclature.

The Terms of Reference require ICTNS to conduct, and advise the Executive Committee accordingly, all negotiations concerned with nomenclature, terminology and symbols with other ICSU bodies, with international standardizing organisations, and with CGPM and its committees. This measure ensures that IUPAC views carry the fullest possible weight among other international organisations. In practice, ICTNS maintains contacts with IUPAC representatives on these organisations and also through ICTNS members from the Bureau International des Poids et Mesures (BIPM), International Organisation for Standardization (ISO), and the International Unions for Biochemistry and Molecular Biology (IUBMB), Crystallography (IUCr), Pharmacology (IUPHAR), and Pure and Applied Physics (IUPAP).

2.0 Changes to Operating Procedures

Nil

3.0 The Chair thanks the members (Titular, Associate and National Representative) of the ICTNS who have shouldered a heavy workload as described in the detailed Appendix below. The TMs are Professor Jürgen Stohner (Switzerland), Dr. Juris Meija (Canada), Dr. Gerard Moss (UK), Professor Jeremy Frey (UK); the AMs are Professor Rita Cornelis (Belgium), Dr. Milan Drabik (Slovakia), Dr. Jan Kaiser (UK). The Chair also thanks the staff at the Secretariat for their assistance especially Fabienne Meyers and Cheryl Wurzbacher, and at De Gruyter publishing Joshua Gannon.

R. D. Weir

Ron D. Weir, Chair

Juergen Stohner, Secretary

APPENDIX

A1.0 Summary of Publications in *PAC* for the period 01 July 2013 to 01 July 2015

The previous biennial reports by Professors J.W. Lorimer and R.D. Weir covered the periods from 01 June 2005 to 30 June 2009 (Lorimer), from 01 July 2009 to 30 June 2011 (Weir), and from 01 June 2013 to 30 June 2015 (Weir), respectively. In the following summary, the reference number, title, author names, and the project origination follow the entries shown within Manuscript Central.

To assess any trends in the results from work by ICTNS, the statistics for the 11 year period June 2005 to July 2015 are summarised in Table 1. There are shown the total numbers of Reports and Recommendations processed subdivided by journal pages reviewed for each category. Also shown are the numbers of revised versions of manuscripts that ICTNS processed as a consequence of the review process. Also listed are the total and average number of months elapsed between manuscript submission and publication in PAC.

In section 1.1.1 below, there are listed a complete list of manuscripts processed. Included are the titles, authors, PAC issue, dates of receipt and publication of each manuscript and the number of revised versions processed.

Table 1. Volume of Technical Reports and Recommendations processed by ICTNS

Total Articles **Technical Reports** **Recommendations**

PAC vol.	Total Articles			Note 1	Note 2	Note 3	Technical Reports			Note 1	Note 2	Note 3	Recommend-ations			Note 1	Note 2	Note 3
	#	pages pp	avg. pp	# revisions	# mos	avg mos	#	pages pp	avg. pp	# revisions	# mos	avg mos	#	pages pp	avg pp	# revisions	# mos	avg mos
77 (2005)	12	414	35	-	-	-	9	267	30	-	-	-	3	147	49	-	-	-
78 (2006)	13	354	27	-	-	-	8	168	21	-	-	-	5	186	37	-	-	-
79 (2007)	8	466	58	-	-	-	4	135	34	-	-	-	4	331	83	-	-	-
80 (2008)	12	463	39	-	-	-	6	168	28	-	-	-	6	295	48	-	-	-
81 (2009)	13	455	37	-	-	-	10	250	27	-	-	-	3	205	68	-	-	-
82 (2010)	10	266	27	-	-	-	8	170	21	-	-	-	2	96	48	-	-	-
83 (2011)	20	657	33	39	224	11	11	366	33	20	89	8	9	291	32	19	135	15
84 (2012)	12	450	38	14	100	8	7	169	24	9	62	9	5	281	56	5	38	7.6
85(2013)	18	592	33	35	267	8	11	293	27	18	131	7.2	7	299	43	17	136	8.0
86(2014)	16	443	28	21	147	7	13	397	31	15	106	7.1	3	46	15	6	41	6.8
87(2015)[4]	5	146	29	5	39	8	2	82	41	2	15	7.5	3	64	21	3	24	8.0

1. Total number of revisions processed by ICTNS.
2. Total number of months elapsed between submission date and on line publication in PAC.
3. Average number of months elapsed per manuscript.
4. Information up to 2015-07-31

Table 2. Books processed by ICTNS

Year	Medium	Pages	Pages
2013	IUPAC Blue Book (Nomenclature of Organic Chemistry)	1,351	
2013	Volume Properties: Liquids, Solutions and Vapours		623
2013	Future Energy: Sustainable & Clean Energy Alternatives		738
2014	Chemical Processes: Sustainable Future		800
2015	Climate Change, 2nd edition		669
2015	Experimental Thermodynamics IX B: Non-Equilibrium Thermodynamics and Applications		620
	Σ	1,351	3,450
	∑∑ = 4,801 pages		

A1.1 Publications reviewed, edited and approved by ICTNS for publication in *Pure and Applied Chemistry*

Total number of Recommendations and Technical Reports: (28)
Total pages published 01 July 2013 to 1 July 2015: (835)

A1.1.1 IUPAC Recommendations
Total number: 10
Total pages published: 253

PAC-REC-06-04-06 *Definitions of terms relating to mass spectrometry*, Kermit K. Murray, Robert K. Boyd, Marcos N. Eberlin, G. John Langley, Liang Li and Yasuhide Naito-Div V, PAC 85(7) 1515-1609 (2013), 95 pp.
24 April 2006 – 06 March 2013; 82 months; 8 revisions.

PAC-REC-12-05-10 *Definition of the halogen bond*, Gautam R. Desiraju, P. Shing Ho, Lars Kloo, Anthony C. Legon, Roberto Marquardt, Pierangelo Metrangolo, Peter Politzer, Giuseppe Resnati and Kari Rissanen-Div I, PAC 85(8) 1711-1714 (2013), 4 pp.
28 May 2012 – 22 May 2013; 12 months; 3 revisions.

PAC-REC-12-11-20 *Terminology of metal–organic frameworks and coordination polymers*, Stuart R. Batten, Neil R. Champness, Xiao-Ming Chen, Javier Garcia-Martinez, Susumu Kitagawa, Lars Öhrström, Michael O'Keeffe, Myunghyun Paik Suh and Jan Reedijk-Div II, PAC 85(8) 1715-1724 (2013), 10 pp.
28 Nov 2012 – 11 June 2013; 7 months; 1 revision.

PAC-REC-12-11-23 Glossary of terms used in medicinal chemistry, Part II, Derek R. Buckle, Paul W. Erhardt, C. Robin Ganellin, Toshi Kobayashi, Thomas J. Perun, John Proudfoot and Joerg Senn-Bilfinger-Div VII, PAC 85(8) 1725-1758, 34 pp.
30 Nov 2012 – 01 July 2013; 7 months; 2 revisions.

PAC-REC-12-08-01 *Definition of the transfer coefficient in electrochemistry*, Rolando Guidelli, Richard G. Compton, Juan M. Feliu, Eliezer Gileadi, Jacek Lipkowski, Wolfgang Schmickler and Sergio Trasatti-Div I, PAC 86(2) 259-262 (2014), 4 pp.
17 April 2013 – 21 November 2013; 7 months; 2 revisions.

PAC-REC-12-06-09 *ICTAC nomenclature of thermal analysis*, Trevor Lever, Peter Haines, Jean Rouquerol, Edward L. Charsley, Paul Van Eckeren and Donald J. Burlett-Div I, PAC 86(4) 555-583 (2014), 29 pp.

16 June 2012 – 16 January 2014; 19 months; 2 revisions.

PAC-REC-12-12-03 *Abbreviations of polymer names and guidelines for abbreviating polymer names*, Jiasong He, Jiazhong Chen, Karl-Heinz Hellwich, Michael Hess, Kazuyuki Horiea, Richard G. Jones, Jaroslav Kahovec, Tatsuki Kitayama, Pavel Kratochvil, Stefano V. Meille, Itaru Mitaa, Claudio dos Santos, Michel Vert and Jiři Vohlidal-Div IV, PAC 86(6) 1003-1015 (2014), 13 pp.

12 December 2012- 12 February 2014; 15 months; 2 revisions.

PAC-REC-13-02-01.R2 *Definitions of terms relating to individual macromolecules, macromolecular assemblies, polymer solutions, and amorphous bulk polymers* Robert Stepto, Taihyun Chang, Pavel Kratochvil, Michael Hess, Kazuyuki Horiea, Takahiro Sato and Jiři Vohlidal – Div VIII, PAC 87(1) 71–120 (2015), 50 pp.

1 February 2013 - 28 June 2014, 17 months, 2 revisions

PAC-REC-14-06-10 *Nomenclature and graphic representations for chemically modified polymers* Richard G. Jones, Tatsuki Kitayamaa, Edward S. Wilksa, Robert B. Fox, Alain Fradet, Karl-Heinz Hellwich, Michael Hess, Philip Hodge, Kazuyuki Horieb, Jaroslav Kahovec, Pavel Kratochvil, Przemyslaw Kubisa, Ernest Marechal, Werner Mormann, Christopher K. Ober, Robert F.T. Stepto, Michel Vert and Jiři Vohlidal – Div VIII, PAC 87(3) 307-319 (2015), 13 pp.

26 June 2014 - 18 December 2014, 7 months, 1 revision

PAC-REC-14-06-10 Erratum to *Nomenclature and graphic representations for chemically modified polymers* Richard G. Jones, Tatsuki Kitayamaa, Edward S. Wilksa, Robert B. Fox, Alain Fradet, Karl-Heinz Hellwich, Michael Hess, Philip Hodge, Kazuyuki Horieb, Jaroslav Kahovec, Pavel Kratochvil, Przemyslaw Kubisa, Ernest Marechal, Werner Mormann, Christopher K. Ober, Robert F.T. Stepto, Michel Vert and Jiři Vohlidal – Div VIII, PAC 87(4) 441 (2015), 1 p.

February 2015; 0 months, 0 revisions

A1.1.2 IUPAC Technical Reports
Total number: 18
Total pages published: 582

PAC-REP-10-02-38 *Assessment of theoretical methods for the study of hydrogen abstraction kinetics of global warming gas species during their degradation and by product formation*, Ponnadurai Ramasami, Hassan H. Abdallah, Edet F. Archibong, Paul Blowers, Thomas A. Ford, Rita Kakkar, Zhigang Shuai and Henry F. Schaefer, III-Div I, PAC 85(9) 1901-1918, 18 pp.

25 Feb 2010 – 01 July 2013; 40 months; 3 revisions.

PAC-REP-12-03-03 *Determination of the photoluminescence quantum yield of dilute dye solutions*, Ute Resch-Genger and Knut Rurack-Div V, PAC 85(10) 2005-2026, 22 pp.

05 March 2012 – 04 August 2013; 17 months; 2 revisions.

PAC-REP-13-06-03 *Chemical speciation of environmentally significant metals with inorganic ligands. Part 5: The Zn^{2+} + OH^-, Cl^-, CO_3^{2-}, SO_4^{2-}, and PO_4^{3-} systems*, Kipton J. Powell, Paul L. Brown, Robert H. Byrne, Tamás Gajda, Glenn Hefter, Ann-Kathrin Leuz, Staffan Sjöberg and Hans Wanner-Div V, PAC 85(12) 2249-2311, 63 pp.

10 June 2013 – 14 October 2013; 4 months; 1 revision.

PAC-REP-13-05-01 *A database of water transitions from experiment and theory*, Jonathan Tennyson, Peter F. Bernath, Linda R. Brown, Alain Campargue, Attila G. Császár, Ludovic Daumont, Robert R. Gamache, Joseph T. Hodges, Olga V. Naumenko, Oleg L. Polyansky, Laurence S. Rothman, Ann Carine Vandaele and Nikolai F. Zobov-Div I, PAC 86(1) 71-83 (2014), 13 pp.

24 May 2013 – 28 October 2013; 5 months; 1 revision.

PAC-REP- 13-10-23 *Assessment of international reference materials for isotope-ratio analysis*, Willi A. Brand, Tyler B. Coplen, Jochen Vogl, Martin Rosner and Thomas Prohaska-Div II, PAC 86(3) 425-467 (2014), 43 pp.

21 Oct 2013 – 11 December 2013; 2 months; 0 revisions.

PAC-REP-13-05-05 *Toward a comprehensive definition of oxidation state*, Pavel Karen, Patrick McArdle and Josef Takats-Div II, PAC 86(6) 1017-1081 (2014), 65 pp.

31 May 2013 – 13 January 2014; 8 months; 1 revision.

PAC-REP-12-06-05 *Single-molecule fluorescence imaging by total internal reflection fluorescence microscopy*, Alex E. Knight-Div III, PAC 86(8) 1303-1320 (2014), 18 pp.

06 June 2012-17 April 2014; 23 months; 2 revisions.

PAC-REP-13-09-18 Variation in the terrestrial isotopic composition and atomic weight of argon, J.K. Bohlke-Div II, PAC 86(9) 1421-1432 (2014), 12 pp.

20 September 2013-09 February 2014; 5 months; 0 revisions.

PAC-REP-13-10-20 Structural aspects of molecular recognition in the immune system. Part I: acquired immunity, Douglas M. Templeton and Kerstin Moehle-Div VII, PAC 86(10) 1435-1481 (2014), 47 pp.

18 October 2013 - 17 April 2014; 6 months; 1 revision.

PAC-REP-13-10-26 Structural aspects of molecular recognition in the immune system. Part II. Pattern recognition receptors, John A. Robinson and Kerstin Moehle-Div VII, PAC 86(10) 1483-1538 (2014), 56 pp.

22 October 2013 - 17 April 2014; 6 months; 1 revision.

PAC-REP-13-10-27 Immunodiagnostics and immunosensor design, Vladimir Gubala, Reinhild Klein, Douglas M. Templeton and Michael Schwenk-Div VII, PAC 86(10) 1539- 1571 (2014), 33 pp.

22 October 2013 - 17 April 2014; 6 months; 1 revision.

PAC-REP-13-10-28 Applications of immunochemistry in human health: advances in vaccinology and antibody design, Reinhild Klein, Douglas M. Templeton and Michael Schwenk-Div VII, PAC 86(10) 1573-1617 (2014), 35 pp.

22 October - 22 August 2014; 10 months; 1 revision.

PAC-REP-11-05-03 *The NPU format for clinical laboratory science reports regarding properties, units, and symbols* Georges Ferard and Rene Dybkaer – Div VII, PAC 86(12) 1923–1930 (2014), 8 pp.

19 May 2011 - 12 Nov 2011; 6 months, 2 revisions

PAC-REP-14-02-08 *Recommended isolated-line profile for representing high-resolution spectroscopic transitions* Jonathan Tennyson, Peter F. Bernath, Alain Campargue, Attila G. Csaszar, Ludovic Daumont, Robert R. Gamache, Joseph T. Hodges, Daniel Lisak, Olga V. Naumenko, Laurence S. Rothman, Ha Tran, Nikolai F. Zobov, Jeanna Buldyreva, Chris D. Boone, Maria Domenica De Vizia, Livio Gianfrani, Jean-Michel Hartmann, Robert McPheat, Damien Weidmann, Jonathan Murray, Ngoc Hoa Ngo and Oleg L. Polyansky – Div I, PAC 86(12) 1931–1943 (2014), 13 pp.

10 February 2014 - 11 September 2014; 7 months, 2 revisions

PAC-REP-13-06-01 *Guidelines for checking performance and verifying accuracy of rotational rheometers: viscosity measurements in steady and oscillatory shear* Martin Laun, Dietmar Auhl, Rudiger Brummer, Dirk J. Dijkstra, Claus Gabriel, Marc A. Mangnus, Maximilian Rullmann, Wim Zoetelief and Ulrich A. Handge – Div IV, PAC 86(12) 1945–1968 (2014), 24 pp.

3 June 2013 - 25 June 2014, 13 months, 2 revisions

PAC-REP-13-09-12 *Time-resolved fluorescence methods* Helge Lemmetyinen, Nikolai V. Tkachenko, Bernard Valeur, Jun-ichi Hotta, Marcel Ameloot, Nikolaus P. Ernsting, Thomas Gustavsson and Noel Boens– Div III, PAC 86(12) 1969–1998 (2014), 30 pp.

12 September 2013 - 30 May 2014, 9 months, 1 revision

PAC-REP-14-01-04 *Reference correlations for the viscosity and thermal conductivity of fluids over an extended range of conditions: hexane in the vapor, liquid, and supercritical reg*ions Richard A. Perkins, Marcia L. Huber, Marc J. Assael, Efthimia K. Mihailidou, Sofia K. Mylona and Evita A. Sykioti – Div I, PAC 87(3) 321-337 (2015), 17 pp.

21 January 14 – 25 August 2014; 7 months, 1 revision

PAC-REP-13-05-05 *Toward a comprehensive definition of oxidation state* Pavel Karen, Patrick McArdle and Josef Takats – Div II, PAC 87(6) 1017-1081 (2015), 65 pp.

13 May 2013 – 13 January 2014; 8 months, 1 revision

Report of the Project Committee

Submitted June 30, 2015
Doug Templeton

Prof. Doug Templeton succeeded Prof. Kip Powell as Chair of the Project Committee (PC) on Jan. 1, 2014. This report covers the first 18 months of the 2014/2015 Biennium.

The membership of the Committee is as follows:

Prof. Doug Templeton (Chair, Canada)
Dr. Fabienne Myers (Secretary, IUPAC Secretariat)
Prof. Natalia Tarasova (Ex officio, Russia)
Prof. Russell Boyd (Canada)
Prof. Javier Garcia-Martinez (Spain)
Prof. Ram Lamba (Puerto Rico)
Prof. Christopher Ober (USA)
Prof. Kaoru Yamanouchi (Japan)

The Committee met during the Bureau meeting in Coimbra, April 2014. Historical activities of the Committee were reviewed by the new members and Chair. Application forms to request funding from the PC were reviewed, especially in light of discussions with the Evaluation Committee, and no changes were deemed necessary at that time. Means to confirm that applicants receive the supplementary funding they indicate on application forms submitted to the PC were discussed.

The PC receives applications for funding for Projects and for Scientific Conferences.

Preference is given to projects that are highly rated for scientific quality and impact consistent with the goals of IUPAC. Projects are put forward to the PC by Divisions or Standing Committees, and are typically too large to be funded by a Division budget alone. Projects that are interdivisional, spanning the interests of more than one Division and Standing Committee are viewed favourably, and the willingness of the supporting Division(s) to co-fund the project is also an important factor.

While IUPAC Sponsorship of meetings and conferences does not entail financial support, such support may be requested from the PC in two circumstances: If the conference is of international scope and held in a "Scientifically Emerging Region" (with preference for funding regional participation of young scientists), or if the conference is deemed to promote truly "New Directions in Chemistry", typically of a highly interdisciplinary nature or of a rapidly emerging area of chemistry.

Summary of financial activity, Jan. 2014 - June 2015

This summary covers the first 18 months of the Biennium. Details of the applications (applicants names, project titles, amounts requested and awarded, etc.) are given in the Appendix. All monetary values are in USD.

Projects:

The PC's budget for projects for this Biennium is approximately $70,000.

The PC reviewed nine project applications and provided at least partial funding to all.

Total requested $96,270 (average request $10,697)
Total awarded $44,410 (average award $4,934)
Total co-funded (Division and SCs) $42,940

Funding for Scientific Conferences:

The PC's budget for FSCs for this Biennium is approximately $35,000.

Conferences in Scientifically Emerging Regions

The PC reviewed seven applications for FSC-SER and provided at least partial funding for six.

Total requested $61,800 (average request $8,828)
Total awarded $26,000 (average award $3,714)
Total co-funded (Division and SCs) $5,500

New Directions in Chemistry

The PC received one application for $3,750. It was not approved.

Special Operating Fund (SOF):

The PC has the option of referring applications to the IUPAC SOF that it deems to be worthy but to lie outside its mandate. Three such applications were received for a total request of $43,980; all were funded from SOF or additional sources.

Appendix - Details of requests to the PC, Jan. 2014 - June 2015

Information is reported with the following syntax:

Lead applicant surname 'Project Title' (Project no.)
Amount requested USD / **PC awarded** / Supporting & contributing Divisions & Committees

Projects

Kinnan 'IUPAC Color Book Data Management' (2013-052-1-024)
$8,500 / **$8,500** / [CPCDS, V, Interdivisional]

Mansfield 'Nomenclature of carbon nanotubes and related substances' (2013-056-1-800)
$14,000 / **$7,000** / [VIII ($7,000)]

Gröning 'Assessment of Stable Isotopic Reference Materials' (2014-002-1-200)
$7,100 / **$1,260** / [II ($2,840), V ($1,000), VI ($2,000)]

Holden 'Development and Global Dissemination of an IUPAC Interactive Electronic Isotopic Periodic Table and Supporting Resources for the Education Community' (2014-024-1-200)
$17,920 ($9,920 PC) / **$6,000** / [II ($4,000), CCE ($4,000)]

Stohner 'Preparation of the 4th revised printing of the Green Book 3rd Edition' (2014-021-1-100)
$13,000 / **$5,000** / [I ($5,000)]

Straut 'Increasing IUPAC's Social Media presence' (2013-055-2-024)
$5,000 / **$3,000** / [CPCDS]

Prohaska 'Generation of a web-based platform for ... natural and synthetic materials via crowdsourcing' (2014-016-2-200)
$9,150 / **$4,150** / [II ($3,000), V ($1,000), VI ($1,000)]

West 'IUPAC Safety Training Program Workshop, Busan, Korea' (2015-005-1-022)
$12,600 / **$5,000** / [COCI ($7,600)]

Vert 'Nomenclature for polymeric carriers bearing chemical entities with specific activities and names' (2014-034-2-400)
$9,000 / **$4,500** / [IV ($2,250), VIII ($2,250)]

FSC scientifically emerging regions

Mammino '5th International IUPAC Conference on Green Chemistry (ICGC5)', Durban, South Africa (2013-038-1)

$5,000 / **$4,200** / [III]

Wijesekera, 'Professional Chemical Education & Research for Industrial Development & Sustainable Economic Growth', Colombo, Sri Lanka (2014-009-1)
$15,000 / **$4,500** / [CCE]

Mosihuzzaman, 'CHEMRAWN Conference on herbal medicines', Bangladesh (2014-008-1)
$15,000 / **Nil** / [CHEMRAWN]

van Reenen '13th Annual UNESCO/IUPAC Workshop and Conference on Macromolecules & Materials' Port Elizabeth, South Africa (2014-029-1)
$8,000 / **$4,000** / [IV]

Mammino 'ACRICE 2, African Conference on Research in Chemical Education', University of Venda, Thohoyandou, South Africa (2014-039-2)
$4,800 / **$4,800** / [CCE]

Boniface 'ChemEd 2015', Wellington, NZ (2014-017-1)
$7,000 / **$3,500** / [CCE ($3,500)]

Shakil '3rd International Conference on Agrochemicals Protecting Crops, Health and Natural Environment –New Chemistries for Pest Control', New Delhi (2014-036-1)
$7,000 / **$5,000** / [VI ($2,000)]

FSC new directions in chemistry

Garrigues 'European Conference on Analytical Chemistry EUROANALYSIS XVIII' Bordeaux, France (2015-011-1)
$3,750 / **Nil** / [V]

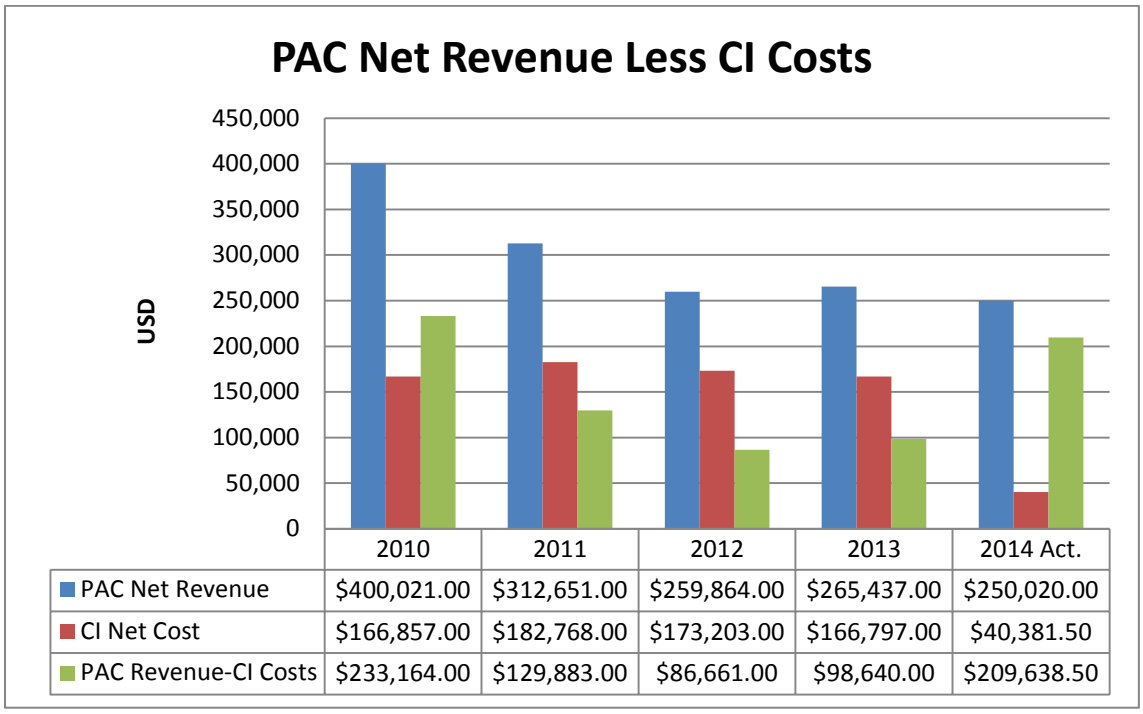
Referred to SOF

Hanley 'Company Associates, Voice Of the Customer [VOC] data gathering' (2014-018-2-022)
$7,000 / **approved** / [SOF ($4,000), COCI ($3,000)]

Cesa 'IUPAC Strategy Review' (2014-042-2-020)
$21,980 / **approved** / [SOF ($21,980)]

Chiu 'IUPAC's contribution to achieving the new UN Sustainable Development Goals – the focus for the 2015 World Chemistry Leadership Meeting in Busan, Korea' (2015-004-1-020)
$12,000 / **approved** / [SOF ($12,000), VI ($1,000), COCI ($1,000), CCE ($1,000)]

19.1 PAC Net Revenue less CI Costs



	2010	2011	2012	2013	2014 Act.
PAC Net Revenue	$400,021.00	$312,651.00	$259,864.00	$265,437.00	$250,020.00
CI Net Cost	$166,857.00	$182,768.00	$173,203.00	$166,797.00	$40,381.50
PAC Revenue-CI Costs	$233,164.00	$129,883.00	$86,661.00	$98,640.00	$209,638.50

IUPAC Finance Committee

Decision to Change Bank and Investor Relationship

1. Fact Finding Guidelines

IUPAC currently uses Wells Fargo as the banking (checking account) and investment partners in Raleigh (formerly NCNB, then Wachovia). All the complex finance operations and the investment portfolios were held by Wells Fargo. Many changes in the management in our Raleigh operations have shown, that our investment services were, in many ways, suboptimal and passively managed.
Therefore, the Finance Committee made the decision to evaluate the investment portfolio management and determine alternative approaches and advisory firms at the meeting held on February 10th 2014 with the objective of making a change in our relationship and validating our future partnership.

