

# INORGANIC CHEMISTRY DIVISION COMMITTEE OF IUPAC

## Minutes of Meeting at Cologne 6 and 7 September 2012

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## INORGANIC CHEMISTRY DIVISION COMMITTEE OF IUPAC

Meeting at Cologne, Germany September 6 -7, 2012

### DRAFT MINUTES

**Attendance:** Present were *President*, Robert Loss (Australia); *Vice President*, Jan Reedijk (Netherlands); *Secretary*, Markku Leskelä (Finland); *Titular Members*: Norm Holden (USA), Pavel Karen (Norway), Sanjay Mathur (Germany), Edit Tsuva (Israel) and Lars Öhrström (Sweden); *Associate Members*, Tiping Ding (China/Beijing), Javier Garcia-Martinez (Spain), Adam Kilic (Turkey), Daniel Rabinovich (USA), and Rose-Noelle Vannier (France) *National representatives*, Henrique Toma (Brazil).

**Apologies** were received from *Titular Member* Milan Drabik (Slovakia), and Ken Sakai (Japan) who could not attend.

#### 1 – Introductions and announcements (R. Loss)

The meeting commenced at 9:30 a.m. on Thursday, Sept. 6, 2012. Prof. Mathur welcomed to participants and introduced University of Cologne, Department of Chemistry and city Cologne. Div. Pres. Loss welcomed the members who introduced themselves and described their professional affiliations and areas of expertise.

#### 2 – Presentation and discussion of the Agenda (Loss)

The previously distributed Agenda was accepted by President Loss with the addition of issues related to next year Istanbul General Assembly and the question of young observers in particular..

#### 3 – Approval of Minutes from Division Meeting in Puerto Rico (Loss)

These Minutes had been distributed in draft form previously and amended according to corrections and comments received from the Division members. The final copy has been available on the IUPAC Division II web page and was in addition distributed by email to the Division members two weeks earlier by Markku Leskelä. The final version of the Minutes was approved without further change.

#### 4 – Report on the status of the action items from the San Juan meeting (Loss)

The action items from the San Juan meeting were included in the Minutes of that meeting as Appendix 1. All of these items had been addressed by the designated individual. Öhrström agreed to note the Action Items for the current meeting, which are included in these Minutes as **Appendix 1**.

#### 5 – Report on the Spring 2012 IUPAC Bureau Meeting (Loss)

Bob Loss showed first the organization of IUPAC and the location of the Division in the scheme. The structure of IUPAC is complicated. There is a union of scientific unions called ICSU (International Council for Science) which acts at global level. The collaboration between different unions is desirable and that was discussed. IUPAC and especially Div II has close relations to IUPAP because of the collaboration in validation and naming of new elements

The Bureau and Division Presidents met in Leiden, The Netherlands on April 2012 hosted by Royal Dutch Chemical Society. A copy of the Report on Division II that Div. President Loss presented to the Bureau is attached to these Minutes as **Appendix 2**.

Loss reviewed the main items that were discussed at this meeting, including concerns about young observer program, new arrangements for 2013 in IUPAC, and the possible review IUPAC structure and naming.

There was also a meeting with the IUPAC president (Kaz Tatsumi) and secretary general (Rene Deplanque). The following items came up:

- IUPAC is pleased with the high level Div II activities
- focus on improvement of IUPAC processes
- copyright clearance problems when developing IUPAC educational materials
- IUPAC's own copyright issues are one problem

Other topics of interest discussed at the Bureau meeting were:

- Reflection of IYC and how to keep the momentum, water project
- Discussion from Istanbul (2013), Seoul (2015) GA meetings – all on track
- Bids have been made for 2017 (Melbourne, Rio, Nigeria), and 2019 (Beijing, Paris)
- The Project committee continued to call for suitable projects (92% projects funded of available 2010-11) especially strategic fund
- Discussions on new website. Secretary general keeps this as top priority for this biennium
- The former IUPAC president Moreau called for more inter scientific union involvement.

The value of Strategic funds are increasing. IYC used some of these funds but overall IYC was successful and economically neutral. New special projects for strategic funding are welcome

Javier Garcia reported the topics of the discussions in the Bureau meeting:

- How to maintain the momentum of IYC in the coming years
- Situation with publisher of Pure and Applied Chemistry
- Dr. John D. Petersen was nominated as the next Executive Director of IUPAC. Petersen will succeed Dr. Terrence A. Renner who will retire at the end of this year. The new appointment will be effective 1 August 2012.