2. Analysis of the Portfolio

Merrill Lynch conducted an extensive analysis of our investment portfolio (fixed income and equities) and developed a Wealth Management proposal for its improvement. Their investment analysis done July 10, 2014 showed that our overall investment financial performance was acceptable but included some cumulative risks and costs of which we were previously unaware. The lack of transparency of the mutual funds (American Funds) was unacceptable as significant redundancies in the mutual equity funds area existed. In addition, some components of the fixed income portfolio would benefit from modifications.

3. Cash flow scenarios

The Finance Committee was made aware by the Treasurer that we had some cash flow shortages after the GA in Istanbul and that some of the bonds were used to bridge this shortfall. Clearly, the Investment Portfolio and Operating cash flow needed to be better interconnected and operationally efficient. This was an urgent problem in 2013 without an Executive Director in Raleigh.
With the help of the Treasurer and the recently appointed Executive Director, Lynn Soby, we were able to obtain some important inside views of the problem. (e.g. effect on cash flow given the DeGruyter arrangement, spending, expenses and subscriptions)

4. In Search of Alternatives

Merrill Lynch, Robert W. Baird & Co.(Riverfront) and BB&T/Scott & Springfellow were included as alternative Wealth Management firms to consider. In telecommunication sessions – with the intensive help of Lynn Soby – the three companies were validated in terms of operational models, portfolio proposals, costs and trustfulness. This was done with a checklist focusing on financial performance, operational effectiveness and organizational fit. R. W .Baird was eliminated – because of lack of international exposure (only US funds) and banking interface. Merrill Lynch and BB&T were the two remaining candidates. Merrill Lynch, well known to us from

former times, had some weakness in the local day to day contacts in Raleigh and their portfolio return for potential free cash flow was less than BB&T.

5. Decision

The decision of the Finance Committee is to consolidate our operating accounts (currently Wells Fargo Checking and BB&T US and Euro accounts) and the investment portfolio to BB&T /Scott & Stringfellow. This will eliminate the need to manage two banking operations and streamline IUPAC's international currency receipts/payments.

The company has the advantage of being a very old and well established finance organization serving IUPAC with a full range of possibilities (engaged local management, short term operational credits, international transactions and very interesting portfolio propositions). It offers some very helpful assistance locally and their investment proposal is serving our targeted needs. Risks and chances are transparent and regular reporting with analyses is secured.

We propose that the Executive Director and the Treasurer now plan and implement the change from Wells Fargo to BB&T/Scott & Stringfellow.

Respectfully Submitted,

Christoph Buxtorf
Chairman, IUPAC Finance Committee

October 31, 2014

WELLS FARGO ADVISORS

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IUPAC
ATTN LYNN SOBY
PO BOX 13757
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SNAPSHOT

Current period ending November 30, 2014

ACCOUNT NAME: IUPAC
ATTN LYNN SOBY

ACCOUNT NUMBER: 7924-0095

Your Financial Advisor:
Z201 ACAT REP
Phone: 800-359-9297

401 SOUTH TRYON STREET
CHARLOTTE, NC 28202

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About this statement

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Estimated Annual Income (EAI), when available, reflects the estimated amount you would earn on a security if your current position and its related income remained constant for a year. Estimated Annual Yield (EAY), when available, reflects the current estimated annual income divided by the current value of the security as of the statement closing date. EAI and EAY are estimates and the actual income and yield might be lower or higher than the estimated amounts. EAY reflects only the income generated by an investment. It does not reflect changes in its price, which may fluctuate. The information used to derive these estimates is obtained from various outside vendors; FCC and our Firm are not responsible for incorrect or missing estimated annual income and yields. Past performance is not a guarantee of future results.

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The income summary displays all income as recorded in the tax system as of period end date. The totals in the Cash flow snapshot may not match the totals in the Income snapshot due to reclassifications or other corrections made in the tax system. Remember, you may have certain products that are not included in these figures and whose income is only available on the tax forms sent to you at year-end. Reclassifications and other tax reporting requirements may alter these numbers both during and after year end. You should rely only on tax reporting documents. Contact your tax advisor if you have any questions about the tax consequences of your brokerage activity.

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SNAPSHOT [redacted]

IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Progress summary

	THIS PERIOD	THIS YEAR
Opening value	**$3,137,498.25**	**$3,064,322.79**
Cash deposited	0.00	0.00
Securities deposited	0.00	0.00
Cash withdrawn	-114,325.67	-183,158.67
Securities withdrawn	-3,031,034.49	-3,031,034.49
Income earned	5,125.05	71,514.61
Change in value	2,736.86	78,355.76
Closing value	**$0.00**	**$0.00**

sheet 78,190

$165.76

Portfolio summary

	ASSET TYPE	PREVIOUS VALUE ON OCT 31	%	CURRENT VALUE ON NOV 30	%	ESTIMATED ANN. INCOME
ASSETS	Cash and sweep balances	9,200.62	0.29	0.00	0.00	0
	Stocks, options & ETFs	0.00	0.00	0.00	0.00	0
	Fixed income securities	1,318,859.50	42.04	0.00	0.00	0
	Mutual funds	1,809,438.13	57.67	0.00	0.00	0
	Asset value	**$3,137,498.25**	**100%**	**$0.00**	**0%**	**$0**

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IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Cash flow summary

	THIS PERIOD	THIS YEAR
Opening value of cash and sweep balances	**$9,200.62**	
Income and distributions	5,125.05	71,514.61
Securities sold and redeemed	100,000.00	100,000.00
Net additions to cash	**$105,125.05**	**$171,514.61**
Securities purchased	0.00	-21,413.90
Electronic funds transfers	0.00	-68,833.00
Other subtractions	-114,325.67	-114,325.67
Net subtractions from cash	**-$114,325.67**	**-$204,572.57**
Closing value of cash and sweep balances	**$0.00**	

Income summary

		THIS PERIOD	THIS YEAR
TAXABLE	Money market/sweep funds	0.05	0.71
	Interest	5,125.00	50,100.00
	Ordinary dividends and ST capital gains	0.00	19,682.71
	Long term capital gains	0.00	1,731.19
	Total taxable income	**$5,125.05**	**$71,514.61**
	Total federally tax-exempt income	**$0.00**	**$0.00**
	Total income	**$5,125.05**	**$71,514.61**

Gain/loss summary

	THIS PERIOD REALIZED	THIS YEAR REALIZED
Short term (S)	0.00	0.00
Long term (L)	-2,217.27	-2,217.27
Total	**-$2,217.27**	**-$2,217.27**

IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Your Financial Advisor

Z201 ACAT REP
Phone: 800-359-9297

401 SOUTH TRYON STREET
CHARLOTTE, NC 28202

Client service information

Client service:	866-281-7436
Website:	www.wellsfargoadvisors.com

Account profile

Full account name:	IUPAC ATTN LYNN SOBY
Account type:	Standard Brokerage
Brokerage account number:	7924-0095
Tax status:	Non-Profit
Investment objective/Risk tolerance:*	MODERATE GROWTH & INCOME
Time horizon:*	LONG TERM (10+ YEARS)
Liquidity needs:*	NONE
Cost Basis Election:	First in, First out
Sweep option:	BANK DEPOSIT SWEEP

*For more information, go to www.wellsfargoadvisors.com/disclosures.

For your consideration

Go paperless. Accessing your account documents online is easy, secure, and costs nothing. Sign on to **wellsfargoadvisors.com** with your online access Username and Password, select **Statements & Docs**, and then click on the **Delivery Preferences** Quick Link. Choose **Electronic Delivery** to go paperless or select specific account documents for electronic delivery. If you do not have a Username and Password, visit **wellsfargoadvisors.com/signup** or call 1-866-281-7436 for enrollment assistance.

Document delivery status

	Paper	Electronic
Statements:	X	X
Trade confirmations:	X	X
Tax documents:	X	X
Shareholder communications:	X	X
Other documents:	X	X

IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Additional information

	THIS PERIOD	THIS YEAR
Gross proceeds	100,000.00	100,000.00

Activity detail

DATE	ACCOUNT TYPE	TRANSACTION	QUANTITY	DESCRIPTION	PRICE	AMOUNT	CASH AND SWEEP BALANCES
11/01				BEGINNING BALANCE			9,200.62
11/03	Cash	INTEREST		JP MORGAN CHASE & CO SUB GLOBAL NOTES CPN 5.250% DUE 05/01/15 DTD 04/24/03 FC 11/01/03 110114 100,000 AS OF 11/01/14 CUSIP 46625HAX8		2,625.00	11,825.62
11/13	Cash	CHARGE		TERMINATION FEE		-95.00	11,730.62
11/14	Cash	INTEREST		BANK DEPOSIT SWEEP 111414 11,825.62000		0.05	11,730.67
11/17	Cash	INTEREST		WELLS FARGO COMPANY SUBORDINATE GLOBAL NOTES CPN 5.000% DUE 11/15/14 DTD 11/06/02 FC 05/15/03 111514 100,000 AS OF 11/15/14 CUSIP 949746CR0		2,500.00	
11/17	Cash	REDEMPTION	-100,000.00000	WELLS FARGO COMPANY SUBORDINATE GLOBAL NOTES CPN 5.000% DUE 11/15/14 DTD 11/06/02 FC 05/15/03 CUSIP 949746CR0		100,000.00	
11/17	Cash	ASSET TRF		TRANSFER CASH BALANCE		-11,730.65	102,500.02
11/26	Cash	ASSET TRF		TRANSFER CASH BALANCE		-102,500.02	0.00

WELLS FARGO ADVISORS

IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Non cash activity detail

This section displays security transfer activity for the current period. The price and value are as of the date of the transfer.

Transfers out

DATE	ACCOUNT TYPE	TRANSACTION	QUANTITY	DESCRIPTION	PRICE	VALUE
11/17	Cash	ASSET TRF	-3,798.81200	CAPITAL INCOME BLDR CL A TO: BB&T SECURITIES, LLC	60.8600	-231,195.69
11/17	Cash	ASSET TRF	-5,168.62800	CAPITAL WORLD GROWTH & INCOME FD INC CLASS A TO: BB&T SECURITIES, LLC	46.9900	-242,873.82
11/17	Cash	ASSET TRF	-5,824.00300	EUROPACIFIC GROWTH FD CLASS A TO: BB&T SECURITIES, LLC	48.6200	-283,163.02
11/17	Cash	ASSET TRF	-3,523.34100	FUNDAMENTAL INVS INC CLASS A TO: BB&T SECURITIES, LLC	55.3200	-194,911.22
11/17	Cash	ASSET TRF	-14,822.12300	INCOME FUND AMER INC CLASS A TO: BB&T SECURITIES, LLC	21.9100	-324,752.71
11/17	Cash	ASSET TRF	-2,712.77600	SMALLCAP WORLD FD A TO: BB&T SECURITIES, LLC	49.3500	-133,875.49
11/17	Cash	ASSET TRF	-2,668.25100	VANGUARD INDEX TR MID CAP INDEX FD ADMIRAL SHS TO: BB&T SECURITIES, LLC	151.8300	-405,120.54
11/17	Cash	ASSET TRF	-100,000.00000	ANHEUSER-BUSCH COS INC NOTES CALLABLE CPN 5.050% DUE 10/15/16 DTD 10/14/03 FC 04/15/04 CUSIP 035229CV3 TO: BB&T SECURITIES, LLC	107.7260	-107,726.00
11/17	Cash	ASSET TRF	-100,000.00000	BB&T CORPORATION SUBORDINATE NOTES CPN 4.900% DUE 06/30/17 DTD 06/30/05 FC 12/30/05 CUSIP 054937AG2 TO: BB&T SECURITIES, LLC	108.5380	-108,538.00

IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Non cash activity detail continued

Transfers out

DATE	ACCOUNT TYPE	TRANSACTION	QUANTITY	DESCRIPTION	PRICE	VALUE
11/17	Cash	ASSET TRF	-100,000.00000	CHESAPEAKE ENERGY CORP SENIOR NOTES CALLABLE CPN 7.250% DUE 12/15/18 DTD 05/27/08 FC 12/15/08 CUSIP 165167CC9 TO: BB&T SECURITIES, LLC	114.0000	-114,000.00
11/17	Cash	ASSET TRF	-100,000.00000	HARTFORD FINL SVCS GRP SR NOTES CPN 5.375% DUE 03/15/17 DTD 03/09/07 FC 09/15/07 CUSIP 416515AT1 TO: BB&T SECURITIES, LLC	108.6860	-108,686.00
11/17	Cash	ASSET TRF	-100,000.00000	HEWLETT-PACKARD CO UNSECURED CPN 2.600% DUE 09/15/17 DTD 03/12/12 FC 09/15/12 CUSIP 428236BW2 TO: BB&T SECURITIES, LLC	102.0280	-102,028.00
11/17	Cash	ASSET TRF	-100,000.00000	AT&T INC SR UNSECURED CPN 3.000% DUE 02/15/22 DTD 02/13/12 FC 08/15/12 CUSIP 00206RBD3 TO: BB&T SECURITIES, LLC	98.7770	-98,777.00
11/17	Cash	ASSET TRF	-100,000.00000	JP MORGAN CHASE & CO SUB GLOBAL NOTES CPN 5.250% DUE 05/01/15 DTD 04/24/03 FC 11/01/03 CUSIP 46625HAX8 TO: BB&T SECURITIES, LLC	101.9910	-101,991.00
11/17	Cash	ASSET TRF	-100,000.00000	PROCTER & GAMBLE CO GLOBAL BONDS CPN 4.850% DUE 12/15/15 DTD 11/25/03 FC 06/15/04 CUSIP 742718BZ1 TO: BB&T SECURITIES, LLC	104.9260	-104,926.00

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IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Non cash activity detail continued

Transfers out

DATE	ACCOUNT TYPE	TRANSACTION	QUANTITY	DESCRIPTION	PRICE	VALUE
11/17	Cash	ASSET TRF	-150,000.00000	PROCTER & GAMBLE CO/THE SR UNSECURED CPN 2.300% DUE 02/06/22 DTD 02/06/12 FC 08/06/12 CUSIP 742718DY2 TO: BB&T SECURITIES, LLC	98.2940	-147,441.00
11/17	Cash	ASSET TRF	-100,000.00000	UNITED HEALTH GROUP BONDS CPN 5.375% DUE 03/15/16 DTD 03/02/06 FC 09/15/06 CUSIP 91324PAQ5 TO: BB&T SECURITIES, LLC	106.2910	-106,291.00
11/17	Cash	ASSET TRF	-100,000.00000	THOMSON REUTERS CORP BONDS CALLABLE CPN 6.500% DUE 07/15/18 DTD 06/20/08 FC 01/15/09 CUSIP 884903BB0 TO: BB&T SECURITIES, LLC	114.7380	-114,738.00
				Total Transfers out:		**-$3,031,034.49**

Cash sweep activity

Our Cash Sweep program allows you to earn a return on the idle cash balances in your account by automatically investing such balances into one of our cash sweep options. These 'sweep transactions' may represent a net amount for the day and occur on settlement date. The following section displays transfers into and out of your sweep option. Transactions displayed here are Transfer To, Transfer From and Reinvested Dividends and Interest. These transaction amounts are not included in your cash flow summary.

DATE	TRANSACTION	DESCRIPTION	AMOUNT
11/01		BEGINNING BALANCE	9,200.62
11/04	TRANSFER TO	BANK DEPOSIT SWEEP	2,625.00
11/14	TRANSFER FROM	BANK DEPOSIT SWEEP	-11,825.62
11/30		ENDING BALANCE	0.00

IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Bank Deposits Through Teller

November 1 - November 30

Wells Fargo Bank, N.A. (Member FDIC) **Account number 4003405417** **Questions? Call us at 1-800-266-6263**

Deposits made in a bank branch on the last business day of the month will typically appear on your next statement.

DATE	TRANSACTION	DESCRIPTION	AMOUNT	BANK BALANCE
11/01		BEGINNING BALANCE		$0.00
11/30		ENDING BALANCE		$0.00

Realized gain/loss

Realized Gain/Loss Summary

	THIS PERIOD GAIN	THIS PERIOD LOSS	THIS PERIOD NET	THIS YEAR GAIN	THIS YEAR LOSS	THIS YEAR NET
Short term	0.00	0.00	0.00	0.00	0.00	0.00
Long term	0.00	-2,217.27	-2,217.27	0.00	-2,217.27	-2,217.27
Total Realized Gain/Loss	**$0.00**	**-$2,217.27**	**-$2,217.27**	**$0.00**	**-$2,217.27**	**-$2,217.27**

WELLS FARGO ADVISORS

IUPAC
ATTN LYNN SOBY

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 7924-0095

Realized Gain/Loss Detail

Long term

DESCRIPTION	QUANTITY	ADJ PRICE/ ORIG PRICE	DATE ACQUIRED	CLOSE DATE	PROCEEDS	ADJ COST/ ORIG COST	GAIN/LOSS
WELLS FARGO COMPANY SUBORDINATE GLOBAL NOTES CPN 5.000% DUE 11/15/14 DTD 11/06/02 FC 05/15/03 CUSIP 949746CR0	100,000.00000	0.0000	11/19/02nc	11/17/14	100,000.00	102,217.27	-2,217.27
Total Long term					**$100,000.00**	**$102,217.27**	**-$2,217.27**

nc Cost information for this tax lot is not covered by IRS reporting requirements. Unless indicated, cost for all other lots will be reported to the IRS.

Specific instructions and disclosures

Income on non-reportable accounts
Your income summary is categorized into taxable and tax-exempt income based upon the securities that you hold. Please be aware that, since this is a 1099 non-reportable account, this income will NOT be reported to the IRS, but is being provided to you for informational purposes only.

Cost basis - To add or update information or modify your reporting options, please contact Your Financial Advisor.
This statement presents estimated unrealized or realized gains or losses for your information only. If acquisition or other information is not available, the gain/loss information may not be displayed and section and summary totals may not reflect your complete portfolio. Cost basis information is not verified by FCC or Wells Fargo Advisors and should not be relied upon for legal or tax purposes. Revisions to this information (due to corporate mergers, tenders and other reorganizations) may be required from time to time.

Cost basis for factored bonds (GNMA, CMO, etc.) will be adjusted for paydown of principal. Systematic investments in mutual funds and reinvested dividends for mutual funds and stocks have been consolidated for each position. Unit cost data for systematic investments and dividend reinvestment securities is provided for informational purposes only and is a non-weighted average.

Your account statement should not be used for tax preparation without assistance from your tax consultant. We do not report capital gains or losses for non-covered securities to the IRS.

Cost basis options
Unless specific tax lots are selected at trade time, sales of tax lots will occur using the cost basis election reflected in the Account profile section.

Statement balancing guide

1 Record in your account register all items which may appear on this statement that have not previously been entered in your account register, such as ATM/Check Card transactions, automatic transfers, preauthorized drafts, interest earned, service charges, proceeds from sales, security purchases, etc.

2 In your account register, check off the additions and subtractions as shown in the Activity Detail Section.

3 In the Outstanding Additions section at the right (Section A), list any outstanding additions such as deposits, dividends and interest, proceeds from sales, etc., that have been made since the date of this statement.

4 In the Outstanding Subtractions section at the right (Section B), list any checks that have not yet been paid and any outstanding subtractions such as ATM/Check Card transactions and any margin interest, service fees and purchases, etc., that have been made since the date of this statement.

5 Write in the Closing Balance shown in the Cash flow summary. _____

6 Write in the total amount of Outstanding additions (Section A). +_____

7 Total the amounts in lines 5 & 6. =_____

8 Write the total amount of Outstanding Subtractions (Section B). -_____

9 Subtract the amount in line 8 from the amount in line 7. This is your **Adjusted Statement Balance.** =_____

A. Outstanding Additions

Date	Amount	
	$	
Total		

B. Outstanding Subtractions

Number	Amount	
	$	
Total		

WELLS FARGO ADVISORS

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IUPAC
EURO BOND ACCT
PO BOX 13757
RTP NC 27709

SNAPSHOT
Current period ending November 30, 2014

ACCOUNT NAME: IUPAC
EURO BOND ACCT

ACCOUNT NUMBER: 3264-6780

Your Financial Advisor:
Z201 ACAT REP
Phone: 800-359-9297

401 SOUTH TRYON STREET
CHARLOTTE, NC 28202

If you have more than one account with us, why not link them and receive summary information for your entire household? Contact Your Financial Advisor for more details.

Message from Wells Fargo Advisors

WITH TAX SEASON LOOMING, SIGN UP NOW FOR CONVENIENT ONLINE ACCESS TO YOUR ACCOUNT DOCUMENTS, PORTFOLIO DETAILS, PERFORMANCE, ACTIVITY, AND MORE AT WELLSFARGOADVISORS.COM/SIGNUP. THEN DOWNLOAD THE WELLS FARGO APP ON YOUR MOBILE DEVICE TO SECURELY ACCESS YOUR ACCOUNTS ON THE GO.

General instructions and disclosures

About this statement

Clearing services

First Clearing, LLC ("FCC"), an indirect wholly owned subsidiary of Wells Fargo & Company, is a clearing broker-dealer registered with the Securities and Exchange Commission ("SEC") and is a member of the New York Stock Exchange ("NYSE"), the Financial Industry Regulatory Authority ("FINRA") and all principal U.S. exchanges. FCC carries your account(s) and acts as your custodian for funds and securities deposited with us directly by you, through our affiliated broker-dealer, Wells Fargo Advisors, LLC ("Wells Fargo Advisors") or as a result of transactions we process for your account. Twice a year, FCC publishes on its web site **www.firstclearingllc.com** a statement of the firm's financial condition. Alternatively, a printed statement is available to you upon request. Unless and until we receive written notice from you to the contrary, FCC may, without inquiry or investigation, accept from Wells Fargo Advisors (i) orders for the purchase or sale of securities for your account on margin or otherwise, and (ii) any other instructions concerning your account.

Trade date statement

All activity and positions on this statement are shown as of the date a trade is entered on the brokerage trading system (i.e., the trade date). Proceeds from the sale of securities and costs for the purchase of securities are not transacted through your account until the actual settlement date of the trade, which may be up to three business days after the trade date (or longer for certain securities with an extended settlement date).

Pricing of securities

Securities prices reflected on your statement may vary from actual liquidation value. Prices shown are provided by outside quotation services which we believe to be reliable but due to the nature of market data the accuracy of such prices cannot be guaranteed, or in the absence of such pricing, are estimated by Wells Fargo Advisors using available information and its judgment. Such estimates may not reflect actual trades and do not reflect a commitment by the firm to buy or sell at those prices. Securities listed on a national exchange such as the NYSE or Nasdaq Stock Market are priced as of the close of the statement period. Unlisted shares may be valued at the current best published "bid-price", and, if none exists, the last reported transaction if occurring within the last 45 days. Prices of securities not actively traded may not be available and are indicated by "N/A." Corporate and municipal bonds and other fixed income securities are priced by a computerized pricing service or, for less actively traded issues, by utilizing a yield-based matrix system to arrive at an estimated market value. Listed options are priced based on the closing "bid-ask" prices and the last reported trade. Mutual fund shares are priced at net asset value. Shares of direct participation program ("DPP") and real estate investment trust ("REIT") securities that are not listed on a national exchange are generally illiquid. Because no formal trading market may exist for these investments, their values are estimated. Unless otherwise indicated, the values shown for DPP and REIT securities have been provided by the management of each program and represent that management's estimate of the investor's interest in the net assets of the program. See statement sections for additional pricing information. Prices for hedge funds and certain managed futures funds are provided on a month delay basis. Other managed futures funds may be priced more frequently. Long-term certificates of deposit (maturity beyond one year from date of issue) are priced using a market value pricing model. Generally, the sale or redemption price of your securities may be higher or lower than the prices shown on your statement. For an actual quote, contact the individual servicing your account.

Estimated annual income/yield

Estimated Annual Income (EAI), when available, reflects the estimated amount you would earn on a security if your current position and its related income remained constant for a year. Estimated Annual Yield (EAY), when available, reflects the current estimated annual income divided by the current value of the security as of the statement closing date. EAI and EAY are estimates and the actual income and yield might be lower or higher than the estimated amounts. EAY reflects only the income generated by an investment. It does not reflect changes in its price, which may fluctuate. The information used to derive these estimates is obtained from various outside vendors; FCC and our Firm are not responsible for incorrect or missing estimated annual income and yields. Past performance is not a guarantee of future results.

Income summary

The Income summary displays all income as recorded in the tax system as of period end date. The totals in the Cash flow snapshot may not match the totals in the Income snapshot due to reclassifications or other corrections made in the tax system. Remember, you may have certain products that are not included in these figures and whose income is only available on the tax forms sent to you at year-end. Reclassifications and other tax reporting requirements may alter these numbers both during and after year end. You should rely only on tax reporting documents. Contact your tax advisor if you have any questions about the tax consequences of your brokerage activity.

About your rights and responsibilities

Questions and complaints about Your Account

This account statement contains important information about your brokerage account, including recent transactions. All account statements sent to you shall be deemed complete and accurate if not objected to in writing within ten days of receipt. We encourage you to review the details in this statement. If you do not understand any of the information in your statement or if you believe there are any inaccuracies or discrepancies in your statement, you should promptly report them to both FCC and to the manager of the Wells Fargo Advisors office listed on the front of your statement. To further protect your rights, including any rights under the Securities Investor Protection Act, any verbal communications with either your Wells Fargo Advisors office or with FCC should be re-confirmed in writing. Inquiries or complaints about your account statement, including the positions and balances in your account, may be directed to **Wells Fargo Advisors Client Services at (866) 281-7436 or First Clearing Client Services at ATTN: H0005-087, 1 N. Jefferson Ave, St. Louis, MO 63103, (800) 727-0304.**

Public Disclosure: You may reach FINRA by calling the FINRA BrokerCheck Hotline at **(800) 289-9999** or by visiting the FINRA website at www.finra.org. An investor brochure that includes information describing FINRA BrokerCheck is available from FINRA upon request. A brochure describing the FINRA Pricing of Securities Regulation Public Disclosure Program is also available from the FINRA upon request.

SIPC Protection

Securities and cash in client accounts have two sources of protection. Wells Fargo Advisors is a member of the Securities Investor Protection Corporation ("SIPC"). SIPC protects the clients of its member firms against the loss of their securities in the event of the member's insolvency and liquidation. Each client is insured up to a maximum of $500,000 (including $250,000 for claims for cash). For more information on SIPC coverage, please see the explanatory brochure at **www.sipc.org** or contact SIPC at **(202) 371-8300**. In addition, Wells Fargo Advisors maintains a program of excess protection. This additional insurance coverage is provided through Lexington Insurance Company, ("Lexington"), an AIG Company. For clients who have received the full SIPC payout limit, Wells Fargo Advisors' policy with Lexington provides additional coverage above the SIPC limits for any missing securities and cash in client brokerage accounts up to a firm aggregate limit of $1 billion (including up to $1.9 million for cash per client). SIPC and the additional protection do not insure the quality of investments or protect against losses from fluctuating market value.

Investor education

Wells Fargo Advisors publishes on its web site **www.wellsfargoadvisors.com** information on topics of interest to investors as well as market commentary and economic analysis. Wells Fargo Advisors has also developed numerous investor education guides to provide you with important information regarding the products and services we offer. These guides may be found under the "Investor Education" tab.

Free credit balances

Free credit balances are not segregated and may be used by FCC in the operation of its business in accordance with applicable laws and regulations. You have the right to receive from us in the course of normal business operations, subject to any open commitments in any of your accounts, any free credit balances to which you are entitled.

Investment objectives/Risk tolerances

Please inform us promptly of any material change that might affect your investment objectives, risk tolerances or financial situation, or if you wish to impose or change any reasonable restrictions on the management of your account. A copy of the Investment Advisory Services Disclosure document is available without charge upon request. Please contact the individual denoted on the front of your statement to update your information and to receive a copy of this document.

Tax reporting

We are required by federal law to report annually to you and to the Internal Revenue Service ("IRS") on Form(s) 1099 interest income, dividend payments and sales proceeds including cost basis information for applicable transactions credited to your account.

WELLS FARGO ADVISORS

SNAPSHOT [redacted]

IUPAC
EURO BOND ACCT

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 3264-6780

Progress summary

	THIS PERIOD	THIS YEAR
Opening value	**$791,363.19**	**$882,839.85**
Cash deposited	0.00	19,387.00
Securities deposited	0.00	0.00
Cash withdrawn	-271,548.68	-334,523.68
Securities withdrawn	-518,891.70	-518,891.70
Income earned	1.19	32,757.43
Change in value	-924.00	-81,568.90
Closing value	**$0.00**	**$0.00**

Portfolio summary

	ASSET TYPE	PREVIOUS VALUE ON OCT 31	%	CURRENT VALUE ON NOV 30	%	ESTIMATED ANN. INCOME
ASSETS	Cash and sweep balances	271,547.49	34.31	0.00	0.00	0
	Stocks, options & ETFs	0.00	0.00	0.00	0.00	0
	Fixed income securities	519,815.70	65.69	0.00	0.00	0
	Mutual funds	0.00	0.00	0.00	0.00	0
	Asset value	**$791,363.19**	**100%**	**$0.00**	**0%**	**$0**

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IUPAC
EURO BOND ACCT

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 3264-6780

Cash flow summary

	THIS PERIOD	THIS YEAR
Opening value of cash and sweep balances	**$271,547.49**	
Income and distributions	1.19	32,757.43
Securities sold and redeemed	0.00	265,353.00
Electronic funds transfers	0.00	19,387.00
Net additions to cash	**$1.19**	**$317,497.43**
Electronic funds transfers	0.00	-62,975.00
Other subtractions	-271,548.68	-271,548.68
Net subtractions from cash	**-$271,548.68**	**-$334,523.68**
Closing value of cash and sweep balances	**$0.00**	

Income summary

		THIS PERIOD	THIS YEAR
TAXABLE	Money market/sweep funds	1.19	10.46
	Interest	0.00	32,746.97
	Total taxable income	**$1.19**	**$32,757.43**
	Total federally tax-exempt income	**$0.00**	**$0.00**
	Total income	**$1.19**	**$32,757.43**

Gain/loss summary

	THIS PERIOD REALIZED	THIS YEAR REALIZED
Short term (S)	0.00	0.00
Long term (L)	0.00	61,053.00
Total	**$0.00**	**$61,053.00**

WELLS FARGO ADVISORS

IUPAC
EURO BOND ACCT

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 3264-6780

Your Financial Advisor

Z201 ACAT REP
Phone: 800-359-9297

401 SOUTH TRYON STREET
CHARLOTTE, NC 28202

Client service information

Client service:	866-281-7436
Website:	www.wellsfargoadvisors.com

Account profile

Full account name:	IUPAC EURO BOND ACCT
Account type:	Standard Brokerage
Brokerage account number:	3264-6780
Tax status:	Non-Profit
Investment objective/Risk tolerance:*	MODERATE GROWTH & INCOME
Time horizon:*	LONG TERM (10+ YEARS)
Liquidity needs:*	NONE
Cost Basis Election:	First in, First out
Sweep option:	BANK DEPOSIT SWEEP

*For more information, go to www.wellsfargoadvisors.com/disclosures.

For your consideration

Go paperless. Accessing your account documents online is easy, secure, and costs nothing. Sign on to **wellsfargoadvisors.com** with your online access Username and Password, select **Statements & Docs**, and then click on the **Delivery Preferences** Quick Link. Choose **Electronic Delivery** to go paperless or select specific account documents for electronic delivery. If you do not have a Username and Password, visit **wellsfargoadvisors.com/signup** or call 1-866-281-7436 for enrollment assistance.

Document delivery status

	Paper	Electronic
Statements:	X	X
Trade confirmations:	X	X
Tax documents:	X	X
Shareholder communications:	X	X
Other documents:	X	X

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IUPAC
EURO BOND ACCT

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 3264-6780

Additional information

	THIS PERIOD	THIS YEAR
Gross proceeds	0.00	265,353.00

Activity detail

DATE	ACCOUNT TYPE	TRANSACTION	QUANTITY	DESCRIPTION	PRICE	AMOUNT	CASH AND SWEEP BALANCES
11/01				BEGINNING BALANCE			271,547.49
11/13	Cash	CHARGE		TERMINATION FEE		-95.00	271,452.49
11/14	Cash	INTEREST		BANK DEPOSIT SWEEP 111414 271,547.49000		1.19	271,453.68
11/18	Cash	ASSET TRF		TRANSFER CASH BALANCE		-271,453.31	0.37
11/20	Cash	ASSET TRF		TRANSFER CASH BALANCE		-0.37	0.00

Non cash activity detail

This section displays security transfer activity for the current period. The price and value are as of the date of the transfer.

Transfers out

DATE	ACCOUNT TYPE	TRANSACTION	QUANTITY	DESCRIPTION	PRICE	VALUE
11/18	Cash	ASSET TRF	-100,000.00000	ORANGE SA EURO MED TERM NTS SER 95 TRANCHE 1 DENOM=EUR CPN 4.750% DUE 02/21/17 DTD 02/21/07 FC 02/21/08 CUSIP F4113NEK1 TO: BB&T SECURITIES, LLC	137.4079	-137,407.90
11/18	Cash	ASSET TRF	-100,000.00000	HOLCIM FINANCE LUX SA EURO MEDIUM TERM NOTES DENOM=EUR CPN 4.375% DUE 12/09/14 DTD 12/09/04 FC 12/09/05 CUSIP L4806FAB7 TO: BB&T SECURITIES, LLC	125.5969	-125,596.90

WELLS FARGO ADVISORS

IUPAC
EURO BOND ACCT

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 3264-6780

Non cash activity detail continued

Transfers out

DATE	ACCOUNT TYPE	TRANSACTION	QUANTITY	DESCRIPTION	PRICE	VALUE
11/18	Cash	ASSET TRF	-100,000.00000	TORONTO-DOMINION BANK EURO MTN SER 08-02 DENOM=EUR TRANCHE 1 CPN 5.375% DUE 05/14/15 DTD 05/14/08 FC 05/14/09 CUSIP C89117AE2 TO: BB&T SECURITIES, LLC	128.4729	-128,472.90
11/18	Cash	ASSET TRF	-100,000.00000	ROYAL BK OF SCOTLAND PLC EURO MEDIUM TERM NOTES DENOM=EUR CPN 4.875% DUE 04/22/15 DTD 04/22/03 FC 04/22/04 CUSIP G7688AJ47 TO: BB&T SECURITIES, LLC	127.4140	-127,414.00
				Total Transfers out:		**-$518,891.70**

Cash sweep activity

Our Cash Sweep program allows you to earn a return on the idle cash balances in your account by automatically investing such balances into one of our cash sweep options. These 'sweep transactions' may represent a net amount for the day and occur on settlement date. The following section displays transfers into and out of your sweep option. Transactions displayed here are Transfer To, Transfer From and Reinvested Dividends and Interest. These transaction amounts are not included in your cash flow summary.

DATE	TRANSACTION	DESCRIPTION	AMOUNT
11/01		BEGINNING BALANCE	271,547.49
11/14	TRANSFER FROM	BANK DEPOSIT SWEEP	-271,547.49

DATE	TRANSACTION	DESCRIPTION	AMOUNT
11/30		ENDING BALANCE	0.00

IUPAC
EURO BOND ACCT

NOVEMBER 1, 2014 - NOVEMBER 30, 2014
ACCOUNT NUMBER: 3264-6780

Bank Deposits Through Teller

November 1 - November 30

Wells Fargo Bank, N.A. (Member FDIC) **Account number 4003405428** **Questions? Call us at 1-800-266-6263**

Deposits made in a bank branch on the last business day of the month will typically appear on your next statement.

DATE	TRANSACTION	DESCRIPTION	AMOUNT	BANK BALANCE
11/01		BEGINNING BALANCE		$0.00
11/30		ENDING BALANCE		$0.00

Specific instructions and disclosures

Income on non-reportable accounts
Your income summary is categorized into taxable and tax-exempt income based upon the securities that you hold. Please be aware that, since this is a 1099 non-reportable account, this income will NOT be reported to the IRS, but is being provided to you for informational purposes only.

Cost basis - To add or update information or modify your reporting options, please contact Your Financial Advisor.
This statement presents estimated unrealized or realized gains or losses for your information only. If acquisition or other information is not available, the gain/loss information may not be displayed and section and summary totals may not reflect your complete portfolio. Cost basis information is not verified by FCC or Wells Fargo Advisors and should not be relied upon for legal or tax purposes. Revisions to this information (due to corporate mergers, tenders and other reorganizations) may be required from time to time.

Cost basis for factored bonds (GNMA, CMO, etc.) will be adjusted for paydown of principal. Systematic investments in mutual funds and reinvested dividends for mutual funds and stocks have been consolidated for each position. Unit cost data for systematic investments and dividend reinvestment securities is provided for informational purposes only and is a non-weighted average.

Your account statement should not be used for tax preparation without assistance from your tax consultant. We do not report capital gains or losses for non-covered securities to the IRS.

Cost basis options
Unless specific tax lots are selected at trade time, sales of tax lots will occur using the cost basis election reflected in the Account profile section.

WELLS FARGO ADVISORS

Statement balancing guide

1 Record in your account register all items which may appear on this statement that have not previously been entered in your account register, such as ATM/Check Card transactions, automatic transfers, preauthorized drafts, interest earned, service charges, proceeds from sales, security purchases, etc.

2 In your account register, check off the additions and subtractions as shown in the Activity Detail Section.

3 In the Outstanding Additions section at the right (Section A), list any outstanding additions such as deposits, dividends and interest, proceeds from sales, etc., that have been made since the date of this statement.

4 In the Outstanding Subtractions section at the right (Section B), list any checks that have not yet been paid and any outstanding subtractions such as ATM/Check Card transactions and any margin interest, service fees and purchases, etc., that have been made since the date of this statement.

5 Write in the Closing Balance shown in the Cash flow summary. _____

6 Write in the total amount of Outstanding additions (Section A). +_____

7 Total the amounts in lines 5 & 6. =_____

8 Write the total amount of Outstanding Subtractions (Section B). -_____

9 Subtract the amount in line 8 from the amount in line 7. This is your **Adjusted Statement Balance.** =_____

A. Outstanding Additions

Date	Amount	
	$	
Total		

B. Outstanding Subtractions

Number	Amount	
	$	
Total		

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7. Investment Portfolio

2014 Summary of Wells Fargo EURO Account

2014	Purchase	Sell/Redeem	Div/Int	Deposits	Withdrawals	Prev. Value+ net purchases	Market Value (NIC)	Gain/(Loss)	Yield	
Jan	-	-	0	-	17,000	865,814	846,343	(19,470)	-2.25%	
Feb	-	-	6,519	-	-	846,343	864,565	18,222	2.92%	
Mar	-	139,021	6,910	-	-	725,544	722,919	(2,625)	0.59%	
Apr	-	-	6,737	-	12,475	722,919	725,581	2,662	1.30%	
May	-	-	7,375	-	-	725,581	713,039	(12,542)	-0.71%	
Jun	-	-	1	-	-	713,039	713,779	740	0.10%	
Jul				19,388	33,500	713,779	695,198	(18,581)	-2.60%	
Aug	-	-	(299)		-	695,198	682,540	(12,658)	-1.86%	
Sep			1			682,540	652,487	(30,053)	-4.40%	
Oct			1			652,487	791,363	138,876	21.28%	
Nov			1			791,363	-			
Dec	Assets Transferred to BB&T Nov. 18th, 2014									
Total	-	139,021	27,246	19,388	62,975	726,793	713,779	(13,014)	1.96%	14.37%

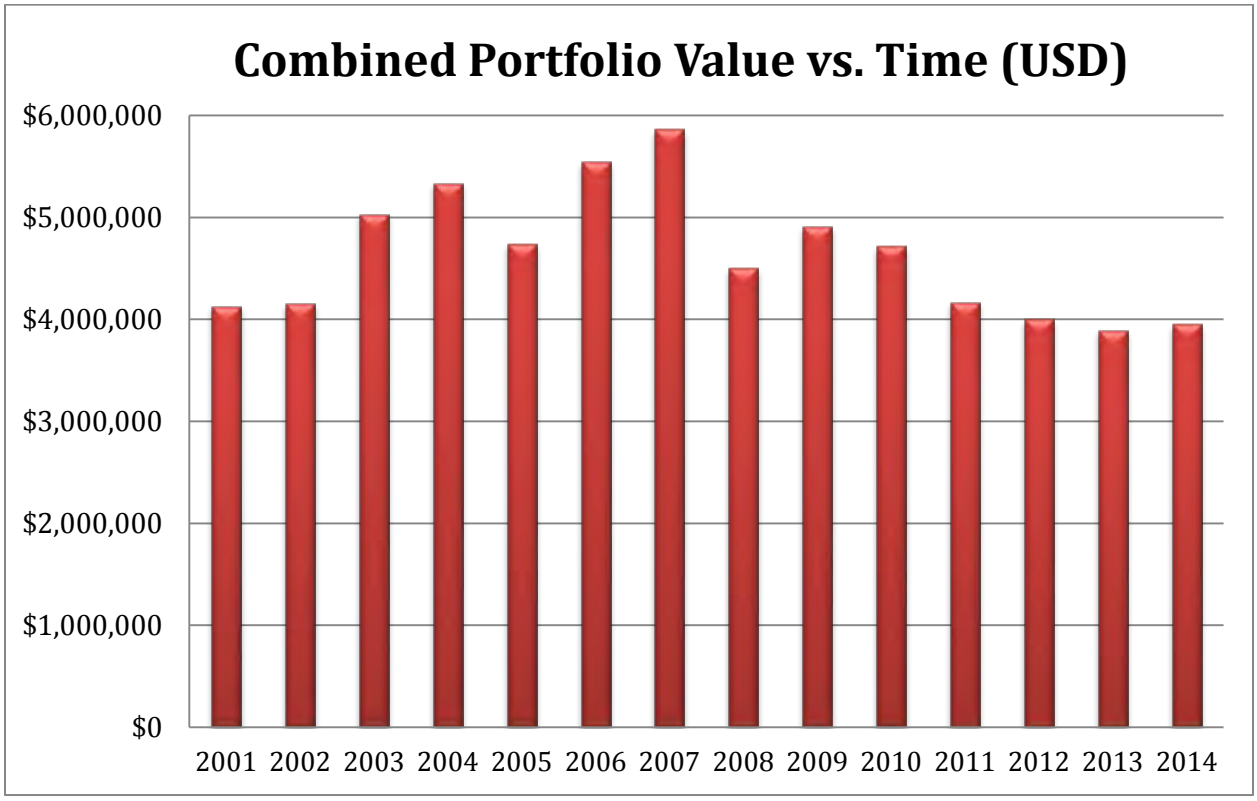
2014 Summary of Wells Fargo USD Account:

2014	Purchase	Sell/Redeem	Div/Int	Deposits	Withdrawals	Prev. Value+ net purchases	Market Value (NIC)	Gain/(Loss)	Yield	
Jan	-	-	3,250	-	33,000	3,031,265	2,992,104	(39,161)	-1.18%	
Feb	-	-	3,225	-	-	2,992,104	3,078,293	86,189	2.99%	
Mar	8,823	-	15,498	-	-	3,087,116	3,067,783	(19,333)	-0.12%	
Apr	-	-	2,525	-	13,208	3,067,783	3,078,254	10,471	0.42%	
May	-	-	5,125	-	-	3,078,254	3,118,085	39,831	1.46%	
Jun	6,895	-	15,395	-	-	3,124,980	3,143,867	18,887	1.10%	
Jul	-	-	3,250		19,400	3,143,867	3,098,025	(45,842)	-1.35%	
Aug	-	-	3,225	-	-	3,098,025	3,156,490	58,465	1.99%	
Sep	5,696		12,371		3,226	3,162,186	3,103,897	(58,289)	-1.45%	
Oct			9,201			3,103,897	3,137,498	33,601	1.38%	
Nov		-	5,125		3,135,110	3,137,498	-			
Dec	Account Balances were swept into BB&T accounts.									LMS
	21,414	-	78,356	-	3,203,944	3,052,679	3,103,897	51,218	4.24%	5.22%
			adj. from statement 11/30/2104							

7.2 Portfolio Performance 2014 (Closed Out Wells Fargo Accounts November 2014)

	2014			
	Investment Type	**Current Market Value**	**Annual Income**	**Annual Yield (%)**
USD				
	Corporate Bonds	1,207,762	52,100	4.31
	Foreign Bonds	115,967	6,500	5.61
	Total Fixed Income	1,332,569	58,600	4.40
	Preferreds/Fixed Rate	0	0	
	Mutual Funds	1,774,295	30,421	1.71
EURO				
	Corporate Bonds	140,000	4,750	3.39
	Foreign Bonds	695,197	23,750	3.42
	Government Bonds	0	0	
	Total Fixed Income	835,197	28,500	3.41
Combined		**3,933,221**	**117,521**	**2.99**
Combined Fixed-Rate Only		2,158,926	87,100	4.03

20.1.3 Combined Portfolio Value Over Time (USD)



Investment Policy Statement

9 February 2015

Prepared by:
C. Douglas Bray, CFP®
Certified Investment Management Analyst
Senior Vice President
BB&T Scott & Stringfellow

Edited by:

John Corish, IUPAC Treasurer
Lynn M. Soby, IUPAC Executive Director

Note: this document includes amendments added on 30th January 2015

PURPOSE

The purpose of this document is to identify a set of investment objectives and constraints, asset allocation parameters, performance measurement benchmarks, and guidelines for the International Union of Pure and Applied Chemistry (IUPAC) long term investments. The investment policy statement is intended to assure the Officers, Executive Committee and Bureau of IUPAC that reserve assets are being invested in accordance with the best long-term interests of IUPAC, given the following considerations:

- *IUPAC's risk tolerance or its willingness to withstand substantial losses due to adverse market conditions.*
- *IUPAC's need to obtain real, or inflation-adjusted, growth in its asset base.*
- *IUPAC's requirement for current income to support IUPAC programs and activities.*
- *IUPAC's liquidity requirements or its need to maintain adequate cash balances to accommodate share withdrawals from the long term portfolio when needed.*

INVESTMENT OBJECTIVES AND CONSTRAINTS

The primary objective of having reserve funds is to provide continuity in the programs set out in the IUPAC Strategic Plan regardless of short term financial discontinuities and disruptions. With this objective, the reserve funds must (1) provide protection for biennial operating expenses, (2) provide for periodic, planned extraordinary expenses in connection with General Assembly and Congress meetings held in regions of the world which would increase the normal expenses, and (4) support endowed programs of the organization. It is expected that under normal circumstances, the National Subscriptions plus other annual sources of operating income will cover normal operating expenses. These are fully in line with the IUPAC fund policy statement.

Purpose of This Investment Policy Statement

This statement of investment policy is set forth by the Finance Committee of IUPAC in order to:

1) Define and assign the responsibilities of all involved parties.
2) Establish a clear understanding for all involved parties of the investment goals and objectives of the long-term portfolio.
3) Offer guidance and parameters to all Investment Managers regarding the investment of the that portfolio.
4) Establish a basis for evaluating investment results.
5) Establish the relevant investment horizon for which that portfolio will be managed.
6) Comply with fiduciary, due diligence and legal requirements for that portfolio.

In general, the purpose of this statement is to outline a philosophy and approach which will guide the investment management of the assets toward the desired results. It is intended to be sufficiently specific to be meaningful, yet flexible enough to be practical.

DEFINITIONS

1. The "Fund" shall mean the assets of IUPAC.
2. The Finance Committee of IUPAC has executive authority with respect to the selection, transfer and sale of securities held by IUPAC, provided that the Treasurer of IUPAC concurs with its decision.
3. "Fiduciary" shall mean any individual or group of individuals that exercise discretionary authority or control over fund management or any authority or control over management, disposition or administration of the Fund's assets.
4. "Investment Manager" shall mean any individual or group of individuals employed to manage the investments of all or part of the Fund's assets.
5. "Investment Consultant" shall mean any individual or organization employed to provide advisory services, including advice on investment objectives and/or asset allocation, manager search, and performance monitoring.
6. "Securities" shall refer to the marketable investment securities which are defined as acceptable in this statement.
7. "Investment Horizon" shall be the time period over which the investment objectives, as set forth in this statement, are expected to be met. The objectives are based on a 10-year investment horizon, so that interim fluctuations should be viewed with the appropriate perspective. IUPAC has adopted a long-term investment horizon such that the chances and duration of investment losses are carefully weighed against the long-term potential for appreciation of assets.
8. "Benchmark" shall refer to the target index of the aggregate portfolio.
9. "Style Index" shall refer to the appropriate index of each individual manager based on investment style.