Bob Loss reported from the topics of the discussions carried out in division presidents meeting:

- How to better disseminate the results of the projects
- How to increase the impact of the projects. Presentation of posters can be one way. Fabian Meyers has suggested a call posters for Istanbul meeting. (Appendix 1)

Henrique Toma remained that 2013 is 100 years anniversary of Werner's Nobel prize – how to recognize that ? Maybe this could be accomplished at a lecture in the Istanbul meeting. (Appendix 1)

## **6 - Report from IUPAC Officers – (if present)**

No officers were present.

## **7- Reports from Other division representatives (CCE, COCI, ICTNS Garcia, Leskela, Holden)**

Javier Garcia presented Committee for Chemical Education activities: activities during IYC and the young ambassador in chemistry program.

In IYC CCE was heavily involved with the International Global Water experiments. Javier showed the video made by CCE. This experiment was the largest and most successful such activity in which UNESCO supported the distribution of experiment kits for free to developing countries. CCE off-year meeting was held in Rome in July. The commission has a new chair from Taiwan and secretary from The Netherlands. One of the activities of CCE is the Young ambassador in chemistry program.

Markku Leskelä presented news from the off-year meeting of COCI held in Toronto, Canada in June. COCI has also held regional meetings and because they have been so successful the program will be continued. COCI meeting made a follow-up of the 2011 WCLM (World Chemistry Leadership Meeting) and planned program for the 2013 WCLM. First Tales nano prize were presented in Munich in March. The Safety program has continued and new host companies are actively being sought. COCI wants to make summary of IYC activities and what may have changed in public-private collaboration and collaboration with chemical societies because of the IYC. The Company associate program was discussed and the low number of companies from Europe and Americas is a concern.

Norman Holden gave the report on the Interdivisional Committee on Terminology Nomenclature and Symbols. The report is in **Appendix 4**.

## **8-Report on status of “information packet” for new Committee members (Garcia)**

New members have been sent the latest package earlier this year by Jan Reedijk . The latest issue of the Div II news letters is sent with the welcome package. New members are asked to send their photographs and short text on their research interest to Jan Reedijk. Jan Reedijk takes care of the welcome package. It was suggested that the package could contain the list of active projects.

Division members were satisfied with the present content of the information packet..

## **9-Report from the status of the new elements (Loss)**

Fl and Lv were approved by Bureau and published in Pure Appl. Chem. 84 (2012) 1669-1672.

New IUPAP/IUPAC working party put out a call for investigation of new elements earlier this year. Some 20 publications are considered. Information has been received for atomic numbers 113,115,117 and 118. There is a possibility for element 120. Now we are waiting final report by working party.

Bob Loss told about the interesting communication with a French school. He as Div II President was asked to send a letter to Dmitry Mendeleev, their mascot for the project.

## **10-Report on the 2011 IUPAC WCC (Garcia, Reedijk)**

The World Chemistry Congress 2011 was organized simultaneously with general Assembly. WCC has also many (overlapping) symposia and all this means small problems. Many people were required to constantly move from the GA meetings to WCC symposia and within the different symposia. The same problem occurs with division and committee meetings where members have to go from one room to the other frequently. Off-year meetings were considered useful because there is time to sit together and discuss matters thoroughly all with the same group.

WCC 2011 was of very high level. The program had 3 Nobel laureates as key note speakers. Many parallel sessions held on topics where traditional walls were broken. Topics included nanomaterials, nanomaterials for energy applications, and different bio related topics. The wish was that the WCC in Istanbul could have something similar

The tentative dates for the Istanbul meeting are:

August 9-10 Division meeting

August 10-11 Committee meetings

August 8-15 47<sup>th</sup> General Assembly

August 11-16 WCC

It is recommended to have as many project meetings as possible during the GA and Division meeting to save travel costs.

## **11-Reports Review of Division budget allocations and expenditures (Loss)**

R. Loss presented the budget and expenditures of different divisions. Div II has still significant funds left to support new proposals.

Project funding – biannual project expenditure for 2010-11 was USD\$42800 (spent on 4 projects), expenditure so far for 2012-13 was \$US13800.

It was agreed to use any administrative funds available to support AMs to attend Istanbul 2013.