DELEGATION OF AUTHORITY

The Finance Committee of IUPAC is a fiduciary, and is responsible for directing and monitoring the investment management of the Fund's assets. As such, the Finance Committee is authorized to delegate certain responsibilities to professional experts in various fields. These include, but are not limited to:

1. *Investment Consultant.* The consultant may assist the Finance Committee in: establishing the investment policy, objectives and guidelines; selecting investment managers, reviewing such managers over time, measuring and evaluating investment performance; and other tasks as deemed appropriate.
2. *Investment Manager.* The investment manager has discretion to purchase and sell the specific securities that will be used to meet the Fund's investment objectives.
3. *Custodian.* The custodian will physically maintain possession of securities owned by the Fund, collect dividend and interest payments, redeem maturing securities, and effect receipt and delivery following purchase and sales. The custodian may also perform regular accounting of all assets owned, purchased, or sold, as well as movement of assets into and out of the Fund's accounts.
4. Additional specialists such as attorneys, auditors, and others may be employed by the Finance Committee to assist in meeting its responsibilities and obligations to administer the Fund's assets prudently.

The Finance Committee will not reserve any control over investment decisions, with the exception of specific parameters described in these statements. Managers will be held responsible and accountable to achieve the objectives herein stated. While it is not believed that the parameters will hamper investment managers, each manager should request modifications which they deem appropriate.

If such experts employed are also deemed to be fiduciaries, they must acknowledge such in writing. All expenses for such experts much be customary and reasonable, and will be borne by the Fund as deemed appropriate and necessary.

The Finance Committee recommendation to delegate authority to Branch Banking & Trust was approved by the Executive Committee during the 153rd Executive Committee meeting in Research Triangle Park, 7 November 2014.

ASSIGNMENT OF RESPONSIBILITY

Responsibility of the Investment Consultant

The Investment Consultant's role is that of a non-discretionary advisor to the Finance Committee of IUPAC. Investment advice concerning the investment management of the Fund's assets will be offered by the Investment Consultant, and will be consistent with the investment objectives, policies, guidelines and constraints as established in this statement. Specific responsibilities of the Investment Consultant include:

1. Assist in the development and periodic review of the investment policy statement.
2. Recommend hiring managers to implement the investment strategy of the Fund. This strategy shall be within the investment policy guidelines as set forth in this statement and as otherwise provided by the Finance Committee.
3. Monitor asset allocation among all asset classes and verify that allocations are within targets defined by this investment policy statement and approved by the Finance Committee.
4. Monitor the investment performance of the Fund and provide quarterly performance reports to the Finance Committee.
5. Report in a timely manner substantive developments that may affect the management of the Fund's assets.

Responsibility of the Investment Manager(s)

Each Investment Manager must acknowledge in writing it's acceptance of responsibility as a fiduciary. Acceptable forms of acknowledgement may be Form ADV or a prospectus on file with the Securities and Exchange Commission. Each Investment Manager will have full discretion to make all investment decisions for the assets placed under its jurisdiction, while observing and operating within all policies, guidelines, constraints, and philosophies as outlined in this statement. Specific responsibilities of the Investment Manager(s) include:

1. Discretionary investment management including decisions to buy and sell and to alter asset allocation within the guidelines established in this statement.
2. Reporting, on a timely basis, quarterly investment performance results.
3. Communicating any major changes to economic outlook, investment strategy, or any other factors which may affect the management of the Fund.
4. Informing the Investment Consultant regarding any qualitative change to the investment management organization. Examples include changes in portfolio management personnel, ownership changes, investment philosophy, investment process, etc.
5. Manager shall be authorized to vote on behalf of the Fund any proxies relating to securities held in the account.

GENERAL INVESTMENT PRINCIPLES

1. Investments shall be made solely in the interest of the beneficiaries of the Fund.
2. The Fund shall be invested with the care, skill, prudence, and diligence under the circumstances then prevailing that a prudent person acting in like capacity and familiar with such matters would use in the investment of a fund of like character and with like aims.
3. Investment of the Fund shall be so diversified as to minimize the risk of large losses.
4. The Investment Consultant may employ one or more investment managers of varying styles and philosophies to attain the Fund's objectives.
5. Cash is to be employed productively at all times, by investment in short-term cash equivalents to provide safety, liquidity, and return.

INVESTMENT MANAGEMENT POLICY

1. Preservation of Capital – Consistent with their respective investment styles and philosophies, investment managers should make reasonable efforts to preserve capital, understanding that losses may occur in individual securities.
2. Risk Aversion – Understanding that risk is present in all types of securities and investment styles, the Finance Committee recognizes that some risk is necessary to product long-term investment results that are sufficient to meet the Fund's objectives. However, the investment managers are to make reasonable efforts to control risk, and will be evaluated regularly to ensure that the risk assumed is commensurate with the given investment style and objectives.
3. Preservation of Purchasing Power- The Finance Committee acknowledges that in addition to a focus on risk aversion, that a secondary objective is to focus on maintaining purchasing power of the Fund and that, at times, this goal can conflict with the Risk Aversion goal as stated above.
4. Adherence to Investment Discipline- Investment managers are expected to adhere to the investment management styles for which they were hired. Managers will be evaluated regularly for adherence to investment discipline, and terminated if they are deemed to have significantly deviated from this style.

INVESTMENT OBJECTIVES

In order to meet its needs, the investment strategy of IUPAC is to emphasize total return; that is, the aggregate return from capital appreciation as well as dividend and interest income.

The objectives in the investment management of the Fund's assets shall be:

To achieve returns in excess 3% over the rate of inflation over the investment horizon in order to preserve purchasing power of the Fund's assets, while achieving a balanced return of current income and modest growth of principal. Risk control is an important element in the investment of the Fund's assets.

The investment goals above are the objective of the aggregate portfolio, and are not meant to be imposed on each investment account or strategy. The goal of each investment manager, over the investment horizon established in this statement, shall be to:

Meet or exceed the appropriate benchmark <u>on a risk-adjusted basis</u> after fees.

Specific investment goals and constraints for each investment manager, if any, shall be incorporated as part of this statement of investment philosophy

INVESTMENT GUIDELINES

As described in the Investment Advisory Agreement, the Investment Consultant implements this Investment Policy through investments in separate accounts, mutual funds, and other co-mingled, pooled asset portfolios.

Allowable Assets

1. Cash Equivalents
    a. Treasury Bills
    b. Money Market Funds
    c. Commercial Paper
    d. Repurchase Agreements
    e. Certificates of Deposit
2. Fixed Income Securities
    a. U.S. Government and Agency Securities
    b. Corporate Note and Bonds
    c. Mortgage Backed Bonds
    d. Preferred Stock
    e. Fixed Income Securities of Foreign Governments and Corporations
    f. Floating Rate Debt
    g. Planned Amortization of Class Collateralized Mortgage Obligations (PAC CMO's) or other "early tranche" CMO's
    h. Asset backed bonds
3. Equity Securities
    a. Common Stocks
    b. Convertible Notes and Bonds
    c. Convertible Preferred Stocks
    d. American Depository Receipts (ADR's) of Non-U.S. Companies
    e. Stocks of Non-U.S. Companies
4. Mutual Funds & Exchange Traded Funds (ETF's)
    a. Mutual funds and ETF's which invest in securities as allowed in this statement.
5. Alternatives
    a. Real estate
    b. Master Limited Partnerships (MLP's)
    c. Hedge Funds
    d. Private Equity
    e. Venture Capital
    f. Commodities
6. Other
    a. GIC's (Guaranteed Insurance Contracts)

Asset Allocation Guidelines

Investment management of the assets of the IUPAC shall be in accordance with the following asset allocation guidelines:

1. Aggregate the Fund's Asset Allocation Guidelines (at market value)

Asset Class	Range	Target Weight
Global Equities	40% - 60%	50%
Global Fixed Income	15% - 45%	40%
Alternatives	0% - 15%	10%
Cash (excludes manager cash)	0% - 10%	0%

2. The Finance Committee may employ investment managers whose investments disciplines require investment outside the established asset allocations guidelines. Such investment managers will receive written direction from the Finance Committee regarding specific objectives and guidelines.
3. In the event that any individual Investment Manager's portfolio is in violation of specific guidelines, for reasons including but not limited to market price fluctuations, the Finance Committee expects that the Investment Manager will bring the portfolio into compliance with these guidelines as promptly and prudently as possible without instruction from the Finance Committee.

Diversification

Fund assets shall be invested with the intention of minimizing the risk of large losses. Consequently, while individual managers/funds will be selected on their individual merits, it is imperative that the various asset classes and managers complement each other to provide balance and diversification that serves to minimize the Fund's volatility. Therefore, overlapping strategies should be avoided.

Equities

Equities shall mean common stocks, convertible securities, preferred stocks, index funds, warrants, rights, and American Depository Receipts (ADR's).

Fixed Income Investments

Fixed income securities shall include: U.S. Treasuries and Agencies, U.S. and Yankee Corporate bonds, International Non-Dollar bonds, Mortgage Pass-through securities (GNMA, FNMA, FHLMC, Savings & Loan, Banks), Collateralized Mortgage Obligations (CMO's), Asset-Backed Securities, Floating Rate Debt Instruments, Collateralized Bond Obligations, Eurodollar securities of US and foreign issuers, U.S. Preferreds and Non-Convertible Adjustable Rate Preferreds.

The fixed income asset class must be invested principally in fixed income securities that are rated investment grade or better (Baa and/or BBB) or better at purchase. Below investment grade securities are permissible but may not constitute more than 30% of the fixed income allocation without written acknowledgement from the Finance Committee. The Fund may also invest in investment and non-investment grade debt securities of issuers in emerging market countries.

Except for the U.S. Government, its agencies or instrumentalities, no more than 5% of the fixed income portfolio at cost, or 10% at market value, shall be invested in any one single guarantor, issuer, or pool of assets. In addition, managers are expected to exercise prudence in diversifying by sector or industry.

Alternatives

Alternative investment strategies are defined as investment programs that offer the portfolio access to strategies that have low correlation to traditional asset classes, such as long only equity and fixed income markets. The purpose of using alternative investment strategies is to reduce the volatility of the overall portfolio and provide an alternative source of return. Only alternative investments that are registered under the Investment Advisors Act of 1940 ("40-Act Funds") and regulated by the Securities and Exchange Commission can be considered by the Fund.

Cash Equivalents

The manager may invest in commercial paper, Treasury Bills, certificates of deposit, and money market mutual funds to provide income, liquidity for expense payments, and preservation of the Fund's principal value. All such assets must represent maturities of one year or less at the time of purchase. Commercial paper assets must be rated A-1 or P-1. The manager may not purchase short-term financial instruments considered to contain speculative characteristics (uncertainty of principal and/or interest).

INVESTMENT MANAGER PERFORMANCE REVIEW AND EVALUATION

Performance reports generated by the Investment Consultant shall be compiled at least quarterly and communicated to the Finance Committee for review. The investment performance of total portfolios, as well as asset class components, will be measured against commonly accepted performance benchmarks. Consideration shall be given to the extent to which the investment results are consistent with the investment objectives, goals, and guidelines as set forth in this statement. The Finance Committee intends to evaluate the portfolio over at least a three year period, but reserves the right to terminate a manager for any reason including the following:

1. Investment performance which is significantly less than anticipated given the discipline employed, market conditions, the risk parameters established, or unacceptable justification of poor results.
2. Failure to adhere to any aspect of this statement of investment policy, including communication and reporting requirements.
3. Significant qualitative changes to the investment management organization.
4. A change in the Fund's investment policy.

Investment managers shall be reviewed regularly regarding performance, personnel, strategy, research capabilities, organizational and business matters, and other qualitative factors that may impact their ability to achieve the desired investment results.

INVESTMENT POLICY REVIEW

To assure continued relevance of the guidelines, objectives, financial status and capital markets expectations as established in this statement of investment policy, the Finance Committee plans to review the investment policy statement at least annually.

This statement of investment policy is adopted on February 16, 2015
by the Finance Committee of IUPAC whose names appear below.

Dr. Christoph Buxtorf (Chair)

Prof. Dr. Wolfram Koch

Dr. Nobuyuki Kawashima

Dr. Pat N. Confalone

Prof. John Corish (Treasurer)

Signature: _____

Dr. Lynn Soby (Executive Director)

IUPAC Finance Committee Meeting

10th February 2014

Minutes

Members Present: Dr. Christoph F. Buxtorf (Chair), Dr. Pat N. Confalone, Prof. John Corish, Prof. Wolfram Koch, Dr. Nobuyuki Kawashima.

Guest: Dr. Mark Cesa, President.

1. INTRODUCTORY REMARKS & FINALIZATION OF AGENDA

Dr. Buxtorf welcomed those present to the meeting, especially the President and the new member Dr. Confalone, and thanked Reber Rechtsanwälte for the excellent arrangements and facilities. He reported that unfortunately Dr. Terry Renner, former Executive Director, would be unable to attend the meeting because of a recent illness and he thanked Dr. Renner and the Treasurer for the excellent work that they had done putting the Detailed Agenda and Agenda Book together for the meeting. All present joined in sending their best wishes for a speedy recovery to full health to Dr. Renner. The Treasurer reported that Dr. Renner would be contactable by telephone and available if required through the meeting.

Dr. Buxtorf suggested that in view of the rather difficult year that had passed it would be helpful to first hold a broad discussion on the financial situation and the general state of the Union before delving into the Agenda items. The Treasurer reported that there had been problems during 2013 with the accounting processes at the Secretariat that these had eventually resulted in a contamination of the QuickBooks software package used. Indeed outside IT assistance had been required to correct these problems which had led to unreliable results being produced. This as well as other failures in procedures had greatly delayed matters and the year-end Financial Report for 2013 prepared by Leslie Davis and usually available for the Finance Committee meeting would not now be ready until later in February. The resignation of the Executive Director appointed to take over in January after such a short time had effectively highlighted the vital importance of the ED in the financial affairs of the Union. Dr. Buxtorf confirmed this from the perspective of the Finance Committee. The Treasurer reported that the absence of financial control at the Secretariat had aggravated spending beyond the budget provisioned in a number of areas, especially on the General Assembly, and it would emerge that it had been necessary to use a considerable sum of money from the investment portfolio to pay for this, for other overspends and for day to day operations.

The President outlined the steps that he had taken to allow the Secretariat to continue to function in the interim before the appointment of a new Executive Director. A system had been put in place that divided the essential duties between the two most senior staff and each staff member was also assigned to an appropriate officer who would provide advice and support as required. The President and Colin Humphris, a member of the Executive Committee requested by the President to recommend actions to improve the operations at the Secretariat, had visited the Secretariat during the previous week and had further progressed the appointment of a new Executive Director by preparing a job description, and interviewing executive search firms with a view to their possible use in the

appointment process which was now, after considerable preparative work including an outside review, ready to commence.

The Treasurer summarized how the budget for the 2014/2015 biennium which would be considered later had been drawn up and agreed by Council. He reported that the audit of the 2013 outturn would commence in March and that in anticipation of that audit and with the agreement of our auditors he was currently providing the second signature – in addition to that of the Accounting Manager – on all expenditures.

There were no changes to the Agenda.

2. MINUTES OF 2013 MEETING

There were no comments on the minutes of the 2013 meeting. They were accepted as written and distributed. The Treasurer drew the attention of members to the fact that the expectation of the expense of the General Assembly had been noted in the minutes as had the failure to find suitable bonds in which to reinvest matured funds. These considerations had led to a decision to hold sufficient liquidity for the remainder of that year.

3. FINANCE COMMITTEE MEMBERSHIP

Prof. Corish reported that the terms of service of the current members were as follows:

Dr. Christoph Buxtorf, 2012-2015 (Second Term);
Prof. Dr. Wolfram Koch, 2012-2015 (Second Term);
Dr. Nobuyuki Kawashima, 2012-2015 (First Term); and
Dr. Pat Confalone, 2014-2017 (First Term, New Member).

The Treasurer and the Executive Director of IUPAC are *ex officio* members of the Finance Committee without voting power.

Dr. Buxtorf drew attention to the need to appoint a new Chairman and recruit a new member for 2016 to replace himself and Dr. Koch who would leave the Committee at that time having completed two terms.

4. ITEMS FROM MEETINGS OF EXECUTIVE COMMITTEE AND BUREAU

Dr. Buxtorf noted that the minutes of the most recent Executive Committee and Bureau meetings were, in contrast to the usual case, not in the Agenda Book. The President said that the minutes of the Bureau were almost ready and that there were no items that required consideration by the Finance Committee. Prof. Corish reported that one of the action items from the meeting of the Executive Committee was to initiate a systematic review of the project portfolio and terminate the projects recorded with a proposed end date prior to December 2013 and that had not spent any funds to indicate that they had been initiated.

5. FINANCIAL REVIEW

5.1. AUDITED ACCOUNTS – 2009

There were no comments on the Financial Statement for 2012 and the Auditors report thereon.

5.2. ACCOUNTANTS REPORT – 2012 AND 2013

There were no comments on the external Accountant's final report for the full calendar year 2012. Unfortunately, for the reasons reported earlier by Prof. Corish, it had not proved possible to complete the Accountant's report for 2013 in time for it to be included in the Agenda Book.

5.3. REVIEW OF EXPENSE VS. BUDGET – 2012-2013

Prof. Corish reported that there had been unusually high expenditures associated with the General Assembly in Istanbul with the total cost exceeding the planned budget of USD 325,000 by in excess of USD 100,000. The additional costs were for travel and subsistence since the costs for facilities had been less than those incurred for the previous General Assembly. The lack of financial control at the Secretariat had also resulted in overspends on other items, noticeably the Prize for Young Chemists, and unavoidable additional expenditures were incurred during the biennium in the search for and overlap of the new Executive Director. As a consequence the proceeds from matured bonds had been required to fund normal operations in both 2112 and 2013. These proceeds would normally have been reinvested after maturity.

The self-publication operation had returned income in line with expectations in 2013, cf. Section 5.5, but starting in January 2014 the publication of PAC and CI would be published by the De Gruyter publishing house following the signing of agreements aimed at stopping the decline in income and increasing circulation. These new arrangements would have major consequences for our cash-flow starting in 2014. Prior to this the subscriptions for PAC, which even with the substantial decrease in sales evident in the latter years amounted to at least USD 600,000 annually, had been collected by the Secretariat during the last two months of each year. The publication costs, on the other hand, were spent only gradually over the following twelve months and this resulted in there being a substantial 'cushion' in place to sustain any cash-flow difficulties that might arise due to the tardy receipt of National subscriptions or other income. These subscriptions were now going directly to De Gruyter. This problem had been foreseen and an up-front payment negotiated in the contract but even this might not be sufficient to avoid difficulties. Whereas the cash currently in our operational account was sufficient it was not possible to be predict whether or at what time cash-flow problems requiring use of our reserves might arise during the year ahead because this depended on the rate of receipt of National subscriptions, which is beyond our control, and the rate and extent of our expenditures.

Consideration of these factors led to a comprehensive and wide ranging discussion by members on how best to manage within the budget available to us as well as how we might improve our ability to generate new additional income. The Committee examined each of the three principal streams currently producing income, National Subscriptions, Publishing Operations and our Investment Portfolio along with the main areas in which our expenditures occurred. During these discussions members made use of a series of graphs available in the Agenda Book (prepared for Section 9 below) which illustrated the rates at which our three revenue streams were changing with time since 2008 and, where feasible, with predictions up to 2015. A comparison of the resultant combined revenues with expenditures up until 2012 was also made but, as has been previously noted, the outturn for the 2103 expenditure was not available. It was, however, likely to follow the recent trend for years in which a General Assembly was held and so to exceed the annual income for that year.

The following series of decisions and suggestions followed from these discussions.

1. Control of its expenditures was the only financial factor over which the Union had complete control. Particularly during the biennium just commenced the Union should exercise maximum financial restraint and reserve its funds wherever possible.
2. The project system should be examined and consultations held with Division Presidents and Chairs of Standing Committees to seek their advice as to how projects might be carried out more economically. It was necessary to be able to exercise control over budget expenditures and to halt projects if necessary.
3. Economies should also be sought in administration costs with the present changes at the Secretariat providing an opportunity for review.
4. The organization of the General Assembly should be timetabled to economise on the length of time for which members were required to attend and make other savings.
5. The Union should adopt a more aggressive stance in its investment policy and set an objective of a 6% annual return after all costs had been paid. Capital preservation and risk tolerance considerations should remain part of our policy.
6. The Finance Committee should begin negotiations with firms that provide financial expertise to arrange that our portfolio be actively managed in future. In current market conditions this was likely to require a change to increase the ratio of equities to bonds in the holding.
7. The basis on which the National Subscriptions are calculated should be re-examined to ensure that it is equitable and a value proposition prepared for our present NAOs and to attract prospective new members.
8. That the outcome of the new publishing arrangements be carefully monitored over the coming years. The Committee noted that the contract could be terminated after three years if it proved to be unsatisfactory for either party.

5.4 RESERVES AND SPECIAL FUNDS

A table summarizing the Reserve Funds and Special Funds was not available for inclusion in the Agenda Book. The Finance Committee agreed to the request to set rate to be used for Special Funds for 2014. This decision was assisted by a table of annual income and yield by investment type included in the Agenda Book. In 2013, the average income from bonds denominated in USD was 4.43%, while the average income from bonds denominated in both USD and EUR was 3.98%. The interest rate for Special Funds was therefore set at 4% for the year 2014.

In reaching this decision the tables of Annual Income and Annual Yield by Investment Type for the years 2010 to 2013 inclusive included in the Agenda Book were examined in detail and the meeting accepted that the returns on equities for 2013 had been in line with market norms for that year.

5.5 FINANCIAL RESULTS FOR THE SELF-PUBLISHING OF PAC AND CI IN 2013

The Agenda Book contained a detailed updated financial summary for *PAC* and *CI*. During *2013 PAC* remained a source of net income for IUPAC, but this revenue exhibited the same steady decline that had been evident in each of the preceding years due to the ongoing decrease in the number of institutional subscribers and the switchover of many from print to the lower-cost E-only subscription. *CI* generates an ongoing annual net cost. The total cost of production of *CI* had remained relatively constant at about USD 172,000 per year since 2008. For 2013 the net income from publication of *PAC* and *CI* was approximately USD 133,600.

As mentioned above the Executive Committee had in 2013 taken the decision to partner with an established outside scientific publishing house, DeGruyter of Berlin, Germany, for the production of both publications. The Committee noted that the actual partnership and final transfer of operations to DeGruyter had become effective as of 1 January 2014, after a preparatory transition period during 2013.

6. NATIONAL SUBSCRIPTIONS

6.1. 2013 NATIONAL SUBSCRIPTION PAYMENT STATUS

The Treasurer reported that as of 14 January 2014, National Subscription payments from 12 NAOs were overdue, amounting to USD 103,554 in missing revenue for the year 2013. The Secretariat is pursuing payment from these NAOs, among which most have indicated that they intend to make payment in the first quarter of 2014. Indeed some had been received since the detailed Table in the Agenda Book giving details had been drawn up.

6.2 2014 NATIONAL SUBSCRIPTION PAYMENT STATUS

The Treasurer reported that as of 17 January 2014, 11 NAOs have already paid their

National Subscriptions for 2014. The details of the total amount paid by these members, USD 98,946, was available in a Table in the Agenda Book for details: again some additional subscriptions had been received since this Table had been drawn up.

Dr. Kawashima asked how the National Subscriptions were calculated saying that it seems as if excessive burdens were being placed on countries that were substantially developing their chemical outputs. It was agreed that the basis on which the calculations were made should be re-examined to ensure that it was as equitable as was possible. Dr. Confalone stated that in addition to having a mission statement and a vision the Union also needed a value proposition which could be used to answer frequently posed questions as to what benefits ensued from membership and to attract new members. The President said that this question was one of those being examined in the strategy review that was currently under way.

7. INVESTMENT PORTFOLIO

7.1. INVESTMENT TRANSACTION HIGHLIGHTS 2013

The Treasurer stated that the calendar year 2013 closing statements for our two investment accounts were included in the Agenda Book. As was our standard practice, dividends received from mutual funds were reinvested, while interest received on bonds was used for operations. Major investment transactions for 2013 are summarised in the table below:

Date	Activity	Description	Net Amount (USD)
15-Jan-13	Redemption	Federal Home Loan Mortgage Corp	133,125
15-Feb-13	Redemption	General Electric Capital Corporation	125,000
18-Mar-13	Purchase	Mutual Fund Dividend Reinvestment	5,364
08-May-13	Redemption	JP Morgan Chase 5.875%	150,000
17-Jun-13	Purchase	Mutual Fund Dividend Reinvestment	6,601
23-Sep-13	Purchase	Mutual Fund Dividend Reinvestment	5,401
27 Dec-13	Purchase	Mutual Fund Dividend Reinvestment	22,528

Investment portfolio transactions for 2012 are itemized in the table below:

Date	Activity	Description	Net Amount (USD)
17-Jan-12	Redemption	Credit Suisse Global Notes	100,000
15-Feb-12	Sale	Fidelity Overseas Europe Fund	200,817
15-Feb-12	Sale	Fidelity Europe Capital Appreciation	123,679
15-Feb-12	Sale	Growth Fund of America	231,966
15-Feb-12	Sale	T. Rowe Price International Funds	87,293
15-Feb-12	Purchase	Income Fund of America	231,966
17-Feb-12	Redemption	DEPFA ACS Bank	129,906
17-Feb-12	Purchase	AT&T Senior Unsecured	101,052
17-Feb-12	Purchase	Procter & Gamble Senior Unsecured	149,425
19-Mar-12	Purchase	Hewlett Packard Unsecured	100,645
19-Mar-12	Purchase	Mutual Fund Dividend Reinvestment	5,020
14-Jun-12	Purchase	Mutual Fund Dividend Reinvestment	6,296
27-Aug-12	Redemption	Citigroup Inc. Subordinated Notes	100,000
24-Sep-12	Purchase	Mutual Fund Dividend Reinvestment	5,150
26-Dec-12	Redemption	Wyeth Notes	101,141
27-Dec-12	Purchase	Mutual Fund Dividend Reinvestment	16,490

Summary of Transactions by Type Combined for 2012 and 2013:

Transaction Type	Number of Transactions	Net Amount (USD)
Redeem Bond	7	839,172
Sell Mutual Fund	4	643,755
Purchase Bond	3	351,122
Purchase Mutual Fund	9	304,816
Total Redeem/Sell	11	1,482,927
Total Purchase	12	655,938
Net Cash for Reinvestment		**826,989**

The Treasurer reported that during the 2012-2013 biennium, IUPAC's Wells Fargo Investment Advisors regularly monitored the market for suitable opportunities to reinvest the excess cash from bond redemptions and mutual fund sales. Unfortunately, only three such identified opportunities resulted in the actual purchase of new bonds. Due to continuously declining revenues from publications and investment interest and higher than previously budgeted expenses, essentially

all of the USD 826,989 had eventually been used for operations of the Union during the biennium.

7.2. PORTFOLIO PERFORMANCE 2013

Tables summarising the changes in the investment portfolio as well as the distribution of the portfolio by investment type were provided in the Agenda Book. The meeting noted that the average yield for the portfolio in 2012 was 11.4%, a decline of 0.8% relative to 2012. A chart showing the value of the combined portfolios versus time since the year 2001 is also included in the Agenda Book.

7.3. REVIEW OF INVESTMENT PERFORMANCE AND STRATEGY

The Treasurer reported that the ratio (based on USD value) of equities to bonds in the portfolio for 2012 was about 44 to 56, compared with the 34 to 66 ratio of the previous year. In 2013 the ratio of US to non-US equities was 58 to 42 and the ratio of US to non-US fixed-rate investments was 64 to 36.

An annual review of the investment portfolios with Mr. Guy Guidry (IUPAC's advisor from Wells Fargo Investment Advisors) normally scheduled at the Secretariat in January of each year had not taken place in 2013 and was not scheduled for 2014 because of the vacancy in the Executive Director position. The purpose of the review is to assess past performance and to identify new ways to improve the overall yield of the investments that are held. It has been difficult to find high-quality bonds to replace those that have matured during the past two years. Yields on new corporate bonds are now far less than half of what was earned from the bonds that have been redeemed.

7.4. UPDATE OF INVESTMENT AND FUND STRATEGIES

The current Investment Policy Statement and Fund Policy Statement which date back, respectively, to 2005 and 2003, and which had been adopted by the FC committee in previous meetings were in the Agenda Book. Following discussions it was decided that these statements should be revised as in some aspects they had become outdated and are in part irrelevant to the current financial environment. However this revision was postponed until after decisions had been taken as to the optimum investment policy had been worked out after discussions with financial advisors. The revision will be carried out by the Chairman, Dr, Buxtorf and the Treasurer.

8. REVIEW OF APPROVED BUDGET FOR 2014 - 2015

The Treasurer reported that at the start of 2013 several budget proposals had been developed for the upcoming biennium 2014-2015. The ultimate objective was to develop a realistic budget for presentation to and approval by the IUPAC Council at the General Assembly in Istanbul, Turkey, in August of 2013. To that end several possible scenarios were examined.

Scenario 1 was called the Status Quo budget. It remained essentially as the budget for the 2012-2013 biennium. That is, no increase in National Subscription revenue was assumed. Income from the investment portfolio and from publication of our journals was estimated based on historical data through 2012. This budget projected a deficit of USD 608.3K for the new biennium.

Scenario 2 was called the E-only budget. In this case, it was assumed that both *PAC* and *CI* would be published only in electronic format, thus saving sizable printing and distribution costs. In the end, this budget would, if adopted, have resulted in a biennial deficit of USD 388.3K.

Scenario 3 was called the De Gruyter budget. In this case the assumption was made that IUPAC would enter into a publication partnership with the De Gruyter publishing house of Berlin, Germany. De Gruyter would guarantee IUPAC an income stream (at least for the first three years of the agreement), collect the subscription revenue for *PAC*, and carry the costs of publication. IUPAC would continue to send free copies of *CI* to sponsored conferences. This budget would also have resulted in a biennial deficit of USD 506.9K.

Scenario 4 was called the De Gruyter with no *CI* budget. Again it was assumed that De Gruyter would publish our journals, but we would not send any free copies of CI to sponsored conferences. Even though the savings would be significant, the biennial deficit would still have been USD 438.5K.

Due to significantly reduced revenues from investments and from publications, as was evident in realistic predictions made from updated best estimates, it was not possible to produce a balanced budget for any of the original four scenarios.

To produce a balanced budget, a fifth scenario (Balanced Budget) was developed for consideration with additional input from the officers. This case involved a number of assumptions, all of which were fully annotated in the Agenda Book. Funding allocated for Divisional and Standing Committee budgets was reduced by 12% overall. Budgets for the Project Committee and for funding scientific conferences (FSC) were also reduced. Additionally, it was assumed that National Subscriptions for NAOs would be increased by 3% each year of the new biennium with respect to the levels in 2013.

It was possible with these changes to develop a balanced budget for 2014-2015. However, this result was achieved only by reducing expenditures significantly across a broad range of normal activities. It was deemed to be the best option for IUPAC at this time. The balanced budget was presented to the IUPAC Council in Istanbul as required by the Statutes and Bylaws and the budget was ratified by Council without amendment. It requires that in the current biennium IUPAC manages its financial resources very carefully and seeks to develop new sources of additional operating revenue. The Committee noted the budget as adopted by the Council a copy of which was in the Agenda Book. Given the financial situation it regarded the budget as a step in the right direction although it might be necessary to implement more radical changes in the future.

9. FUNDING STRATEGIES AND NEW SOURCES OF INCOME

The Committee reviewed the income and expenditures over time as displayed in a set of graphs prepared for the purpose and shown in the Agenda Book. The overall income from National Subscriptions could not reasonably be increased by more than the rate of inflation: a number of countries were already finding it difficult to meet their payments. As argued earlier, Section 6.2, a review of the method of calculation of these contributions to ensure their equity would be undertaken. The income earned from investments could be increased if a more aggressive policy was adopted and the portfolio was entrusted to expert investment advisors for active management. The Committee suggested an aspirational target of a 6% yield *per annum* after all charges. The ratio of securities to bonds would likely have to be increased to better profit from current market conditions. This objective was unlikely to be attained immediately and the Committee noted the need to preserve our capital and control the levels of risk to which our funds were exposed. The outcome of the outsourcing of our publications would require stringent monitoring to maximise the return from De Gruyter. The single factor over which we had direct control was our expenditure and this must be minimised in as far as was possible to prevent the necessity for more damaging cuts in the future.

The opportunities to develop new sources of income were limited as we had to exercise care not to come into competition with the National and Regional Associations on whom we relied for membership and goodwill. IUPAC should seek to develop better relationships with the Chemical Industry and to seek sponsorship for such activities as the World Chemistry Leadership Meeting (WCLM) at our General Assembly. It might also be feasible to seek secondment of potential senior executives from industry to act as our Executive Director. IUPAC could also examine the opportunities to organise meetings on emerging topics with expert speakers from industry.

10. ANY OTHER BUSINESS

There was no other business

11. DATE AND LOCATION OF NEXT MEETING

The date of the next meeting was set for 16th February 2015 at the offices of Reber Rechtsanwälte in Zurich.

2015 IUPAC Finance Committee

Monday, 16 February 2015, 09:00 – 17:00 Hours
Offices of Reber Rechtsanwälte, Utoquai 55
CH-8034 Zürich, Switzerland
Minutes

Members Present: Dr. Christoph F. Buxtorf (Chair), Prof. John Corish, Prof. Wolfram Koch, Dr. Nobuyuki Kawashima, Dr. Lynn M. Soby

Lunch Discussion: Dr. Pat N. Confalone via remote access

1. INTRODUCTORY REMARKS & FINALIZATION OF AGENDA

Dr. Buxtorf welcomed those present at the meeting, and Dr. Pat Confalone who will join by phone during lunch and thanked Reber Rechtsanwälte for the excellent arrangements and facilities. He thanked Dr. Soby, Executive Director and the Treasurer for the excellent work that they had done putting the Detailed Agenda and Agenda Book together for the meeting. All present joined in their appreciation of the work.

Dr. Buxtorf suggested that in his view the pressing item of discussion should be the new Investment Policy given the change IUPAC has made with the Investment Portfolio in November 2014. He thanked the Treasurer and Executive Director for their assistance with developing the proposals for review and decision to recommend BB&T/Scott & Stringfellow. The Treasurer commented that the Finance Committee's time and attention regarding the 2016-2017 budget was very important and he wanted to insure there was enough time for the discussion. This was reinforced by the Executive Director.

There were no changes to the Agenda.

2. MINUTES OF 2014 MEETING

The minutes of the 2014 Finance Committee were approved unanimously without changes. Dr. Buxtorf thanked Prof. Corish for his attending to the minutes in the absence of an Executive Director last year.

3. FINANCE COMMITTEE MEMBERSHIP

The terms of service of the current members are as follows:

Dr. Christoph Buxtorf	2012-2015 (Second Term, retiring)
Prof. Dr. Wolfram Koch	2012-2015 (Second Term, retiring)
Dr. Nobuyuki Kawashima	2012-2015 (First Term, eligible for re-election)
Dr. Pat Confalone	2014-2017 (First Term)

The Treasurer and the Executive Director of IUPAC are *ex officio* members of the Finance Committee without voting power. The current Treasurer will retire at 31/12/2015. Dr. Buxtorf drew attention that the Chair of the Finance Committee would be vacated at the end of his term (2015) and recommendations for his replacement be sent directly to the President for consideration. In addition, Prof. Dr.

Koch will also complete his term and recommendations for a replacement on the committee should also be suggested via email to the President. There will also be a change in Treasurer for 2016-2019, due to Professor Corish's retirement at the end of his service. A discussion ensued with Dr. Kawashima asking questions regarding the affect, if any, on Finance Committee members and their responsibilities and liabilities. Dr. Soby discussed the legal status of IUPAC in Switzerland.

[Action: *Dr. Soby to review and send current documents regarding IUPAC legal status and additional information relevant to his concerns and requests]*

Chairman Buxtorf clearly stated to the Finance Committee members to forward their recommendations directly to the President, Mark Cesa, for consideration of new members and Chairperson for 2016-2107.

4. ITEMS FROM MEETINGS OF EXECUTIVE COMMITTEE AND BUREAU

Dr. Buxtorf noted that the minutes of the two most recent Executive Committee Meetings and draft minutes of the Bureau were included in the Agenda Book. There were no actions related to the Finance Committee at this time.

5. FINANCIAL REVIEW

5.1. AUDITED ACCOUNTS – 2013

A copy of the Financial Statement for 2013 and the Auditors' report thereon is in the Agenda Book. Dr. Soby noted that the financial on-site audit work for 2104 is scheduled for March 5 -12th and that documents are being sent for the audit from both the Secretariat and the accountant, Leslie Davis.

5.2. ACCOUNTANT'S REPORTS – 2013

A copy of the external Accountant's final report for the full calendar year 2013 is in the Agenda Book. The corresponding report for the calendar year 2014 is in preparation concurrently with the pre-Audit documentation. When completed, it will be distributed to the Finance Committee via email (as an appendix to the Agenda Book).

5.3. REVIEW OF EXPENSE VS. BUDGET

Up to the current date in the 2014-2015 biennium budget, the Division Total actuals are under spent by $241,974 while the Standing Committee Totals are under spent by $73,924. The Project Commitment Report and Project Report are included in the Agenda Book for further details.

	Commitments (Actual)	% of Total Budget (Guideline: 70 %)	Operations (Actual)	% of Total Budget (Guideline: 30 %)	Total Operations & Commitments (Actual)	Total Operations & Commitments (Budget)	Over/ (Under)	Per Cent Spent
Division I	$21,910	37.0%	$16,227	27.4%	$38,137	$59,200	-$21,063	64.4%
Division II	$14,940	30.7%	$14,867	**30.6%**	$29,807	$48,600	-$18,793	61.3%
Division III	$12,300	25.7%	$1,250	2.6%	$13,550	$47,900	-$34,350	28.3%
Division IV	$6,500	13.1%	$4,776	9.6%	$11,276	$49,700	-$38,424	22.7%
Division V	$18,500	34.7%	$6,890	12.9%	$25,390	$53,300	-$27,910	47.6%
Division VI	$12,500	20.9%	$9,737	16.3%	$22,237	$59,800	-$37,563	37.2%
Division VII	$29,700	54.2%	$12,789	23.3%	$42,489	$54,800	-$12,311	77.5%
Division VIII	$9,100	12.9%	$9,740	13.8%	$18,840	$70,400	-$51,560	26.8%
Total Divisions	$125,450		$76,276		$201,726	$443,700	-$241,974	45.7%

	Commitments (Actual)	Commitments (Budget)	Over/ (Under)	Operations (Actual)	Operations (Budget)	Over/ (Under)
CCE	$4,000	$20,000	-$16,000	$10,667	$35,500	-$24,833
COCI	$3,800	$20,000	-$16,200	$3,765	$37,000	-$33,235
CHEMRAWN	N/A			$17,921	$27,500	-$9,579
CPCDS	N/A			$12,403	$16,200	-$3,797
ICTNS	N/A			$1,020	$3,500	-$2,480
Total Committees	$7,800	$40,000	-$32,200	$45,776	$119,700	-$73,924

The summary below is the total commitment versus Budget, including the SOF, Project Committee and Financial Support for Conferences.

Summary	Commit.	Budget*	Over (Under)
Division and STC Projects Totals	133,250	350,590	(217,340)
Strategic Opportunities Fund	19,000	183,515	(164,515)
Project Committee	34,910	70,000	(35,090)
FSC	12,700	35,000	(22,300)
	199,860	639,105	(439,245)
External Funded	8,800		
Total Project Commitments (all sources)	208,660		

The Finance Committee expenses for 2014 were $18,595 versus 2014-2015 budget of $13,200. The Treasurer explained that this over spending is a result of contracting the former Executive Director, Terry Renner, for assistance with the 2014 Finance Committee meeting and travel. Also included in the actual spend figure was the cost associated with legal advice regarding IUPAC's legal standing in Switzerland and preparation of documents required. The operations of the Secretariat are under spent due to the open Executive Director position, one open position and 4 months of salary gained upon reduction of staff in August. Unusually high (one off) expenses were incurred in 3rd and 4th quarter due to IT infrastructure failures, computer failures and lack of security and implementation of back up procedures (both Website and internal systems).
Finance Committee reviewed the information and is aware of the over budget figures given the status of the Secretariat and the need of the Officers for clarification of Legal Status. No action was needed.

5.4. RESERVES AND SPECIAL FUNDS

The Executive Director reported that the IUPAC portfolio was changed over to an actively managed portfolio late November 2104. A summary of the

investment performance prior to the changeover is included in the Agenda Book (section 7.1). Up until the changeover, the average income from bonds denominated in USD was 4.40%, while the average income from bonds denominated in EURO was 3.41%. The overall average was 4.03%.Since inception, the BB&T Investment portfolio is estimated to return 3.62% of dividend and income. Capital appreciation is expected to be ~2.4% for a combined return of ~6.0%.

A percentage of **3.5%** was recommended for the Special Funds rate in 2015 given past performance and anticipated future returns.
A summary of the investment performance after changeover is included in the Agenda Book (section 7.2)

[Finance Committee unanimously approved the 3.5% return for the Special Funds Rate]

5.5. FINANCIAL RESULTS FOR *CI* AND *PAC* IN 2014

In 2014, CI was published for the full year with our partner, De Gruyter. Overall, IUPAC shares 50% of the Revenue, 50% of Production/Overhead costs and 100% of Distribution costs. The net loss for CI in 2014 was $40,593 (USD).

IUPAC Costs (USD)	**Total**	**IUPAC Payment**
Revenue	40,034	18,454
Production/OH Costs	83,484	41,742
Distribution Costs	18,868	18,868
Total		**79,064**
Net Loss for CI (Revenue-Cost	20,017	
	60,610	
2104 Net Loss for CI	**(40,593)**	

Looking ahead to 2015, it is anticipated that lower costs will result from De Gruyter's hire of staff to replace the freelancer. The Business plan reflects a slight increase in revenue, lower production costs and higher overhead costs (internal staff). The 2014 and 2015 business plans are included in the Agenda Book.

PAC Publication with De Gruyter for 2014 and Plan for 2015:

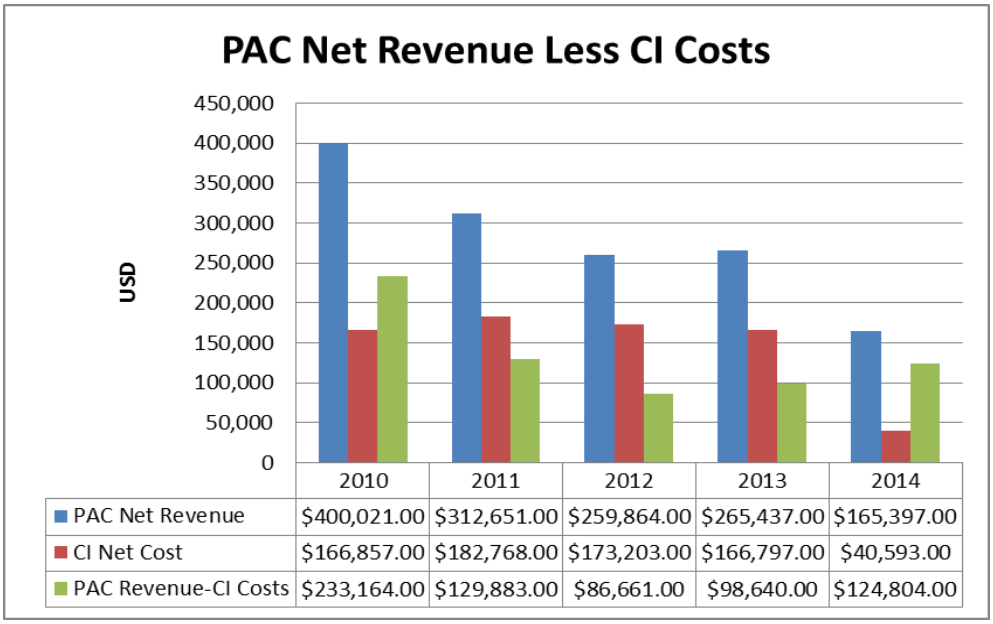
	2014	**2015**
	Euro	**Euro**
IUPAC Share	131,204	201,276
Advance Payment	(72,000)	(100,000)
IUPAC Year-end Payment	59,204	101,276
	as of 9/2014	

2014 Net IUPAC Publishing Revenue with De Gruyter:

PAC Net Revenue 2014: $165,397 (from est. 9/2014 Business Plan)

CI Costs 2014:	($40,593)
	$124,804

The comparison of PAC Revenue less CI Costs for the past 5 years is shown below. The overall Net Revenue in 2014 is approaching the 2011 value ($129,883)



	2010	2011	2012	2013	2014
PAC Net Revenue	$400,021.00	$312,651.00	$259,864.00	$265,437.00	$165,397.00
CI Net Cost	$166,857.00	$182,768.00	$173,203.00	$166,797.00	$40,593.00
PAC Revenue-CI Costs	$233,164.00	$129,883.00	$86,661.00	$98,640.00	$124,804.00

6. NATIONAL SUBSCRIPTIONS

6.1. 2014 NATIONAL SUBSCRIPTION PAYMENT STATUS

The Executive Director reported that as of 5 February 2015, National Subscription payments from 19 NAOs were overdue, amounting to USD $103,667 in missing revenue for the year 2014 (2014 Budget is $913,000). This number is significantly higher than last report (12) while the financial impact is similar. The Secretariat is pursuing payment from these NAOs, among which most have indicated that they intend to make payment in the first quarter of 2015. One country, Cyprus, has withdrawn from IUPAC ($~3,000 not paid) while 4 other NAO's were determined from statute S9.2 to be automatically removed from membership. See the Table in the Agenda Book for details.

6.2. 2015 NATIONAL SUBSCRIPTION PAYMENT STATUS

As of 5 February 2015, 11 NAOs have already paid their National Subscriptions for 2015. The total amount paid is USD $194,900 (2015 Budget is $940,500). The numbers are the same for 2014, while the value is

~$95,000 higher. See the Table in the Agenda Book for details.

7. INVESTMENT PORTFOLIO

7.1. INVESTMENT TRANSACTION HIGHLIGHTS 2014 AND 2013

The Executive Director reported that the Investment Portfolio was transferred in November 2104 to BB&T following a decision of the Executive Committee on advice from the Finance Committee – cf. item 8 below for details. The Agenda Book contains the 2014 closing statements for our two investment accounts at the time at which the transfer took place. As is our standard practice, dividends received up to that time from mutual funds were reinvested, while interest received on bonds was used for operations.

Investment portfolio transactions for 2014 are itemized in the tables below:

Wells Fargo EURO Account 2014

2014	Purchase	Sell/Redeem	Div/Int	Deposits	Withdrawals	Prev. Value+ net purchases	Market Value (NIC)	Gain/(Loss)	Yield
Jan	-	-	0	-	17,000	865,814	846,343	(19,470)	-2.25%
Feb	-	-	6,519	-	-	846,343	864,565	18,222	2.92%
Mar	-	139,021	6,910	-	-	725,544	722,919	(2,625)	0.59%
Apr	-	-	6,737	-	12,475	722,919	725,581	2,662	1.30%
May	-	-	7,375	-	-	725,581	713,039	(12,542)	-0.71%
Jun	-	-	1	-	-	713,039	713,779	740	0.10%
Jul				19,388	33,500	713,779	695,198	(18,581)	-2.60%
Aug	-	-	(299)		-	695,198	682,540	(12,658)	-1.86%
Sep			1			682,540	652,487	(30,053)	-4.40%
Oct			1			652,487	791,363	138,876	21.28%
Nov			1			791,363	-		
Dec	Assets Transferred to BB&T Nov. 18th, 2014								
Total	-	139,021	27,246	19,388	62,975	726,793	713,779	(13,014)	1.96%

Wells Fargo USD Account 2014

2014	Purchase	Sell/Redeem	Div/Int	Deposits	Withdrawals	Prev. Value+ net purchases	Market Value (NIC)	Gain/(Loss)	Yield
Jan	-	-	3,250	-	33,000	3,031,265	2,992,104	(39,161)	-1.18%
Feb	-	-	3,225	-	-	2,992,104	3,078,293	86,189	2.99%
Mar	8,823	-	15,498	-	-	3,087,116	3,067,783	(19,333)	-0.12%
Apr	-	-	2,525	-	13,208	3,067,783	3,078,254	10,471	0.42%
May	-	-	5,125	-	-	3,078,254	3,118,085	39,831	1.46%
Jun	6,895	-	15,395	-	-	3,124,980	3,143,867	18,887	1.10%
Jul	-	-	3,250		19,400	3,143,867	3,098,025	(45,842)	-1.35%
Aug	-	-	3,225	-	-	3,098,025	3,156,490	58,465	1.99%
Sep	5,696		12,371		3,226	3,162,186	3,103,897	(58,289)	-1.45%
Oct			9,201			3,103,897	3,137,498	33,601	1.38%
Nov		-	5,125		3,135,110	3,137,498	-		
Dec	Account Balances were swept into BB&T accounts.								
	21,414	-	78,356	-	3,203,944	3,052,679	3,103,897	51,218	4.24%
			adj. from statement 11/30/2104						

7.2. PORTFOLIO PERFORMANCE 2014

Portfolio Performance 2014 (Wells Fargo Accounts November 2014)

	2014			
	Investment Type	**Current Market Value**	**Annual Income**	**Annual Yield (%)**
USD				
	Corporate Bonds	1,207,762	52,100	4.31
	Foreign Bonds	115,967	6,500	5.61
	Total Fixed Income	1,332,569	58,600	4.40
	Preferreds/Fixed Rate	0	0	
	Mutual Funds	1,774,295	30,421	1.71
EURO				
	Corporate Bonds	140,000	4,750	3.39
	Foreign Bonds	695,197	23,750	3.42
	Government Bonds	0	0	
	Total Fixed Income	835,197	28,500	3.41
Combined		**3,933,221**	**117,521**	**2.99**
Combined Fixed-Rate Only		2,158,926	87,100	4.03

8. CHANGE IN MANAGEMENT OF INVESTMENTS

8.1 APPOINTMENT OF BB&T AS FINANCIAL ADVISORS

After detailed consideration and discussions with prospective service suppliers the Finance Committee in a statement dated 31st October 2104 recommended to the Executive Committee that a change be made to the union's investor and bank relationships. This recommendation is reproduced in full in the Agenda Book. This recommendation was approved and has been implemented. The December

2014 investment statements are in the Agenda Book. A summary of the Inception to Date of our investment portfolio, prepared by BB&T/S&S, is included in the Agenda Book.