## **12-Report from the International Subcommittee on Materials Chemistry, ISMC (Mathur)**

Sanjay Mathur presented a short history of ISMC: why it is needed, what has been done. ISMC has been dominated by the Div II people but now polymer chemistry division is also active and Chris Ober is the chairman. There are as yet no representatives from Div. III, VIII or industry.

Sanjay Mathur highlighted the ISMC meeting held in San Juan 2011. He also went through the action items of the meeting and presented possible project topics, which were discussed in 2011. They include:

Nomenclature

Photoactive materials

MOFs (metal-organic framework)

Teaching materials chemistry

Measurement standards and references in H<sub>2</sub>O splitting  
Methodology aspects/standardization

ISO has an ISO TC229 JWG Task group on Nomenclature of nanomaterials. This was also presented and discussed in San Juan meeting. IUPAC-ISO discussions needs to link more closely in many areas but especially in nanomaterials. Numbering systems for nanomaterials are badly needed. A proposal was made: Assign a subgroup to write up section of Task report discussion to various numbering system options.

Starting of a nanomaterials definition project was discussed. ISO has already made a long draft. ISMC could start from that and collect the exiting definitions of nanomaterials and do suggestions.

The ISMC had a separate meeting in Cologne (Sept. 7-8) after the Div II meeting.

### **13 - The Division newsletter (Reedijk)**

Jan Reedijk presented briefly the content of next newsletter:

IYC follow ups

Project updates

Messages from the members –conferences, news etc.

Links to Istanbul and Werner's symposium

International Year of Crystallography 2014

Division members – their pictures and information regarding their research areas. – these should be sent to Jan asap.

### **14 - Reports on recent and planned Division sponsored conferences (Loss)**

Bob Loss reported the conditions of IUPAC for sponsoring conferences. IUPAC has clear rules to sponsor or label the conferences. IUPAC expects some representative to open the conference. Now also an IUPAC lecturer is recommended. The financial support is not unspecified cash support towards the budget of the conference but ~20 % goes to support the lecturer and ~80 % to support participation of the young participants. Timeline for applications is generally around 2 years.

Div II has had in the past supported the conference series: High Temperature Materials Conference. This triennial Conference was last held on 14-18 September 2009 in Davis, California and a report on that meeting was included in the Minutes of the Glasgow Division meeting. The next conference in this series, HTMC XI, is scheduled for 2012 in Beijing, China. Unlike in the past, there are currently no Division members who are associated with this Conference.

The last Workshop on Advanced Materials (WAM) was held in Stellenbosch, South Africa in 2005, and WAM IV was originally planned for 2008; however, these plans fell through and Mathur had agreed to try to revive this series and find an alternative location and conference organizer. Subsequent efforts to revive this series and to find a suitable organizer and location were undertaken by the Interdivisional Subcommittee on Materials Chemistry, but have thus far

proved unsuccessful.

### **15- Report from Commission on Isotopic Abundances and Atomic Weights (CIAAW) and its Subcommittees (Loss)**

Bob Loss reported on the recent Commission meeting in Calgary, Canada (July 27-28, 2011). The Commission spent considerable time on the ongoing Project on the Periodic Table of the Isotopes that was featured in an article published in Chemistry International as well as a separate pull-out (Vol. 33 No. 2 and Vol. 33 No. 4). This Table will play a key role in education and outreach to inform students that chemical elements are made up of stable isotopes and unstable isotopes, while displaying their properties and applications in everyday experiences.

Increased activity in the isotopic abundance community had necessitated the Subcommittee on Isotopic Abundance Measurements (SIAM) reviewing some 82 peer reviewed Publications of which 15 were considered suitable for further assessment. Based on this, SIAM recommended the Commission change the standard atomic weights of 5 elements. These atomic weights will be included in a new Table of Standard Atomic Weights, which will be submitted for publication to PAC.

The Subcommittee for Natural Assessment of Fundamental Understanding (SNAFU) presented work being done to assist users in the use of the new atomic weight intervals and accompanying figures. The Commission recognized that education of the user community is essential for future understanding of the atomic weight intervals, which reflect the fact that many atomic weights are not constants in Nature.

In response to a question, Loss noted that the Commission receives no direct support from IUPAC, instead relying mainly on Projects to support their meetings. When CIAAW have spent all of their Project funding and it is justified to the Treasurer, CIAAW can apply to the Division for support from the notional 30% of the Division budget which is recommended to be spent on Administrative costs.