8.2 UPDATED DRAFT OF IUPAC INVESTMENT POLICY STATEMENT

A draft of the new Investment Policy Statement in the Agenda Book was reviewed and approved by the Committee. This reflects the new arrangements that have been made for the management of the investment portfolio and for reporting of its performance to the Finance Committee.

8.3 IUPAC FUND POLICY STATEMENT

The current IUPAC Fund Policy Statement was included in the Agenda Book and was reviewed and amended by the Committee in line with the changes that had been highlighted.

8.4 FUTURE REPORTING AND REVIEW OF PORTFOLIO

It was agreed that our investment manager, Doug Bray, and the BB&T Investment Team will review progress with the Finance Committee at the end of each quarter and provide monthly summary reports to the Executive Director for distribution to the Finance Committee. Tentative schedules were set as the 1st week in April, 1st week in July, 1st week in September and end of year report in January 2016. If required, monthly investment statements can be sent to the Committee members for informational purposes. The Quarterly reviews will be done via Go To Meetings.

9. REPORT ON OPERATIONAL EXPENDITURES/SAVINGS FOR 2014

The Treasurer reported that the operational finances of the Union, particularly as reflected by the Secretariat had varied from those anticipated at the time when the budget for the current biennium was put in place. There have been extensive changes in the administrative staff with Dr. John Petersen, the former Executive Director, Mr. Paul LeClair and Mr. Bryan Pearson leaving the organization. At this time only one of these has been replaced: Dr. Lynn Soby was appointed as Executive Director on July 24th 2014. Of the officers Dr. Rene Deplanque resigned as Secretary General early in 2014 and Mr. Colin Humphris was subsequently appointed by the Bureau at Coimbra in April as Acting Secretary General. Despite these interruptions and the reduction in personnel all the essential operations have been carried out by the remaining staff and officers and all the financial obligations have been fulfilled, including a successful audit of the accounts for 2013.

The 2014 meeting of the Finance Committee had noted the decline in the income streams from our publishing operations and investment portfolio. The corrective actions recommended by the Committee in these and other areas have been implemented – cf. also item 12 below. In addition the new guidelines for the reimbursement of travel and subsistence expenses, which it is hoped will reduce expenditure in this area and eliminate the type of overrun evident at the General

Assembly in 2013, were introduced in January 2014 and are working well. Further improvements in the service to our volunteers in this regard are planned.
Expenses and costs additional to those set in the budget include an overrun at the General Assembly in 2013 some of which passed over into 2014, the costs of search and appointment of the Executive Director, the upgrade of our accounting software and processes, the move of the Secretariat to new office accommodation in January 2015 and the outsourcing of some IT functions following the resignation of Bryan Pearson. Savings against budget should result from the reduction in the costs of salaries due to temporarily reduced staff numbers, a decision to hold a virtual Bureau Meeting in Spring 2105, savings negotiated at the General Assembly in Busan and reductions on travel and subsistence.

10. CHANGES IN FINANCIAL MANAGEMENT AND PROCESSES

10.1 NEW ACCOUNTING PRACTICES IN THE SECRETARIAT

The Executive Director reported that a review of the IUPAC financial system, functionality as well as the skills and processes that were in place was done in August 2014 and a determination that QuickBooks was a viable and widely used system that should suit IUPAC's needs (given the number of transactions and size of the business). The key issues were:

- The accounts and processes are not consistent with general accounting principles (GAP), cost accounting rules.
- The use of the multiple currency capability was not used and thus all currency exchanges are manually calculated and recalculated in order to account only in USD.
- Data entry was inconsistent for the recent years due to organizational changes.

Mr. Tom Vipperman, MBA, and Certified QuickBooks Professional and CFO was brought in to review the system and our use. A proposal for complete restructuring was developed and approved by the Officers and is essentially completed. The objective was to have an operational financial system that is GAP compliant and functions for all IUPAC's accounting needs. This will insure a solid financial footing upon which future reporting and business management can be accomplished with confidence and efficiency. The restructured QuickBooks 2015 is currently up and running as of January 30, 2015.
The next phase is to integrate other systems into QuickBooks (financial reports, payroll, expense claims) to enhance our capabilities and reduce data entry time whenever possible.

10.2 FUTURE AUDIT PROCESSES

The Executive Director reported that the Union will continue to engage third party auditors for our financial records as well as filing the required tax documents for maintaining our non-profit status in the US. Our new financial

accounting information system will be compliant with GAP standards and as such, is expected to require significant less CPA involvement from a third party CPA.

11. REVIEW OF DRAFT BUDGET FOR NEXT BIENNIUM (2016-2017)

The Treasurer reported that the Draft budget proposed to the Finance Committee has been drawn up with the benefits of considerably improved levels of information than has been the case in earlier biennia. On the income side the new arrangements for the investment of our portfolio has provided a definite goal for our income. The budget, as it has done in previous years, includes only income from dividends and interest: gains in the values of securities will not be realized. The experience of the first year working with the new publishing arrangements has also allowed us to make a better estimate of the income from that source although it may prove possible to make further savings on Chemistry International. On the expenditure side the new financial management and control systems recently introduced in the Secretariat means that the estimates of expenditure there can be realistic and that it will also be possible to have real time information of how that expenditure is progressing against the budget provisions so that adjustment and correction will be feasible for the first time.

The budget is based on a 3% year-on-year increase in the total request from National subscriptions. How that will break down for individual members depends also on other factors such as the changes in the chemical turnover in a country and in the exchange rate of its currency against the U.S. dollar. These two latter factors typically have a greater influence in how individual subscriptions change from one biennium to the next. We have also gained some new members since the last biennium which will lessen the burden on existing members but four countries have automatically ceased to be members through default in subscriptions over two years. In view of the generally difficult situation no new expenditures are proposed although it is recognized as the outcome of a detailed costing for 2015 that a more realistic funding must be provided for the Secretariat. Neither have any additional cuts beyond those introduced in the current biennium been introduced so that the programs operated by the Divisions and Standing Committees can continue at the same pace as heretofore. These provisions lead to a draft budget that it is deficit and although it has not been our custom to propose other than balanced budgets it should be possible to cover any deficit, should it arise, by drawing on the unrealized gains from the investment portfolio. The deficit could also be reduced by curtailing expenditures as we have done this year in respect of the meetings of advisory committees and by the increased general use of digital meeting technology to decrease travel costs.

The year just past, 2014, has been our first experience without the ‘cushion’ to our cash-flow of the subscription income to PAC: this is now collected by our publishing partners DeGruyter. Whereas it has been possible to manage it should be recognized that regulation of our cash flow has now largely passed outside of our control as its supply side depends essentially on the rate at which our members pay their subscriptions. It may therefore be worthwhile giving consideration to devising ways to encourage early payments or payments by installments although this would be unlikely to be popular with our NAOs.

The Finance Committee, while noting and acknowledging the difficult circumstances under which we operated, nonetheless advised that it would be preferable to continue our practice of presenting balanced budgets. This could best be achieved by cutting expenditures and the Committee further advised that activities should be prioritized to allow choices to be made.

12. FUNDRAISING STRATEGIES AND NEW SOURCES OF REVENUE

The Treasurer reminded the Committee that the annual income of the Union used to support its operations comes from three principal sources:

- National Subscription payments from National Adhering Organizations (NAOs);
- Income from publication of *Pure and Applied Chemistry* and *Chemistry International*;
- Income from the investment portfolio.

Following a realization that the income streams from both publications and investments were steadily declining corrective actions have been taken. In the case of our publications both PAC and CI, commencing January 2014, have been published in partnership with DeGruyter. The outcome for 2014 will see a halt in what had been a constant downward slide in the overall level of income from publications and it is anticipated that the marketing power of the publisher as well as cost savings will in future years reverse that trend. A wide-ranging review of *Chemistry International*, which has been a cost to the Union over the years, is attempting to identify and thus better satisfy customer needs and to redress that situation.

High-quality corporate bonds in IUPAC's investment portfolio that were purchased up to ten years ago and which were generating annual yields of about 5-8% have been maturing over the last four years. Upon redemption, it has not proved possible to find new bonds in which to reinvest the proceeds of the original bonds. Currently available yields are on the order of 2 to 4 times lower than previously and, as reported above; the portfolio has now been transferred to BB&T where it will be proactively managed.

If annual income fails to match expenditures, it becomes necessary to utilize capital from maturing bonds to sustain normal operations of the Union. Unfortunately, this has been the case during the past biennia. The consequent reduction in the investment portfolio leads to additional deterioration in the financial position of the Union.

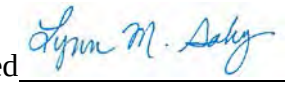
In order to compensate for the decline in income streams from publications and from investments during the past years, the Union must identify new opportunities and sources of income to replace the current losses. Any new sources of revenue must also be evaluated for their possible impacts on the tax status of the Union in both Switzerland and the US.

13. REVIEW OF TERMS OF REFERENCE OF FINANCE COMMITTEE

The current terms of reference of the Finance Committee were given on the first page of the Agenda Book. The Committee agreed that these should be updated to reflect the changes in the management of the finances of the Union detailed by the meeting.

15. DATE AND LOCATION OF NEXT MEETING

The next meeting will be held on Monday February 8th 2016 in Zurich.

Signed 

Date: 17 June 2015

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

Financial Statements

December 31, 2013 and 2012

(With Independent Auditors' Report Thereon)

BATCHELOR, TILLERY & ROBERTS, LLP
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Independent Auditors' Report

The Executive Committee
International Union of Pure and Applied Chemistry:

Report on the Financial Statements

We have audited the accompanying financial statements of International Union of Pure and Applied Chemistry ("IUPAC"), which comprise the statements of financial position as of December 31, 2013 and 2012, and the related statements of activities, cash flows, and functional expenses for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of IUPAC as of December 31, 2013 and 2012, and the changes in its net assets and its cash flows for the years then ended, in accordance with accounting principles generally accepted in the United States of America.

Batchelor, Tilley & Roberts, LLP

May 9, 2014

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Financial Position

December 31, 2013 and 2012

	2013	2012
Assets		
Current assets:		
Cash and cash equivalents	$ 402,248	682,592
Subscriptions receivable (net of allowance for doubtful accounts of $36,700 in 2013 and $56,000 in 2012)	72,000	102,600
Inventories	31,052	29,937
Prepaid expenses and other assets	1,853	41,325
Total current assets	507,153	856,454
Investments, at market value	3,897,078	4,000,346
Furniture, fixtures, and equipment, net	26,696	50,495
	$ 4,430,927	4,907,295
Liabilities and Net Assets		
Current liabilities:		
Accounts payable and accrued expenses	107,567	81,916
Unearned subscriptions	99,275	388,645
Total current liabilities	206,842	470,561
Commitments		
Net assets:		
Unrestricted	3,955,711	4,193,519
Temporarily restricted	76,017	50,858
Permanently restricted	192,357	192,357
Total net assets	4,224,085	4,436,734
	$ 4,430,927	4,907,295

See accompanying notes to financial statements.

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Activities

Year ended December 31, 2013, with comparative totals for 2012

	2013				
	Unrestricted	Temporarily restricted	Permanently restricted	Total	2012
Support:					
Grants and contributions	$ 48,990	16,000	-	64,990	115,238
National subscriptions and service charges	898,072	-	-	898,072	873,918
Affiliate membership program	42,937	-	-	42,937	42,081
Total support	989,999	16,000	-	1,005,999	1,031,237
Other revenue:					
Publications	563,844	-	-	563,844	613,882
Investment return, net	399,645	9,717	-	409,362	459,288
Other income	-	-	-	-	794
Total other revenue	963,489	9,717	-	973,206	1,073,964
Total support and other revenue	1,953,488	25,717	-	1,979,205	2,105,201
Net assets released from restrictions	558	(558)	-	-	-
	1,954,046	25,159	-	1,979,205	2,105,201
Expenses:					
Program and publications	1,322,532	-	-	1,322,532	996,799
Management and general	869,322	-	-	869,322	1,168,065
Total expenses	2,191,854	-	-	2,191,854	2,164,864
(Decrease) increase in net assets	(237,808)	25,159	-	(212,649)	(59,663)
Net assets, beginning of year	4,193,519	50,858	192,357	4,436,734	4,496,397
Net assets, end of year	$ 3,955,711	76,017	192,357	4,224,085	4,436,734

(Continued)

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Activities, Continued

Year ended December 31, 2012

	Unrestricted	Temporarily restricted	Permanently restricted	Total
Support:				
Grants and contributions	$ 115,238	-	-	115,238
National subscriptions and service charges	873,918	-	-	873,918
Affiliate membership program	42,081	-	-	42,081
Total support	1,031,237	-	-	1,031,237
Other revenue:				
Publications	613,882	-	-	613,882
Investment return, net	446,852	12,436	-	459,288
Other income	794	-	-	794
Total other revenue	1,061,528	12,436	-	1,073,964
Total support and other revenue	2,092,765	12,436	-	2,105,201
Net assets released from restrictions	13,377	(13,377)	-	-
	2,106,142	(941)	-	2,105,201
Expenses:				
Program and publications	996,799	-	-	996,799
Management and general	1,168,065	-	-	1,168,065
Total expenses	2,164,864	-	-	2,164,864
Decrease in net assets	(58,722)	(941)	-	(59,663)
Net assets, beginning of year	4,252,241	51,799	192,357	4,496,397
Net assets, end of year	$ 4,193,519	50,858	192,357	4,436,734

See accompanying notes to financial statements.

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Cash Flows

Years ended December 31, 2013 and 2012

		2013	2012
Cash flows from operating activities:			
Decrease in net assets	$	(212,649)	(59,663)
Adjustments to reconcile decrease in net assets to net cash used in operating activities:			
Depreciation and amortization		26,594	88,377
Realized (gains) losses on investments		(7,667)	170,728
Unrealized gains on investments		(257,296)	(460,077)
Changes in operating assets and liabilities:			
Subscriptions receivable		30,600	(78,195)
Inventories		(1,115)	(3,033)
Prepaid expenses and other assets		39,472	(14,643)
Accounts payable and accrued expenses		25,651	(27,191)
Unearned subscriptions		(289,370)	(64,158)
Net cash used in operating activities		(645,780)	(447,855)
Cash flows from investing activities:			
Proceeds from sales of investments		408,125	1,074,801
Purchases of investments		(39,894)	(615,726)
Purchases of furniture, fixtures, and equipment		(2,795)	-
Net cash provided by investing activities		365,436	459,075
Net (decrease) increase in cash and cash equivalents		(280,344)	11,220
Cash and cash equivalents, beginning of year		682,592	671,372
Cash and cash equivalents, end of year	$	402,248	682,592

See accompanying notes to financial statements.

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Functional Expenses

Year ended December 31, 2013, with comparative totals for 2012

	2013			
	Program and publications	Management and general	Total	2012
Travel and subsistence	$ 589,039	109,363	698,402	606,049
Salaries	-	396,186	396,186	503,261
Contracted services	377,926	9,141	387,067	428,352
Administrative and project costs	210,551	92,334	302,885	140,471
Payroll taxes and benefits	-	110,824	110,824	122,485
Postage	62,161	5,877	68,038	65,944
Prizes and awards	51,689	-	51,689	500
Office supplies and expenses	-	37,450	37,450	32,997
Audit and accounting	-	36,540	36,540	28,102
Contributions	28,472	-	28,472	26,344
Building operations	-	25,539	25,539	26,086
Depreciation and amortization	-	26,594	26,594	88,377
Utilities	-	17,162	17,162	17,154
Printing and publications	2,694	5,181	7,875	8,603
Advertising and recruiting	-	-	-	10,074
Grant refund	-	-	-	9,664
Bad debt (recoveries) expense	-	(9,500)	(9,500)	44,865
Miscellaneous	-	6,631	6,631	5,536
	$ 1,322,532	869,322	2,191,854	2,164,864

(Continued)

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Functional Expenses, Continued

Year ended December 31, 2012

	Program and publications	Management and general	Total
Travel and subsistence	$ 430,680	175,369	606,049
Salaries	-	503,261	503,261
Contracted services	398,654	29,698	428,352
Administrative and project costs	73,067	67,404	140,471
Payroll taxes and benefits	-	122,485	122,485
Depreciation and amortization	-	88,377	88,377
Postage	53,906	12,038	65,944
Bad debt expense	-	44,865	44,865
Office supplies and expenses	-	32,997	32,997
Audit and accounting	-	28,102	28,102
Contributions	26,344	-	26,344
Building operations	-	26,086	26,086
Utilities	-	17,154	17,154
Advertising and recruiting	-	10,074	10,074
Grant refund	9,664	-	9,664
Printing and publications	3,984	4,619	8,603
Prizes and awards	500	-	500
Miscellaneous	-	5,536	5,536
	$ 996,799	1,168,065	2,164,864

See accompanying notes to financial statements.

(1) Nature of Organization and Significant Accounting Policies

International Union of Pure and Applied Chemistry ("IUPAC"), founded in 1919, is a voluntary nongovernmental, nonprofit association of sixty-one national adhering organizations representing the chemists of their countries. Additionally, there are two associate national adhering organizations, sixty-three company associates, and thirty-four associated organizations.

The objectives of IUPAC are to promote continuing cooperation among the chemists of the member countries, to study topics of international importance to pure and applied chemistry which need standardization or codification, to cooperate with other international organizations which deal with topics of a chemical nature, and to contribute to the advancement of pure and applied chemistry in all its aspects.

The significant accounting policies of IUPAC are as follows:

(a) Support, Revenues, and Expenses

IUPAC derives its revenues primarily from national subscriptions, publication income, and investment income. Support, revenues, and expenses are recorded on the accrual basis of accounting, and revenue received for future subscriptions is deferred until the applicable year.

Contributions received are measured at their fair values and are reported as an increase in net assets. IUPAC reports contributions of cash and other assets as restricted support if they are received with donor stipulations that limit the use of the donated assets or if they are designated as support for future periods. When a donor restriction expires, that is, when a stipulated time restriction ends or purpose restriction is accomplished, temporarily restricted net assets are reclassified to unrestricted net assets and reported in the statement of activities as net assets released from restrictions. Donor restricted contributions whose restrictions are met in the same reporting period are reported as unrestricted support.

(b) Endowment Funds

The Executive Committee of IUPAC has interpreted relevant state law as requiring the preservation of the fair value of the original gift as of the gift date of the donor-restricted endowment funds absent explicit donor stipulations to the contrary. As a result of this interpretation, IUPAC classifies as permanently restricted net assets (a) the original value of gifts donated to the permanent endowment, (b) the original value of subsequent gifts to the permanent endowment, and (c) accumulations to the permanent endowment made in accordance with the direction of the applicable donor gift instrument at the time the accumulation is added to the fund. The remaining portion of the donor-restricted endowment fund that is not classified in permanently restricted net assets is classified as temporarily restricted net assets until those amounts are appropriated for expenditure by IUPAC in a manner consistent with the relevant endowment fund. IUPAC considers the following factors in making a determination to appropriate or accumulate donor-restricted endowment funds:

(1) Nature of Organization and Significant Accounting Policies, Continued

(b) Endowment Funds, Continued

(1) The duration and preservation of the fund
(2) The purposes of the organization and the donor-restricted endowment fund
(3) General economic conditions
(4) The possible effect of inflation and deflation
(5) The expected total return from income and the appreciation of investments
(6) Other resources of the organization
(7) The investment policies of the organization

Funds with Deficiencies

From time to time, the fair value of assets associated with individual donor-restricted endowment funds may fall below the level that the donor requires the organization to retain as a fund of perpetual duration. In accordance with accounting principles generally accepted in the United States of America ("GAAP"), deficiencies of this nature are reported in unrestricted net assets. There were no such deficiencies as of December 31, 2013 and 2012.

Return Objectives and Risk Parameters

IUPAC has adopted investment and spending policies for endowment assets that attempt to provide a predictable stream of funding to programs supported by its endowment while seeking to maintain the purchasing power of the endowment assets. Endowment assets include those assets of donor-restricted funds that IUPAC must hold in perpetuity or for a donor-specified period(s), as well as any board-designated funds. Under this policy, as approved by the Executive Committee, the endowment assets are invested in a manner that is intended to produce results that exceed the price and yield results of a benchmark portfolio and its respective market index, while assuming a moderate level of investment risk. IUPAC expects its endowment funds, over time, to provide an average rate of return of approximately 4.5% annually. Actual returns in any given year may vary from this amount.

Strategies Employed for Achieving Objectives

To satisfy its long-term rate-of-return objectives, IUPAC relies on a total return strategy in which investment returns are achieved through both capital appreciation (realized and unrealized) and current yield (interest and dividends). IUPAC targets a diversified asset allocation for its entire investment portfolio that places an emphasis on mutual funds, bonds and cash equivalents to achieve its long-term return objectives within prudent risk constraints.

(1) Nature of Organization and Significant Accounting Policies, Continued

(b) Endowment Funds, Continued

Spending Policy and How the Investment Objectives Relate to Spending Policy

IUPAC has a policy of appropriating for distribution each year the interest income allocated to each of its endowment funds, with such allocation approximating a 4% and 5% return for 2013 and 2012, respectively. In establishing this policy, management of IUPAC considered the long-term expected return on its endowment. This is consistent with IUPAC's objective to maintain the purchasing power of the endowment assets held in perpetuity or for a specified term as well as to provide additional real growth through new gifts and investment return.

(c) Cash and Cash Equivalents

Cash and cash equivalents include commercial checking and money market accounts. At year-end and throughout the year, IUPAC had on deposit with a financial institution amounts in excess of FDIC insurance limits of $250,000. IUPAC has not experienced any losses in such accounts and believes it is not exposed to any significant credit risk on cash and cash equivalents.

(d) Allowance for Doubtful Accounts

An allowance is provided for uncollectible receivables equal to the losses that are estimated to be incurred in the collection of all receivables. The allowance is based on historical collection experience combined with a review of the current status of the existing receivables.

(e) Inventories

Inventories, consisting of various publications, are stated at the lower of cost or market, with cost determined on the weighted-average method.

(f) Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. Relevant accounting standards establish a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. Three levels of inputs may be used to measure fair value:

Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities

Level 2: inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly

(1) Nature of Organization and Significant Accounting Policies, Continued

(f) Fair Value Measurements, Continued

Level 3: one or more significant inputs or significant value drivers are unobservable or based on market assumptions

(g) Investments

Investments in marketable securities are stated at fair market value. The fair value of mutual funds is based on quoted prices in active markets (Level 1). The fair values of bonds and fixed rate securities are based on information from pricing services and yields currently available on comparable securities (Level 2). Investment income (including gains and losses on investments, interest, and dividends) is included in the statements of activities as a change in unrestricted net assets, except for earnings on permanently restricted net assets which are reported as temporarily restricted.

(h) Furniture, Fixtures, and Equipment

Furniture, fixtures, and equipment are recorded at cost if purchased and fair value if contributed. Depreciation and amortization is provided over the estimated useful lives of the assets using the straight-line method.

(i) Income Taxes

IUPAC is exempt from federal and state income taxes under Section 501(c)(3) of the Internal Revenue Code and applicable state statutes. Management of IUPAC does not believe the financial statements include any uncertain tax positions. Tax years ending December 31, 2010 through December 31, 2013 remain open for the examination by taxing authorities as of the date of this report.

(j) Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of changes in net assets during the reporting period. Accordingly, actual results could differ from those estimates.

(2) Investments

IUPAC's investments are held by Wells Fargo Advisors. The following tables present the fair value of those investments (no individual investment represents ten percent or more of net assets):

	2013			
	Number of shares/par	Level 1	Level 2	Total
Mutual funds	-	$ 1,707,428	-	1,707,428
Corporate bonds (2.30% - 7.25%), with various maturities through February 2022	$ 1,250,000	-	1,346,830	1,346,830
Foreign bonds (3.25%-6.50%), with various maturities through July 2018	$ 600,000	-	842,820	842,820
		$ 1,707,428	2,189,650	3,897,078

	2012			
	Number of shares/par	Level 1	Level 2	Total
Mutual funds	-	$ 1,371,701	-	1,371,701
Preferred fixed rate cap security (5.88%), matures June 2033	6,000	-	151,020	151,020
Corporate bonds (2.30% - 7.25%), with various maturities through February 2022	$ 1,375,000	-	1,505,285	1,505,285
Foreign bonds (3.25%-6.50%), with various maturities through July 2018	$ 600,000	-	840,309	840,309
FHLMC bond (4.75%), due January 2013	$ 100,000	-	132,031	132,031
		$ 1,371,701	2,628,645	4,000,346

The cost of investments totaled $3,407,575 and $3,768,139 as of December 31, 2013 and 2012, respectively.

(2) Investments, Continued

Investment return, net, consists of the following:

	2013	2012
Dividends and interest	$ 147,560	165,053
Realized gains (losses)	7,667	(170,728)
Unrealized gains	257,296	460,077
Foreign exchange rate (losses) gains	(3,161)	4,886
	$ 409,362	459,288

(3) Furniture, Fixtures, and Equipment

Furniture, fixtures, and equipment consist of the following:

	2013	2012
Equipment	$ 66,423	63,628
Furniture and fixtures	48,877	48,877
Leasehold improvements	16,097	16,097
Website	264,145	264,145
	395,542	392,747
Less accumulated depreciation and amortization	(368,846)	(342,252)
	$ 26,696	50,495

(4) Leases

IUPAC leases its facilities under an operating lease, which began in March 1997. This lease has a term of ten years with options to extend the term of the lease for successive one-year periods not to exceed ten additional years. Building operating expenses totaled $25,539 and $26,086 in 2013 and 2012, respectively.

Future estimated minimum rental expenses consist of $25,735 for the year ending December 31, 2014.

(5) Net Assets

Temporarily restricted net assets as of December 31, 2013 and 2012 consist of interest earned on permanently restricted net assets and two new grants in 2013 that were not fully expanded.

Permanently restricted net assets include donor-restricted endowment funds and consist of the Paulo Fransozini Endowment Fund totaling $5,659, the CHEMRAWN VII Fund totaling $48,698, and the Samsung General Chemicals Endowment Fund totaling $138,000, as of December 31, 2013 and 2012. Income earned by the Paulo Fransozini Endowment Fund is restricted for awards to science students to attend particular IUPAC meetings. Income earned by the CHEMRAWN VII Fund is restricted for awards to support the work of the CHEMRAWN VII Future Actions Committee. Income earned by the Samsung General Chemicals Endowment Fund is restricted for awards to students and researchers in the field of polymer science and support of educational projects of the IUPAC Macromolecular Division. Such income is recorded as temporarily restricted when earned.

The following represents changes in endowment net assets (all donor-restricted endowment funds) for 2013 and 2012 (does not include temporarily restricted net assets of $16,000 related to two grants as of December 31, 2013):

	Temporarily restricted	Permanently restricted	Total
Endowment net assets, December 31, 2011	$ 51,714	192,357	244,071
Investment interest income	12,436	-	12,436
Appropriation of endowment assets for expenditure	(13,292)	-	(13,292)
Endowment net assets, December 31, 2012	50,858	192,357	243,215
Investment interest income	9,717	-	9,717
Appropriation of endowment assets for expenditure	(558)	-	(558)
Endowment net assets, December 31, 2013	$ 60,017	192,357	252,374

(6) Concentrations of Credit and Market Risk

Financial instruments that potentially expose IUPAC to concentrations of credit and market risk consist primarily of cash equivalents, investments, and subscriptions receivable. Cash equivalents and investments are held by Wells Fargo Advisors, and no single investment exceeds ten percent of net assets. Subscriptions receivable are amounts due from national adhering organizations. Management provides for probable uncollectible amounts through a provision for bad debt expense and an adjustment to a valuation allowance based on its assessment of the current status of individual accounts.

National adhering organizations are billed their annual national subscriptions in their national foreign currency. As a result, IUPAC assumes the risk of changes in the foreign currency rates in relation to the United States dollar on these billings. IUPAC has made purchases of certain foreign currency-denominated investments in an effort to reduce the risk of foreign currency exchange losses on these billings when collected.

(7) Retirement Plans

IUPAC has established a defined contribution retirement plan. The plan covers all employees and offers 100% vesting after one year of service. IUPAC made no contributions to the plan in 2013 or 2012.

(8) Subsequent Events

The date to which events occurring after December 31, 2013, the date of the most recent statement of financial position, have been evaluated for possible adjustment to the financial statements or disclosure is May 9, 2014, the date the financial statements were available to be issued.

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

Financial Statements

December 31, 2014 and 2013

(With Independent Auditors' Report Thereon)

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Independent Auditors' Report

The Executive Committee
International Union of Pure and Applied Chemistry:

Report on the Financial Statements

We have audited the accompanying financial statements of International Union of Pure and Applied Chemistry ("IUPAC"), which comprise the statements of financial position as of December 31, 2014 and 2013, and the related statements of activities, functional expenses, and cash flows for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditors' judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditors consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of IUPAC as of December 31, 2014 and 2013, and the changes in its net assets and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

Batchelor, Tillery & Roberts, LLP

July 8, 2015

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Financial Position

December 31, 2014 and 2013

	2014	2013
Assets		
Current assets:		
Cash and cash equivalents	$ 694,098	402,248
Subscriptions receivable (net of allowance for doubtful accounts of $74,674 in 2014 and $36,700 in 2013)	114,821	72,000
Accrued interest receivable	20,010	-
Inventories	34,045	31,052
Prepaid expenses	6,650	1,853
Total current assets	869,624	507,153
Investments, at market value	3,669,326	3,897,078
Furniture, fixtures, and equipment, net	9,744	26,696
Deposits	3,565	-
	$ 4,552,259	4,430,927
Liabilities and Net Assets		
Current liabilities:		
Accounts payable and accrued expenses	153,548	107,567
Unearned subscriptions	212,097	99,275
Total current liabilities	365,645	206,842
Commitments		
Net assets:		
Unrestricted	3,897,323	3,955,711
Temporarily restricted	96,934	76,017
Permanently restricted	192,357	192,357
Total net assets	4,186,614	4,224,085
	$ 4,552,259	4,430,927

See accompanying notes to financial statements.

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Activities

Year ended December 31, 2014, with comparative totals for 2013

	2014				
	Unrestricted	Temporarily restricted	Permanently restricted	Total	2013
Support:					
Grants and contributions	$ 12,496	58,751	-	71,247	64,990
National subscriptions and service charges	912,351	-	-	912,351	898,072
Affiliate membership program	40,291	-	-	40,291	42,937
Total support	965,138	58,751	-	1,023,889	1,005,999
Other revenue:					
Publications	99,217	-	-	99,217	563,844
Investment return, net	105,146	9,958	-	115,104	409,362
Total other revenue	204,363	9,958	-	214,321	973,206
Total support and other revenue	1,169,501	68,709	-	1,238,210	1,979,205
Net assets released from restrictions	47,792	(47,792)	-	-	-
	1,217,293	20,917	-	1,238,210	1,979,205
Expenses:					
Program and publications	517,273	-	-	517,273	1,322,532
Management and general	758,408	-	-	758,408	869,322
Total expenses	1,275,681	-	-	1,275,681	2,191,854
(Decrease) increase in net assets	(58,388)	20,917	-	(37,471)	(212,649)
Net assets, beginning of year	3,955,711	76,017	192,357	4,224,085	4,436,734
Net assets, end of year	$ 3,897,323	96,934	192,357	4,186,614	4,224,085

(Continued)

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Activities, Continued

Year ended December 31, 2013

	Unrestricted	Temporarily restricted	Permanently restricted	Total
Support:				
Grants and contributions	$ 48,990	16,000	-	64,990
National subscriptions and service charges	898,072	-	-	898,072
Affiliate membership program	42,937	-	-	42,937
Total support	989,999	16,000	-	1,005,999
Other revenue:				
Publications	563,844	-	-	563,844
Investment return, net	399,645	9,717	-	409,362
Total other revenue	963,489	9,717	-	973,206
Total support and other revenue	1,953,488	25,717	-	1,979,205
Net assets released from restrictions	558	(558)	-	-
	1,954,046	25,159	-	1,979,205
Expenses:				
Program and publications	1,322,532	-	-	1,322,532
Management and general	869,322	-	-	869,322
Total expenses	2,191,854	-	-	2,191,854
(Decrease) increase in net assets	(237,808)	25,159	-	(212,649)
Net assets, beginning of year	4,193,519	50,858	192,357	4,436,734
Net assets, end of year	$ 3,955,711	76,017	192,357	4,224,085

See accompanying notes to financial statements.

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Functional Expenses

Year ended December 31, 2014, with comparative totals for 2013

	2014			
	Program and publications	Management and general	Total	2013
Travel and subsistence	$ 356,649	99,554	456,203	698,402
Salaries	-	295,808	295,808	396,186
Contracted services	92,334	48,210	140,544	387,067
Payroll taxes and benefits	-	77,839	77,839	110,824
Office supplies and expenses	-	59,502	59,502	37,450
Administrative and project costs	36,716	10,764	47,480	302,885
Bad debt expense (recoveries)	-	44,805	44,805	(9,500)
Audit and accounting	-	35,635	35,635	36,540
Building operations	-	27,091	27,091	25,539
Contributions	26,189	-	26,189	28,472
Utilities	-	21,879	21,879	17,162
Depreciation and amortization	-	21,746	21,746	26,594
Postage	2,471	5,766	8,237	68,038
Printing and publications	1,914	1,983	3,897	7,875
Prizes and awards	1,000	-	1,000	51,689
Miscellaneous	-	7,826	7,826	6,631
	$ 517,273	758,408	1,275,681	2,191,854

(Continued)

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Functional Expenses, Continued

Year ended December 31, 2013

	Program and publications	Management and general	Total
Travel and subsistence	$ 589,039	109,363	698,402
Salaries	-	396,186	396,186
Contracted services	377,926	9,141	387,067
Administrative and project costs	210,551	92,334	302,885
Payroll taxes and benefits	-	110,824	110,824
Postage	62,161	5,877	68,038
Prizes and awards	51,689	-	51,689
Office supplies and expenses	-	37,450	37,450
Audit and accounting	-	36,540	36,540
Contributions	28,472	-	28,472
Building operations	-	25,539	25,539
Depreciation and amortization	-	26,594	26,594
Utilities	-	17,162	17,162
Printing and publications	2,694	5,181	7,875
Bad debt recoveries	-	(9,500)	(9,500)
Miscellaneous	-	6,631	6,631
	$ 1,322,532	869,322	2,191,854

See accompanying notes to financial statements.

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

Statements of Cash Flows

Years ended December 31, 2014 and 2013

		2014	2013
Cash flows from operating activities:			
Decrease in net assets	$	(37,471)	(212,649)
Adjustments to reconcile decrease in net assets to net cash provided by (used in) operating activities:			
Depreciation and amortization		21,746	26,594
Realized gains on investments		(476,692)	(7,667)
Unrealized losses (gains) on investments		491,904	(257,296)
Changes in operating assets and liabilities:			
Subscriptions receivable		(42,821)	30,600
Accrued interest receivable		(20,010)	-
Inventories		(2,993)	(1,115)
Prepaid expenses		(4,797)	39,472
Accounts payable and accrued expenses		45,981	25,651
Unearned subscriptions		112,822	(289,370)
Net cash provided by (used in) operating activities		87,669	(645,780)
Cash flows from investing activities:			
Proceeds from sales of investments		3,239,267	408,125
Purchases of investments		(3,026,727)	(39,894)
Deposits		(3,565)	-
Purchases of furniture, fixtures, and equipment		(4,794)	(2,795)
Net cash provided by investing activities		204,181	365,436
Net increase (decrease) in cash and cash equivalents		291,850	(280,344)
Cash and cash equivalents, beginning of year		402,248	682,592
Cash and cash equivalents, end of year	$	694,098	402,248

See accompanying notes to financial statements.

(1) Nature of Organization and Significant Accounting Policies

International Union of Pure and Applied Chemistry ("IUPAC"), founded in 1919, is a voluntary nongovernmental, nonprofit association of sixty-five national adhering organizations representing the chemists of their countries. Additionally, there are three associate national adhering organizations, sixty-nine company associates, and thirty-four associated organizations.

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(b) Endowment Funds

The Executive Committee of IUPAC has interpreted relevant state law as requiring the preservation of the fair value of the original gift as of the gift date of the donor-restricted endowment funds absent explicit donor stipulations to the contrary. As a result of this interpretation, IUPAC classifies as permanently restricted net assets (a) the original value of gifts donated to the permanent endowment, (b) the original value of subsequent gifts to the permanent endowment, and (c) accumulations to the permanent endowment made in accordance with the direction of the applicable donor gift instrument at the time the accumulation is added to the fund. The remaining portion of the donor-restricted endowment fund that is not classified in permanently restricted net assets is classified as temporarily restricted net assets until those amounts are appropriated for expenditure by IUPAC in a manner consistent with the relevant endowment fund. IUPAC considers the following factors in making a determination to appropriate or accumulate donor-restricted endowment funds:

(1) Nature of Organization and Significant Accounting Policies, Continued

(b) Endowment Funds, Continued

(1) The duration and preservation of the fund
(2) The purposes of the organization and the donor-restricted endowment fund
(3) General economic conditions
(4) The possible effect of inflation and deflation
(5) The expected total return from income and the appreciation of investments
(6) Other resources of the organization
(7) The investment policies of the organization

Funds with Deficiencies

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IUPAC has adopted investment and spending policies for endowment assets that attempt to provide a predictable stream of funding to programs supported by its endowment while seeking to maintain the purchasing power of the endowment assets. Endowment assets include those assets of donor-restricted funds that IUPAC must hold in perpetuity or for a donor-specified period(s), as well as any board-designated funds. Under this policy, as approved by the Executive Committee, the endowment assets are invested in a manner that is intended to produce results that exceed the price and yield results of a benchmark portfolio and its respective market index, while assuming a moderate level of investment risk. IUPAC expects its endowment funds, over time, to provide an average rate of return of approximately 4.5% annually. Actual returns in any given year may vary from this amount.

Strategies Employed for Achieving Objectives

To satisfy its long-term rate-of-return objectives, IUPAC relies on a total return strategy in which investment returns are achieved through both capital appreciation (realized and unrealized) and current yield (interest and dividends). IUPAC targets a diversified asset allocation for its entire investment portfolio that places an emphasis on mutual funds, bonds and cash equivalents to achieve its long-term return objectives within prudent risk constraints.

(1) Nature of Organization and Significant Accounting Policies, Continued

(b) Endowment Funds, Continued

Spending Policy and How the Investment Objectives Relate to Spending Policy

IUPAC has a policy of appropriating for distribution each year the interest income allocated to each of its endowment funds, with such allocation approximating a 4% return for both 2014 and 2013. In establishing this policy, management of IUPAC considered the long-term expected return on its endowment. This is consistent with IUPAC's objective to maintain the purchasing power of the endowment assets held in perpetuity or for a specified term as well as to provide additional real growth through new gifts and investment return.

(c) Cash and Cash Equivalents

Cash and cash equivalents include commercial checking and money market accounts. At year-end and throughout the year, IUPAC had on deposit with a financial institution amounts in excess of FDIC insurance limits of $250,000. IUPAC has not experienced any losses in such accounts and believes it is not exposed to any significant credit risk on cash and cash equivalents.

(d) Allowance for Doubtful Accounts

An allowance is provided for uncollectible receivables equal to the losses that are estimated to be incurred in the collection of all receivables. The allowance is based on historical collection experience combined with a review of the current status of the existing receivables.

(e) Inventories

Inventories, consisting of various publications, are stated at the lower of cost or market, with cost determined on the weighted-average method.

(f) Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. Relevant accounting standards establish a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. Three levels of inputs may be used to measure fair value:

Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities

Level 2: inputs other than quoted prices included within Level 1 that are observable for the asset or liability, either directly or indirectly

Level 3: one or more significant inputs or significant value drivers are unobservable or based on market assumptions

(1) Nature of Organization and Significant Accounting Policies, Continued

(g) Investments

Investments in marketable securities are stated at fair market value. The fair value of mutual funds is based on quoted prices in active markets (Level 1). The fair values of bonds and fixed rate securities are based on information from pricing services and yields currently available on comparable securities (Level 2). Investment income (including gains and losses on investments, interest, and dividends) is included in the statements of activities as a change in unrestricted net assets, except for earnings on permanently restricted net assets which are reported as temporarily restricted.

(h) Furniture, Fixtures, and Equipment

Furniture, fixtures, and equipment are recorded at cost if purchased and fair value if contributed. Depreciation and amortization is provided over the estimated useful lives of the assets using the straight-line method.

(i) Income Taxes

IUPAC is exempt from federal and state income taxes under Section 501(c)(3) of the Internal Revenue Code and applicable state statutes. Management of IUPAC does not believe the financial statements include any uncertain tax positions. Tax years ending December 31, 2011 through December 31, 2014 remain open for the examination by taxing authorities as of the date of this report.

(j) Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of changes in net assets during the reporting period. Accordingly, actual results could differ from those estimates.

2) Investments

IUPAC's investments were held by Wells Fargo Advisors in 2013 and part of 2014. All investments were transferred to and are held by BB&T Securities as of December 31, 2014. The following tables present the fair value of those investments (individual investment representing ten percent or more of net assets is separately identified):

	2014			
	Number of shares/par	Level 1	Level 2	Total
Mutual funds:				
Federated Floating Rate Strategy Income	45,389	$ 447,535	-	447,535
Other	-	2,201,423	-	2,201,423
		2,648,958	-	2,648,958
Corporate bonds (2.30% - 7.25%), with various maturities through February 2022	$ 984,000	-	1,020,368	1,020,368
		$ 2,648,958	1,020,368	3,669,326

	2013			
	Number of shares/par	Level 1	Level 2	Total
Mutual funds	-	$ 1,707,428	-	1,707,428
Corporate bonds (2.30% - 7.25%), with various maturities through February 2022	$ 1,250,000	-	1,346,830	1,346,830
Foreign bonds (3.25%-6.50%), with various maturities through July 2018	$ 600,000	-	842,820	842,820
		$ 1,707,428	2,189,650	3,897,078

The cost of investments totaled $3,671,726 and $3,407,575 as of December 31, 2014 and 2013, respectively.

Investment return, net, consists of the following:

	2014	2013
Dividends and interest	$ 151,728	147,560
Realized gains	476,692	7,667
Unrealized (losses) gains	(491,904)	257,296
Foreign exchange rate losses	(21,412)	(3,161)
	$ 115,104	409,362

(3) Furniture, Fixtures, and Equipment

Furniture, fixtures, and equipment consist of the following:

	2014	2013
Equipment	$ 71,217	66,423
Furniture and fixtures	48,877	48,877
Leasehold improvements	16,097	16,097
Website	264,145	264,145
	400,336	395,542
Less accumulated depreciation and amortization	(390,592)	(368,846)
	$ 9,744	26,696

(4) Leases

IUPAC leased its facilities under an operating lease, which began in March 1997. The lease had a term of ten years with options to extend the term of the lease for successive one-year periods not to exceed ten additional years. Building operating expenses totaled $27,091 and $25,539 in 2014 and 2013, respectively.

IUPAC entered into a lease for new office space beginning in May 2015 for an initial term of seventy-four months with a five-year renewal option.

IUPAC leases office equipment under operating lease agreements that expire at various dates through 2020. Equipment lease expense totaled approximately $760 and $501 for 2014 and 2013, respectively.

Future minimum rental payments required under these operating leases are as follows:

Year ending December 31,	
2015	$ 34,744
2016	49,024
2017	50,333
2018	51,062
2019	52,194
Thereafter	74,933
	$ 312,290

(5) Net Assets

Temporarily restricted net assets as of December 31, 2014 and 2013 consist of interest earned on permanently restricted net assets and four grants in 2014 and two grants in 2013 that were not fully expended.

Permanently restricted net assets include donor-restricted endowment funds and consist of the Paulo Fransozini Endowment Fund totaling $5,659, the CHEMRAWN VII Fund totaling $48,698, and the Samsung General Chemicals Endowment Fund totaling $138,000, as of December 31, 2014 and 2013. Income earned by the Paulo Fransozini Endowment Fund is restricted for awards to science students to attend particular IUPAC meetings. Income earned by the CHEMRAWN VII Fund is restricted for awards to support the work of the CHEMRAWN VII Future Actions Committee. Income earned by the Samsung General Chemicals Endowment Fund is restricted for awards to students and researchers in the field of polymer science and support of educational projects of the IUPAC Macromolecular Division. Such income is recorded as temporarily restricted when earned.

The following represents changes in endowment net assets (all donor-restricted endowment funds) for 2014 and 2013 (does not include temporarily restricted net assets of $40,058 related to four grants as of December 31, 2014 and $16,000 related to two grants as of December 31, 2013):

	Temporarily restricted	Permanently restricted	Total
Endowment net assets, December 31, 2012	$ 50,858	192,357	243,215
Investment interest income	9,717	-	9,717
Appropriation of endowment assets for expenditure	(558)	-	(558)
Endowment net assets, December 31, 2013	60,017	192,357	252,374
Investment interest income	9,958	-	9,958
Appropriation of endowment assets for expenditure	(13,099)	-	(13,099)
Endowment net assets, December 31, 2014	$ 56,876	192,357	249,233

(6) Concentrations of Credit and Market Risk

Financial instruments that potentially expose IUPAC to concentrations of credit and market risk consist primarily of cash equivalents, investments, and subscriptions receivable. Cash equivalents and investments are held by BB&T Securities, and one investment exceeds ten percent of net assets (see footnote 2). Subscriptions receivable are amounts due from national adhering organizations. Management provides for probable uncollectible amounts through a provision for bad debt expense and an adjustment to a valuation allowance based on its assessment of the current status of individual accounts.

National adhering organizations are billed their annual national subscriptions in their national foreign currency. As a result, IUPAC assumes the risk of changes in the foreign currency rates in relation to the United States dollar on these billings. IUPAC has made purchases of certain foreign currency-denominated investments in an effort to reduce the risk of foreign currency exchange losses on these billings when collected.

(7) Retirement Plans

IUPAC has established a defined contribution retirement plan. The plan covers all employees and offers 100% vesting after one year of service. IUPAC made no contributions to the plan in 2014 or 2013.

(8) Subsequent Events

The date to which events occurring after December 31, 2014, the date of the most recent statement of financial position, have been evaluated for possible adjustment to the financial statements or disclosure is July 8, 2015, the date the financial statements were available to be issued.

19.4 National Adhering Organizations and Associate National Adhering Organizations in Arrears

As of 16 July 2015, six National Adhering Organizations are in arrears for their 2014 National Subscription payments (Argentina, Belguim, Cuba, Ethiopia, Jordan and Tunisia). The Secretariat is working with these NAO's to resolve the problem as soon as possible.

As of 16 July 2015, two Associated National Adhering Organizations are in arrears for greater than 24 months. The 2013 and 2014 ANAO payments have not been received from Indonesia and Venezuela.

20.1 Proposed Budget for 2016-2017

Amounts in thousands of USD	Budget 2014-2015	Budget 2016	Budget 2017	Budget 2016-2017	Biennial Change 2016-2017 vs. 2014-2015
INCOME					
National Subscriptions [1]	1853.6	956.3	975.5	1931.8	78.2
Service Charges; CA Fees	10.0	6.7	6.7	13.4	3.4
Interest and Dividends [2]	330.6	140.0	140.0	280.0	-50.6
Transfer of Surplus Project Funds [3]	80.0	40.0	40.0	80.0	0.0
Sub-Total	2274.2	**1143.0**	**1162.2**	**2305.2**	31.0
Publications:					
Income from De Gruyter [4]	260.0	163.2	241.0	404.2	144.2
Income from De Gruyter Database [5 New]		19.3	29.0	48.3	48.3
Royalties and Copyright		2.5	2.5	5.0	5.0
Sub-Total	260.0	185.0	272.5	**457.5**	197.5
AMP: Contributions [6]	0.0	15.0	15.0	30.0	30.0
TOTAL INCOME	**2534.2**	1343.0	1449.7	**2792.7**	**258.5**

20.1 Proposed Budget for 2016-2017

Amounts in thousands of USD	Budget 2014-2015	Budget 2016	Budget 2017	Budget 2016-2017	Biennial Change 2016/2017 vs. 2014/2015
EXPENSES					
Governance Expense					
Officers	74.4	34.7	34.7	69.4	-5.0
Contributions to ICSU	54.4	23.0	23.0	46.0	-8.4
Sub Total	128.8	57.7	57.7	115.4	**-13.4**
General Administrative					
Secretariat					
Salaries and Benefits		502.0	522.0	1024.0	
Fixed Costs		129.7	128.4	258.1	
Variable Costs		59.0	59.0	118.0	
Secretariat [7] Total	1130.0	**690.7**	**709.4**	**1400.1**	**270.1**
Accounting, Audit, and Bank Fees [8]	80.0	25.0	25.0	50.0	-30.0
	1210.0	715.7	734.4	**1450.1**	**240.1**
AMP - Direct Costs [9]	0.0	0.0	0.0	0.0	0.0
Total Administrative	1210.0	715.7	734.4	1450.1	**240.1**
Accounting Transactions					
Depreciation	20.0	10.0	10.0	20.0	0.0
Foreign Exchange Differences [10]	20.0	25.0	30.0	55.0	35.0
Allowance for doubtful accounts	0.0	0.0	0.0	0.0	0.0
	40.0	35.0	40.0	**75.0**	35.0

20.1 Proposed Budget for 2016-2017

Amounts in thousands of USD	Budget 2014-2015	Budget 2016	Budget 2017	Budget 2016-2017	Biennial Change 2016-2017 vs. 2014-2015
Operations Expense					
Standing Committees *	251.7	176.2	40.5	216.7	-35.0
Divisions	443.8	310.7	133.1	443.8	0.0
Strategic Opportunities Fund	0.0	0.0	0.0	0.0	0.0
General Assembly[11]	325.0	5.0	400.0	405.0	80.0
IUPAC-Solvay Young Chemist Prize [12]	10.0	5.0	5.0	10.0	0.0
Financial Support Conferences (FSC) [13]	35.0	15.0	15.0	30.0	-5.0
Representatives to Other Organizations	20.0	10.0	10.0	20.0	0.0
Contingencies	0.0	0.0	0.0	0.0	0.0
Chemistry Olympiad/Other Essential		2.5	2.5	5.0	
Project Committee	70.0	35.0	35.0	70.0	0.0
Restricted Expenses	0.0	0.0	0.0	0.0	0.0
	1155.5	559.4	641.1	1200.5	45.0
TOTAL EXPENSES	2534.3	1367.8	1473.2	2841.0	**306.7**
NET INCOME (EXPENSE) (FROM OPERATIONS)	**-0.1**	**-24.8**	**-23.5**	**-48.3**	**-48.2**

Footnotes to Budget Line Entries

[1] NS total income for 2016 is 2% higher than in 2015 (USD 940.5); NS total income for 2017 is 2% higher than in 2016.