### **16 -Review of project status (Rabinovich)**

Rabinovich presented the overview how the projects are formed and rules for projects as well as submission and approval process.

The project situation was reviewed.

#### Part I: Review of Funded Projects

Current Division II Budget

Total biennial allocation: USD 55,200

Operations (USD 1,834) & Commitments (USD 42,800) as of 1-Jan-11: USD 44,634

2009-025-1-200, Wieser/Meija, USD 2,500 \*\* Assumes \$2500 from Div V – not yet approved

2009-026-2-200, Berglund USD 6,000

2009-027-1-200, Brand, USD 9,600

2009-029-1-200, Hirata, USD 13,200  
2009-045-1-200, Ishida USD 8,000  
2009-046-2-200, Kaiser USD 1,500  
2010-003-1-200, Öhrström USD 2,000

Last periodical project report on Project 2008-040- 1-200; “Towards a comprehensive definition of oxidation state”; Karen USD 4,200, was submitted August 2012. Karen described the main points of the report and this was followed by a brief discussion.

### **17-Report of nominating committee for the 2013 Division election (Reedijk)**

Jan Reedijk explained the election system of the Division. First there is a nomination committee which consists of 4 persons – 2 from division (Holden, Reedijk), 2 former members (Coplen, Suh). Then there must be double the number of candidates for each of the positions. At the moment 4 new titular members needed. 7 positions are for AMs. New candidates are expected from NAOs. Currently 15 candidates have nominated and more new names can be forwarded to the nomination committee. In addition the committee itself can nominate candidates.

In Div II we have 3 areas (atoms, molecules, materials) and a balance between the areas should be considered when electing new members.

In 2013 the numbers of Young observers is expected to be only ~1-2 representative per division which is about  $\frac{1}{2}$  to  $\frac{1}{3}^{\text{rd}}$  of the usual number. The Division should try to push IUPAC to put more financial support for this action.

### **First day of the Meeting was ended at 5.15. Bob Loss thanked Sanjay Mathur for the excellent arrangements and hospitality.**

The evening program involved guided tour in downtown Cologne and dinner.

### **Friday Sept. 7**

Javier highlighted new properties of IUPAC website. It is possible to find and engage with all newly proposed IUPAC recommendations before being ratified by IUPAC. The pages also contain virtual colloquiums from several areas. Div. II has been active in colloquium of Periodic Table. It is possible to comment the papers and for example the Periodic Table paper has attracted plenty of comments.

R. Loss highlighted the key aspects of IUPAC projects – ideas of projects, roles of task group and the Division and went through the official project proposal form.

### **18-Ideas for possible new Projects:**

Daniel Rabinovich: Periodic Table of Life: Bioinorganic chemistry – the role of elements and inorganic compounds in biological systems. Topic is very interdisciplinary. Div II,



CCE maybe Div VII. Subject was earlier neglected by IUAPC. Idea is to develop and interactive Periodic Table where the role of elements in biology is highlighted. Recommendations were given to the topic and task group. Maybe it is possible to start with a small project – limited amount of elements or application areas.

#### Definition of nanomaterials

Pavel Karen: Definition of valence. Currently there is no clear definition and many are contradictories. The Gold book has a definition but a pre-project analysis is recommended to further study the issues.

Toma: Periodic table of allotropy of elements. Engineering of topical Periodic table. Preliminary study what is already in tables and is there need improvements. Carbon could be one excellent example element.

Reedijk noted that he has frequently encountered errors in the online encyclopedia, Wikipedia, relating to inorganic chemistry and inorganic nomenclature in particular. Given the wide use of Wikipedia among students and the general public, it is important to insure that the information presented is consistent with IUPAC accepted definitions and terminology. A Project designed to search for such errors and submit corrections might be worth pursuing.

Action item: has something happened after the San Juan meeting?

## **19 - Other Business**

No other businesses

### **Next meeting**

Next meeting of the Division will be held in connection to the GA in Istanbul. The tentative dates for the division meetings are August 9-10, 2013.

**The meeting in Cologne was very successful and the practical organizations were outstanding. The Division addressed the warmest thanks to Sanjay Mathur for taking such a good care of us.**

## Appendix 1

### Division II action items from Köln off-year meeting 2012

1. Alfred Werner Nobel Prize centennial 2013 activity? [→Reedijk] DONE; Lecture of Prof. Peter Sadler (University of Warwick, UK) will address this.
2. Contact Secretariat (Fabienne Meyers) about poster session for IUPAC projects. [→Loss]
3. Chemistry International article/news item to Secretariat (Fabienne Meyers). [→Leskelä]
4. New members send information on how to improve the welcome package to Reedijk and Garcia-Martinez. [→New members]
5. Travel funds for associate members to Istanbul GA & WCC. [→Loss]
6. Proposal for nanotechnology project(s) within Interdivisional Subcommittee on Materials Chemistry. [→Mathur]
7. Newsletter items for Reedijk in October. [→all]
8. Contact Xiangkun Zhu about status of project 2007-029-1-200. [→Ding]
9. Contact chairs or other task group members about status of projects without recent updates, especially formally expired projects. [→Rabinovich]
10. Work to increasing the number of Young Observers for 2013 GA/WCC. [→ Loss]

## Appendix 2

### IUPAC: INORGANIC CHEMISTRY DIVISION (II) Report to Leiden Bureau Meeting – April 2012

#### 1. Members (2012-2013)

**President:** R. D. Loss (Australia), **Past President :** K. Tatsumi (Japan)

**Vice President:** J. Reedijk (The Netherlands), **Secretary:** M. Leskelä (Finland)

**TM:** N. Holden (USA), P. Karen (Norway), S. Mathur (Germany), K. Sakai (Japan), L. Öhrström (Sweden), E. Tshuva (Israel), M Drabik (Slovakia).

**AM:** J. [Buchweishaija](#), (Tanzania), D. Robinovich (USA), A. [Kiliç](#), (Turkey), R-N, [Vannier](#) (France), J. Garcia Martinez (Spain), T. Ding (China),

**NR:** Y. Abdul Aziz (Malaysia) A. Saqib (Pakistan) (Uruguay), V. Chandrasakehar (India), B. [Prugovečki](#) (Croatia). H. Toma (Brazil), N. Trendafilova (Bulgaria), S. [Youngme](#), (Thailand).

#### 2. Commission and Subcommittees

- \* Commission on Isotopic Abundances and Atomic Weights (II.1), Chairman: W. Brand
- \* Subcommittee on Isotopic Abundance Measurements, Chairman Hirata Takafumi
- \* Subcommittee on Stable Isotope Reference Material Assessment, Chairman W. Brand
- \* Interdivisional Subcommittee on Materials Chemistry, Chairman: M. Leskelä

#### 3. Operations

1) Division II covers the following three areas in general “Inorganic Chemistry”.

##### 1-1) *Atom: Isotopic Abundances and Atomic Weights:*

The “Atom” members in our Division have continued to be active and productive both inside and outside of IUPAC. These members are closely association with the Commission on Isotopic Abundances and Atomic Weights, and the Subcommittee on Isotopic Abundance Measurements, and most are involved in current and proposed projects. The Commission’s primary role is to publish evaluated isotopic compositions of the elements and their atomic weights. Steady improvements in isotopic measurement technologies and techniques have resulted in increasing numbers of publications of higher resolution isotopic composition data. A major outcome of these developments and a number of subsequent evaluations was that at the 2011 Calgary meeting of the Commission it was recommended that the atomic weights of It was recommended that the atomic weights of the elements magnesium, germanium, bromine, indium and mercury should be changed to the values or the intervals 24.3040 - 24.3061, 72.630(8), 79.901 - 79.907, 114.818(1) and 200.592(3), respectively, where the number in parentheses represents the uncertainty in the last digit quoted of the preceding value.

The Commission has continued to pursue the development officially published Table of Standard Atomic Weights (TSAW) would use ranges rather than uncertainties. The latest Atomic Weights of the Elements (2009) was published on line December 12 2010, and

subsequently in PAC (Berglund and Wieser PAC 83[2] 397-410) on January 14 2011. This Technical Report, and in particular the non-constancy issue of a number of atomic weights, attracted significant media and on line attention and was reported in many major hard copy and online newspapers and websites. At the height of interest the non-constancy of atomic weights aspect was being simultaneously reported as a "Period Table Make-over" across more than 400 unique websites globally, creating valuable publicity for IUPAC and the IYC.