[2] Based on best estimates of 2015 Portfolio Interest & Dividends Net of Fees, No Capital Appreciation included.

[3] Surplus funds from completed, terminated, underspent, and abandoned projects (estimated from actual results for 2014).

[4] Income generated by publishing partnership with De Gruyter publishing house, Berlin, Germany, for both *PAC* and *CI*.

[5] De Gruyter & IUPAC Database "Standards Online" Royalty at 12.5% Revenue-Launch 2016

[6] De Gruyter will manage production and distribution of *CI* for IUPAC AMP members.

[7] Secretariat Budget developed from 2015 Detailed Budget Five Staff/Hold on Hire

[8] Reduction of CPA costs due to Payroll Outsourcing, Financial Information System restructuring and internal Controller

[9] De Gruyter assumes 50% of costs of production and 0% distribution of CI; 100% distribution of *PAC* and *CI* in 2016.

[10] Foreign Exchange Losses expected higher for Biennium

** 2017 Reduced 35K for Bureau Meeting Costs*

[11] General Assembly costs underestimated-Correction for anticipated actual costs (San Paulo, Brazil 2017)

[12] IUPAC will only award 10,000 towards the IUPAC-Solvay Prize. Remainder provided by Solvay at 10,000 Euros

[13] Financial Support to Conferences (FSC) reduced to USD 30K for 2016-2017.

20.1 Proposed Budget for 2016-2017

Amounts in thousands of USD	Budget 2014-2015	Budget 2016	Budget 2017	Budget 2016-2017	Biennial Change 2016-2017 vs. 2014-2015
INCOME					
National Subscriptions [1]	1,853.6	886.9	931.2	1818.1	(35.5)
Service Charges; CA Fees	10.0	6.7	6.7	13.4	3.4
Interest and Dividends [2]	330.6	140.0	140.0	280.0	(50.6)
Transfer of Surplus Project Funds [3]	80.0	40.00	40.00	80.0	-
Sub-Total	2,274.2	**1073.6**	**1117.9**	**2191.5**	(82.7)
Publications:					
Income from De Gruyter [4]	260.0	163.2	241.0	404.2	144.2
Income from De Gruyter Database [5 New]		19.3	29.0	48.3	48.3
Royalties and Copyright		2.5	2.5	5.0	5.0
Sub-Total	260.0	185.0	272.5	**457.5**	197.5
AMP: Contributions [6]	0.0	15.0	15.0	30.00	30.0
TOTAL INCOME	**2,534.2**	1,273.6	1,405.4	**2,679.0**	**144.8**

20.1 Proposed Budget for 2016-2017

Amounts in thousands of USD	Budget 2014-2015	Budget 2016	Budget 2017	Budget 2016-2017	Biennial Change 2016/2017 vs. 2014/2015
EXPENSES					
Governance Expense					
Officers	74.4	34.7	34.7	69.4	(5.0)
Contributions to ICSU	54.4	23.0	23.0	46.0	(8.4)
Sub Total	128.8	57.7	57.7	115.4	**(13.4)**
General Administrative					
Secretariat					
Salaries and Benefits		502.0	522.0	1024.0	
Fixed Costs		129.7	128.4	258.1	
Variable Costs		59.0	59.0	118.0	
Secretariat [7] Total	1130.0	**690.7**	**709.4**	**1400.1**	**270.1**
Accounting, Audit, and Bank Fees [8]	80.0	25.0	25.0	50.0	(30.0)
	1210.0	715.7	734.4	**1450.1**	**240.1**
AMP - Direct Costs [9]	0.0	0.0	0.0	0.0	-
Total Administrative	1,210.0	715.7	734.4	1,450.1	**240.1**
Accounting Transactions					
Depreciation	20.0	10.0	10.0	20.0	-
Foreign Exchange Differences [10]	20.0	25.0	30.0	55.0	35.0
Allowance for doubtful accounts	0.0	0.0	0.0	0.0	-
	40.0	35.0	40.0	**75.0**	35.0

Amounts in thousands of USD	Budget 2014-2015	Budget 2016	Budget 2017	Budget 2016-2017	Biennial Change 2016-2017 vs. 2014-2015
Operations Expense					
Standing Committees *	251.7	176.2	40.5	216.7	(35.00)
Divisions	443.8	310.7	133.1	443.8	-
Strategic Opportunities Fund	0.0	0.0	0.0	0.0	-
General Assembly[11]	325.0	5.0	400.0	405.0	80.0
IUPAC-Solvay Young Chemist Prize [12]	10.0	5.0	5.0	10.0	-
Financial Support Conferences (FSC) [13]	35.0	15.0	15.0	30.0	(5.0)
Representatives to Other Organizations	20.0	10.0	10.0	20.0	-
Contingencies	0.0	0.0	0.0	0.0	-
Chemistry Olympiad/Other Essential		2.5	2.5	5.0	
Project Committee	70.0	35.0	35.0	70.0	-
Restricted Expenses	0.0	0.0	0.0	0.0	-
	1,155.5	559.4	641.1	1,200.5	45.0
TOTAL EXPENSES	2,534.3	1,367.8	1,473.2	2,841.0	**306.7**
NET INCOME (EXPENSE) (FROM OPERATIONS)	**(0.1)**	**-94.2**	**-67.8**	**-162.0**	**(161.9)**

Footnotes to Budget Line Entries

[1] NS total income calculated from 2015 with 1st Quarter Average ER in NC plus 5% YOY NC Increase

[2] Based on best estimates of 2015 Portfolio Interest & Dividends Net of Fees, No Capital Appreciation included.

[3] Surplus funds from completed, terminated, underspent, and abandoned projects (estimated from actual results for 2014).

[4] Income generated by publishing partnership with De Gruyter publishing house, Berlin, Germany, for both *PAC* and *CI*.

[5] De Gruyter & IUPAC Database "Standards Online" Royalty at 12.5% Revenue-Launch 2016

[6] De Gruyter will manage production and distribution of *CI* for IUPAC AMP members.

[7] Secretariat Budget developed from 2015 Detailed Budget Five Staff/Hold on Hire

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[9] De Gruyter assumes 50% of costs of production and 0% distribution of CI; 100% distribution of *PAC* and *CI* in 2016.

[10] Foreign Exchange Losses expected higher for Biennium

** 2017 Reduced 35K for Bureau Meeting Costs*

[11] *General Assembly costs underestimated-Correction for anticipated actual costs (San Paulo, Brazil 2017)*

[12] *IUPAC will only award 10,000 towards the IUPAC-Solvay Prize. Remainder provided by Solvay at 10,000 Euros*

[13] *Financial Support to Conferences (FSC) reduced to USD 30K for 2016-2017.*

20.2 Current Model

NAO	Currency	2015 (NC 10^3)	2016 (NC 10^3)	2017 (NC 10^3)	Percent Change 2016 over 2015	2017 over 2016
Argentina	ARS	41.319	79.962	81.586	93.5%	2.0%
Australia	AUD	12.833	11.155	11.382	-13.1%	2.0%
Austria	EUR	5.799	7.652	7.808	32.0%	2.0%
Belgium	EUR	15.935	15.222	15.532	-4.5%	2.0%
Brazil	USD	35.626	33.084	33.756	-7.1%	2.0%
Bulgaria	BGN	3.148	2.887	2.946	-8.3%	2.0%
Canada	CAD	18.502	18.297	18.668	-1.1%	2.0%
Chile	CLP	5262.052	8,798.903	8,977.676	67.2%	2.0%
China/Beijing	CNY	849.018	1,025.944	1,046.789	20.8%	2.0%
China/Taipei	TWD	862.873	893.768	911.927	3.6%	2.0%
Croatia	USD	1.000	1.000	1.000	0.0%	0.0%
Cuba	USD	1.000	1.000	1.000	0.0%	0.0%
Czech Republic	CZK	129.069	135.273	138.022	4.8%	2.0%
Denmark	DKK	28.824	27.035	27.584	-6.2%	2.0%
Egypt	EGP	24.424	28.978	29.567	18.6%	2.0%
Ethiopia	USD	1.000	1.000	1.000	0.0%	0.0%
Finland	EUR	5.295	5.135	5.239	-3.0%	2.0%
France	EUR	29.644	26.646	27.187	-10.1%	2.0%
Germany	EUR	44.356	41.866	42.717	-5.6%	2.0%
Greece	EUR	2.820	2.439	2.489	-13.5%	2.0%
Hungary	HUF	1141.756	1,198.627	1,222.980	5.0%	2.0%
India	USD	26.904	31.220	31.855	16.0%	2.0%
Ireland	EUR	4.477	3.315	3.382	-26.0%	2.0%
Israel	ILS	37.912	40.333	41.152	6.4%	2.0%
Italy	EUR	22.325	20.135	20.544	-9.8%	2.0%
Jamaica	JMD	88.413	109.577	109.577	23.9%	0.0%
Japan	JPY	4708.441	6,209.836	6,336.005	31.9%	2.0%
Jordan	JOD	0.709	1.239	1.264	74.8%	2.0%
Kazakhstan (P)	USD	1.000	1.000	1.000	0.0%	0.0%
Korea, Republic	USD	41.584	44.789	45.699	7.7%	2.0%
Kuwait	KWD	0.280	0.284	0.284	1.5%	0.0%
Luxembourg	EUR	0.778	0.753	0.753	-3.2%	0.0%
Malaysia	MYR	37.325	45.246	46.165	21.2%	2.0%
Mozambique	USD	1.000	1.000	1.000	0.0%	0.0%
Nepal	USD	1.000	1.000	1.000	0.0%	0.0%
Netherlands	EUR	21.390	19.224	19.615	-10.1%	2.0%
New Zealand	NZD	4.329	4.205	4.290	-2.9%	2.0%
Nigeria	USD	1.000	1.000	1.000	0.0%	0.0%
Norway	NOK	41.825	42.690	43.558	2.1%	2.0%
Pakistan	USD	4.172	3.288	3.355	-21.2%	2.0%
Poland	PLN	34.863	33.867	34.555	-2.9%	2.0%
Portugal	EUR	4.004	3.765	3.841	-6.0%	2.0%
Puerto Rico	USD	19.987	22.281	22.734	11.5%	2.0%
Senegal (P)	USD	1.000	1.000	1.000	0.0%	0.0%
Russia	USD	25.732	26.423	26.960	2.7%	2.0%
Serbia	USD	1.000	1.000	1.000	0.0%	0.0%
Slovakia	EUR	2.411	2.406	2.455	-0.2%	2.0%
Slovenia	EUR	1.943	1.793	1.829	-7.7%	2.0%
South Africa	ZAR	80.698	105.733	107.881	31.0%	2.0%
Spain	EUR	17.600	13.229	13.498	-24.8%	2.0%
Sri Lanka	LKR	127.595	130.351	130.351	2.2%	0.0%
Sweden	SEK	57.130	54.701	55.813	-4.3%	2.0%
Switzerland	CHF	11.548	9.744	9.942	-15.6%	2.0%
Thailand	THB	334.711	371.719	379.272	11.1%	2.0%
Tunisia	TND	4.144	1.693	1.693	-59.1%	0.0%
Turkey	TRY	19.941	26.487	27.025	32.8%	2.0%
UK	GBP	18.118	13.908	14.190	-23.2%	2.0%
Uruguay	UYU	20.226	22.786	22.786	12.7%	0.0%
USA	USD	111.264	111.649	113.918	0.3%	2.0%

20.2 National Subscriptions for 2016-2017

IUPAC NATIONAL SUBSCRIPTIONS FOR 2016-2017				
NAO	Currency	2015 (NC 10^3)	2016 (NC 10^3)	2017 (NC 10^3)
Argentina	ARS	41.319	79.962	81.586
Australia	AUD	12.833	11.155	11.382
Austria	EUR	5.799	7.652	7.808
Belgium	EUR	15.935	15.222	15.532
Brazil	USD	35.626	33.084	33.756
Bulgaria	BGN	3.148	2.887	2.946
Canada	CAD	18.502	18.297	18.668
Chile	CLP	5262.052	8,798.903	8,977.676
China/Beijing	CNY	849.018	1,025.944	1,046.789
China/Taipei	TWD	862.873	893.768	911.927
Croatia	USD	1.000	1.000	1.000
Cuba	USD	1.000	1.000	1.000
Czech Republic	CZK	129.069	135.273	138.022
Denmark	DKK	28.824	27.035	27.584
Egypt	EGP	24.424	28.978	29.567
Ethiopia	USD	1.000	1.000	1.000
Finland	EUR	5.295	5.135	5.239
France	EUR	29.644	26.646	27.187
Germany	EUR	44.356	41.866	42.717
Greece	EUR	2.820	2.439	2.489
Hungary	HUF	1141.756	1,198.627	1,222.980
India	USD	26.904	31.220	31.855
Ireland	EUR	4.477	3.315	3.382
Israel	ILS	37.912	40.333	41.152
Italy	EUR	22.325	20.135	20.544
Jamaica	JMD	88.413	109.577	109.577
Japan	JPY	4708.441	6,209.836	6,336.005
Jordan	JOD	0.709	1.239	1.264
Kazakhstan (P)	USD	1.000	1.000	1.000
Korea, Republic	USD	41.584	44.789	45.699
Kuwait	KWD	0.280	0.284	0.284
Luxembourg	EUR	0.778	0.753	0.753
Malaysia	MYR	37.325	45.246	46.165
Mozambique	USD	1.000	1.000	1.000
Nepal	USD	1.000	1.000	1.000
Netherlands	EUR	21.390	19.224	19.615
New Zealand	NZD	4.329	4.205	4.290
Nigeria	USD	1.000	1.000	1.000
Norway	NOK	41.825	42.690	43.558
Pakistan	USD	4.172	3.288	3.355
Poland	PLN	34.863	33.867	34.555
Portugal	EUR	4.004	3.765	3.841
Puerto Rico	USD	19.987	22.281	22.734
Senegal (P)	USD	1.000	1.000	1.000
Russia	USD	25.732	26.423	26.960
Serbia	USD	1.000	1.000	1.000
Slovakia	EUR	2.411	2.406	2.455
Slovenia	EUR	1.943	1.793	1.829
South Africa	ZAR	80.698	105.733	107.881
Spain	EUR	17.600	13.229	13.498
Sri Lanka	LKR	127.595	130.351	130.351
Sweden	SEK	57.130	54.701	55.813
Switzerland	CHF	11.548	9.744	9.942
Thailand	THB	334.711	371.719	379.272
Tunisia	TND	4.144	1.693	1.693
Turkey	TRY	19.941	26.487	27.025
UK	GBP	18.118	13.908	14.190
Uruguay	UYU	20.226	22.786	22.786
USA	USD	111.264	111.649	113.918

20.2 Proposed Subscriptions

					Percent Change	
	Invoiced (NC 10^3)	OANDA 1st Quarter Avg Exchange Rate (1 January 2015 thru 31 March 2015)	Budget NC 10^3	Budget NC 10^3	**2016 over 2015**	**2017 over 2016**
	2015	**(NC per USD)**	**2016**	**2017**	**2016**	**2017**
Argentina	41.3190	8.8916	43.385	45.554	5.0%	5.0%
Australia	12.8331	1.2783	13.475	14.149	5.0%	5.0%
Austria	5.7990	0.9139	6.089	6.393	5.0%	5.0%
Belgium	15.9347	0.9139	16.731	17.568	5.0%	5.0%
Brazil	35.6262	1.0000	37.408	39.278	5.0%	5.0%
Bulgaria	3.1480	1.7862	3.305	3.471	5.0%	5.0%
Canada	18.5025	1.2198	19.428	20.399	5.0%	5.0%
Chile	5262.0521	611.7580	5,525.155	5,801.412	5.0%	5.0%
China-Beijing	849.0180	6.0905	891.469	936.042	5.0%	5.0%
China-Taipei	862.8732	30.8064	906.017	951.318	5.0%	5.0%
Croatia	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Cuba	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Czech Republic	129.0694	25.0308	135.523	142.299	5.0%	5.0%
Denmark	28.8240	6.8205	30.265	31.778	5.0%	5.0%
Egypt	24.4238	7.6067	25.645	26.927	5.0%	5.0%
Ethiopia	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Finland	5.2948	0.9139	5.560	5.838	5.0%	5.0%
France	29.6440	0.9139	31.126	32.682	5.0%	5.0%
Germany	44.3564	0.9139	46.574	48.903	5.0%	5.0%
Greece	2.8204	0.9139	2.961	3.110	5.0%	5.0%
Hungary	1141.7556	275.3590	1,198.843	1,258.786	5.0%	5.0%
India	26.9036	1.0000	28.249	29.661	5.0%	5.0%
Ireland	4.4766	0.9139	4.700	4.935	5.0%	5.0%
Israel	37.9117	3.9049	39.807	41.798	5.0%	5.0%
Italy	22.3252	0.9139	23.441	24.613	5.0%	5.0%
Jamaica	88.4128	113.3170	92.833	97.475	5.0%	5.0%
Japan	4708.4407	119.5100	4,943.863	5,191.056	5.0%	5.0%
Jordan	0.7086	0.7063	0.744	0.781	5.0%	5.0%
Kazakhstan (P)	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Korea-South	41.5836	1.0000	43.663	45.846	5.0%	5.0%
Kuwait	0.2801	0.3014	0.294	0.309	5.0%	5.0%
Luxemburg	0.7781	0.9139	0.817	0.858	5.0%	5.0%
Malaysia	37.3255	6.3076	39.192	41.151	5.0%	5.0%
Mozambique	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Nepal	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Netherlands	21.3905	0.9139	22.460	23.583	5.0%	5.0%
New Zealand	4.3294	1.3196	4.546	4.773	5.0%	5.0%
Nigeria	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Norway	41.8254	7.7180	43.917	46.113	5.0%	5.0%
Pakistan	4.1715	1.0000	4.380	4.599	5.0%	5.0%
Poland	34.8634	3.6797	36.607	38.437	5.0%	5.0%
Portugal	4.0042	0.9139	4.204	4.415	5.0%	5.0%
Puerto Rico	19.9869	1.0000	20.986	22.036	5.0%	5.0%
Russia	25.7322	1.0000	27.019	28.370	5.0%	5.0%
Senegal (P)	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Serbia	1.0000	1.0000	1.050	1.103	5.0%	5.0%
Slovakia	2.4113	0.9139	2.532	2.658	5.0%	5.0%
Slovenia	1.9427	0.9139	2.040	2.142	5.0%	5.0%
South Africa	80.68	12.0240	84.733	88.969	5.0%	5.0%
Spain	17.60	0.9139	18.480	19.400	5.0%	5.0%
Sri Lanka	127.5950	130.3990	133.975	140.673	5.0%	5.0%
Sweden	57.1295	8.5231	59.986	62.985	5.0%	5.0%
Switzerland	11.5485	0.9478	12.126	12.732	5.0%	5.0%
Thailand	334.7112	32.7699	351.447	369.019	5.0%	5.0%
Tunisia	4.1443	1.9362	4.352	4.569	5.0%	5.0%
Turkey	19.9410	2.6883	20.938	21.985	5.0%	5.0%
UK	18.1184	0.6621	19.024	19.976	5.0%	5.0%
Uruguay	20.2259	25.9560	21.237	22.299	5.0%	5.0%
USA	111.2635	1.0000	116.827	122.668	5.0%	5.0%

IUPAC Committee on Publications and Cheminformatics Data Standards

The current Terms of Reference for the IUPAC Committee on Publications and Cheminformatics Data Standards (CPCDS) appear below. As noted in Berlin, the terms of reference do not include terminology related to standards and data management. I am suggesting revising point (i) of the current terms to include some of the terminology that Jeremy Frey used when recommending that that the Committee on Print and Electronic Publications (CPEP) broaden its scope and change its name.

Terms of Reference

Current section (i)

(i) To advise the President, Executive Committee, other Standing Committees, Divisions, and Commissions on all aspects of the design and implementation of printed and electronic publications, including computerized databases of all sorts, and to promote the compatibility of electronic transmission and storage of information,

Proposed Revisions

(i) To advise the President, Executive Committee, other Standing Committees, Divisions, and Commissions on all aspects of the design and implementation of printed and electronic publications, including computerized databases of all sorts, and to promote the compatibility of **the** electronic transmission**, storage, and management of digital content through the development of standards for the creation of a consistent, global framework for human and machine-readable chemical information.**

Remaining sections (no change):

(ii) To make recommendations to the President and the Executive Committee on matters of policy and procedures related to the production and dissemination of printed and electronic publications,

(iii) To advise the Secretary General and the Executive Director on hardware and software requirements for the Secretariat and on the development and operation of its computer systems,

(iv) Subject to approval by the President and the Executive Committee, to establish Advisory Boards, Subcommittees, and Working Groups as needed to carry out specific functions of the Committee.

IUPAC Evaluation Committee

Summary

The Evaluation Committee has examined its current Terms of Reference and recommends that significant changes be made. We also recommend that the title of the Committee be changed to the Project Evaluation Committee.

The current Terms of Reference for the IUPAC Evaluation Committee are:

- (i) To determine the appropriate criteria for retrospective evaluation of each project.
- (ii) To evaluate all projects for conformance to plan.
- (iii) To evaluate the impact of projects on the relevant chemical community.
- (iv) To report to the Bureau, in writing, annually on the results of the evaluations done.
- (v) To inform, after discussion in the Bureau, the National Adhering Organizations of the completed evaluations.

These essentially require that members of the Evaluation Committee examine every project in detail and review its progress and outputs. This is totally impractical on two grounds. First, the sheer number of projects that are being undertaken by IUPAC Divisions and Committees is such that a small group like the Evaluation Committee simply cannot undertake such a huge task. Second, the breadth and depth of IUPAC work is such that the Evaluation Committee simply does not have the expertise required to be able to critically assess the projects.

Past incarnations of the Evaluation Committee have adopted different approaches in attempting to deal with this issue. Under the chairmanship of Ron Weir, the Evaluation Committee undertook a detailed analysis of a sample of projects. The results were presented in a 2009 report which concluded that the Project System was working appropriately. More recently (2013), under the chairmanship of Stan Penczek, a statistical analysis of IUPAC projects concluded that based on the distribution of projects through IUPAC Divisions and Committees, and the geographical spread of Task Group participants, the portfolio of IUPAC projects seemed appropriate for IUPAC.

The current Evaluation Committee believes that the Terms of Reference need to be adjusted, both to make them practically achievable and to better serve the needs of IUPAC. In our view, the key issues that will need to be addressed are: to find ways of better closing the feedback loop so that lessons learned from past and current projects can help the Project Committee make better decisions about future projects; and to provide mechanisms through which the response of the Project System to strategic initiatives can be assessed and improved.

Key steps along this path will include:

- establishment of a mechanism to undertake on-going statistical analysis of project area and Task Group membership
- examination of the final reporting requirements related to project completion, particularly with a view to identifying lessons to be learned in relation to achieving successful and timely completion of projects

- providing more transparent reporting mechanisms to chart project progress, and the expectation that Task Group chairs will report progress on a six month basis through their project web-page (a mechanism to allow chairs privileges to make such changes will need to be put in place)
- examination of the degree to which projects (and the project portfolio) responds to strategic initiatives of the Union.

The Evaluation Committee will liaise with the Secretariat in order to plan and execute the steps along this pathway.

As a result of these initiatives, we would like to recommend the following draft Terms of Reference:

Revised Terms of Reference

- (i) To monitor statistical data on the nature and breadth of project portfolio and the geographical spread of Task Group participation.
- (ii) To examine project completion reports, identify lessons to be learned, and liaise with the Project Committee..
- (iii) To collect and analyse reports from Task Group Chairs, Divisions, and Committees on responses to strategic initiatives of the Union.
- (iv) To report to the Bureau, in writing, annually on the results of the evaluations done.
- (v) To inform, after discussion in the Bureau, the National Adhering Organizations of the completed evaluations.

We also recommend that the Project Committee consider making changes to the Project Submission Form so that:

- IUPAC Strategic Initiatives are listed (and altered as required from time to time), with the expectation that a project's relevance to such initiatives can be highlighted.
- Appropriate statistical information can be gathered through the form (and this may be done automatically if the form was migrated to an on-line format)

Richard Hartshorn
Chair, IUPAC Evaluation Committee
25 February, 2015