The A web-site for the interactive IUPAC Periodic Table of the Isotopes has been constructed at the National Nuclear Data Center, Brookhaven National Laboratory for use in the pilot study of educational materials on isotopes for the educational community. Significant input to the data-base by Dr Holden is acknowledged.

The Division is in preparation for the off-year meeting in Köln in September of 2012 hosted by TM (Sanjay Mathur). The key objectives of the meeting are; to bring new members of the Division up to speed with Division operations, review existing projects and to develop and promote New Projects particularly in the area of Molecules and Materials.

#### *1-2) Molecular Inorganic Chemistry:*

The majority of Division members belong to the "molecules" area, including coordination chemistry, organometallic chemistry, bioinorganic chemistry, transition metal catalysis, etc. VP Reedijk has been selected as the IUPAC lecturer for the proposed Eurasia12 on the Chemical Science Conference to be held in Corfu in April of 2012. The conference is targeting Chemistry in Scientifically Emerging regions of the Middle East and Asia.

#### *1-3) Solid State Inorganic and Materials Chemistry:*

The members of this group are associated with the activity of the Interdivisional Subcommittee on Materials Chemistry, and with contribution from Solid State High-temperature Materials Chemistry. The Subcommittee on Materials Chemistry is exploring together with Divisions I and IV ways of expanding the significance of Materials Chemistry with IUPAC and increasing the interaction between IUPAC and the Materials Chemistry user communities. The most recent meeting of this group was held in Puerto Rico where it also was involved in sponsoring and delivering a successful Materials Chemistry Symposium in conjunction with the PR Congress.

### **4) Selected Division II project updates**

#### *4.1) State of Projects - March 2011*

As of mid March 2012, the Division has 19 (up slightly from 18 in 2011) projects on its project list. One of these is more than a year behind its original completion deadline, 7 are just past their completion deadline of 31 Dec 2011 and two of the later are, or will be, applying for an extension. In addition there are two projects in the pipe; one has been sent back from reviewers for revision.

#### *4.2 Project 2006-016-1-200, Renne: Recommendations for Isotope Data in Geosciences*

The data evaluation project performed jointly by members of IUPAC and members of the International Union of Geological Sciences (IUGS) has published an article in *Pure and Applied Chemistry* on the definition of the year in terms of the second. The article was also published in *Episodes*, the journal of the Geological Union. Following publication of the paper, the Task Group has been engaged in discussions with the Director of the Time Department of the International Bureau of Weights and Measures (BIPM) and with the representative of the International Union of Pure and Applied Physics (IUPAP) to the Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS) about some of the details in the article. A meeting is planned for this summer to resolve these issues.

The Task Group has also completed a second article that has been submitted to the journal *Geochimica et Cosmochimica Acta* dealing with the decay constants / radioactive half lives of the uranium isotopes,  $^{235}\text{U}$  and  $^{238}\text{U}$ . Final acceptance of this paper awaits some requested minor revisions by the editor.

Upon acceptance of this second publication, the joint Chemistry/Geological Task Group will submit a second Project Proposal to IUPAC and IUGS to fund work evaluating and recommending data on the decay constants / radioactive half lives for other long-lived isotopes of interest to nuclear chemistry and geochronology for the dating of materials, such as  $^{40}\text{K}$  and  $^{87}\text{Rb}$ . The IUGS members, who still have some limited funds available from the IUGS portion of this joint project, have already been working on an initial effort dealing with the  $^{87}\text{Rb}$  half-life problem in advance of the submission of the next joint Project Proposal.

#### 4.3 *Project 2007-038-3-200, Holden: Periodic Table of the Isotopes for Chemical Education (IPTI)*

The educational project performed jointly by members of Division II and members of the Committee on Chemistry Education (CCE) on the development of an IUPAC Periodic Table of the Isotopes for Chemical Education (IPTI) has published a short article and an insert to the *Chemistry International* magazine in time for the IUPAC San Juan General Assembly.

The Periodic Table of the Elements with their downloadable files of information on the basic properties of all stable and radioactive isotopes for each element, as well as some examples of the applications of isotopes of each element in everyday life is presently being hosted on a web-site of the National Nuclear Data Center (NNDC) at Brookhaven National Laboratory. The web-site is in very limited release to scientists and teachers who are reviewing the data and recommending improvements. The Table cannot be placed into general release until author and journal publisher permissions have been obtained for each one of the pictures and diagrams which illustrate the applications provided in the Table for all of the isotopes of all of the 118 chemical elements. When all permissions have been obtained, the Project will be completed and will be available for general release to the scientific community.

To obtain additional feedback for the Project, a paper is being prepared for a virtual colloquium on the International Year of Chemistry (IYC-2011) activities in conjunction with the 22<sup>nd</sup> International Conference on Chemistry Education and the 11<sup>th</sup> European Conference on Research in Chemical Education in Rome, Italy this summer. We plan to

incorporate comments received from this virtual colloquium with previous comments received from the feedback to the web-site review.

Once this Periodic Table of the Isotopes is available for general release (all permissions for use of published materials and web-site information are granted), a follow-on joint Project Proposal to help prepare teacher lesson plans and other aids for implementing this material in the classroom setting will be prepared and submitted to IUPAC for funding.

#### *4.3 Project 2009-012-2-200 Öhrström: Coordination Polymers, Metal-Organic Frameworks and the Need for Terminology Guidelines*

A publication resulting from the above Project has been selected as a CrystEngComm Hot Article! and was featured on the CrystEngComm Blog at <http://blogs.rsc.org/ce/2012/02/06/iupac-update-coordination-polymermof-nomenclature/> and was made freely available to the public for four weeks.

This was a great opportunity for the work of this project to reach a wider audience, as the blog is publicized on the journal homepage, in the CrystEngComm [table-of-contents e-alerts](#), and on [Twitter](#). The blog also enables authors and readers to exchange ideas and information about Hot Articles.

#### *4.4 Project 2008-040-1-200: Karen, Towards a comprehensive definition of oxidation state: Pavel Karen, task group*

The task was approached in three stages: 1) anamnesis, 2) case studies, 3) write up. The anamnesis in a form of several discussion documents about various aspect of the oxidation state was mentioned previously. In the past fall, the case studies of ~100 oxidation state examples were accomplished, producing PowerPoint files discussed in writing, consecutively and repeatedly between the project leader (Pavel Karen) and the two task-group members (Joe Takats and Pat McArdle).

The case studies showed several interesting features of the oxidation state, including being ambiguous or practically indeterminable in certain cases. Covering both molecules and solids, the scope required a write up of an extensive Technical Report (TR) manuscript that would deal with the history, present debate, suggested definition, suggested algorithms and illustrative examples of OS in molecules, clusters and solids, including ambiguous cases. The TR draft was ready past fall, and, since then, it is being revised. Two appendices are under write up. One deals with quantum-chemical calculations, treating atomic charges as indicators of ionicity, bond order, as well as direct ab-initio calculations of the oxidation state. The other describes the four most important approaches to electronegativity and lists numerical electronegativity scales.

As the TR write up slowed down in its discussion and revision stages an extension of this project to September 1, 2012 was requested. In that time, we expect to complete the draft manuscript of the TR and open it for discussion on the Inorganic Chemistry Forum of the IUPAC Discussion Board together with an overview of the case studies. Another task will be to produce a Recommendation (based on the TR) and write a recommendation for the Gold book website.

## 5. Other Division Activities

- *Validation of the claims for, and naming of, new elements:*

The report on elements with Atomic Numbers > 112 was submitted and sent to the laboratories for their comments on technical accuracy. The Report has since been revised by the authors and resubmitted. This is currently with expert referees and if approved for publication will be published and sent to the ECs of both IUPAC and IUPAP for approval. After that if there are any elements to which priority for their discovery is assigned the laboratories concerned will be asked to propose names, Division II will be asked to approve names after which the usual provisional recommendation will be issued and time period allowed to elapse for comment. It is possible that the process could be completed by the end of year, but the process, for obvious reasons, cannot be rushed. In the opinion of the experts it is now worthwhile setting up a new Joint Working Group and our Executive Director has met with his counterpart in IUPAP to get this underway. In so far as is known, panels from which the new JWG will be chosen by the Presidents of the Unions are now in place. There are also now claims for element 117, which will be considered as well as any unassigned from 113, 114, 115, 116 and 118.

- *Division Newsletter:* The Inorganic Division Newsletter continues to be produced with 2 editions (August 2011 and January 2012) being produced, since the Puerto Rico GA. VP Reedijk continued as editor and has been doing an excellent job and the Newsletter continues to be picked up for subsequent redistribution by several National Chemical Societies and other Divisions.

- *IYC – 2011 wrap-up:*

A number of Div II members have been involved in IYC activities

VP Jan Reedijk

Jan reported on the opening of IYC for the Netherlands on January 27. The opening was attended by a Government minister and a CEO of AKZO-Nobel, the chair of the research council (NWO), and the President of the academy of sciences. The Dutch IYC site: <http://www.jaarvandechemie.nl/nieuws-en-verslagen/artikelen/minister-verhagen-luidt-thema-jaar-chemie-in> is listing many more activities and events for the Netherlands IYC.

TM Markku Leskelä (Chairman of the Finnish IYC2011) reported as follows:

More than 70 different events were organized in Finland all over the country during IYC 2011. About 65 000 contacts were reached in these events. The year ended in December in a closing ceremony, which was called “Chemistry Night” and held in science center of Heureka. The event was a big success and between 3 pm and midnight the number of visitors was 4235. The program of the Chemistry Night consisted of lectures, workshops held by the 20+ companies, which sponsored the year, chemistry demonstrations given by the Heureka and university people. During the year we have had competitions in making soap bubbles and photographs with chemistry theme. The final competition was held and the Finland’s champion in soap bubbles was declared at Heureka. The winners of the photograph competition were also awarded and the 20 best photographs were shown in the exhibition.

CHEMFEST 2011 Western Australia (Information extracted from the Western Australian Chemistry Consortium IYC report)

To help celebrate IYC in Western Australia (WA) a WA Chemistry Consortium was formed consisting of the; WA ChemCentre , Curtin University, Edith Cowan University, Murdoch University , Parker Centre ,Pharmacy Guild, Royal Australian Chemical Institute, Scitech, Science Teachers Association of WA, University of WA, WA Museum, ScienceNetwork WA.

The consortium undertook a range of activities including an, *Ignite Your Curiosity*, a touring roadshow that travelled the State of Western Australia highlighting the achievements of chemistry and its important role in our lives. A second major activity was the “Chemshow Experience” which connected with the general public and communities through the “wow – inducing” 20 mins performance, and then informal hands on activities. These activities visited some 15 schools/towns over a distance of 4000 km of road and 4400 km of air travel.

Chemfest 2011 was held at the Curtin University Stadium, on November 12 2011. The expo included; 28 stalls from 13 organisations; An exhibition of WA Chemistry, and the RACI periodic table exhibition . A full stage program was delivered, including the Scitech *Ignite Your Curiosity* show, a special Chemistry guest speaker Dame Julia Higgins, and four West Australian chemists.

The following organisations contributed with expo stalls, activities, promotion and/or general support to deliver Chemfest 2011: Scitech, Curtin University, ChemCentre, Science Network WA, CSIRO, Royal Australian Chemical Institute, Australian Association of Cosmetic Chemists, TSW Analytical, Desalination Discovery Centre, Champion Technologies, Murdoch University, Edith Cowan University, Central Institute of Technology, West Australian School of Mines, University of Western Australia, Elementaurs.

The event was a tremendous success, with 2000 visitors attending Chemfest 2011 and consideration is being given to holding the event on an annual basis.



**FREE!**

# CHEMFEST

**Saturday 12  
November 2011**  
2.00-7.00pm  
Curtin Stadium, Curtin University  
(Kent Street North Entrance, Bentley)

**AN EXPLOSIVE CHEMISTRY  
EXTRAVAGANZA!**

**RAIN, HAIL OR SHINE,  
THIS FREE EVENT  
WILL GO AHEAD!**

**Come and Ignite Your Curiosity about  
the wonderful world of chemistry!**  
Subliming balloons, explosive experiments and  
fantastic fireworks – discover the incredible role  
chemistry has in our everyday life.  
Brought to you by the WA Chemistry Consortium  
this event includes an amazing array of shows,  
demonstrations, interactive activities that will  
amaze the whole family.  
Plus bring afternoon tea or an early supper and  
make yourself comfortable in the picnic area.

**Activities include:**

- interactive stalls
- The explosive 'ignite your Curiosity' chemistry show
- Roaming chemistry demonstrations
- Talks from local chemists
- Competitions with great prizes
- Chemistry art exhibition
- Presentation by special guest  
Dame Julia Higgins, world-  
renowned polymer scientist

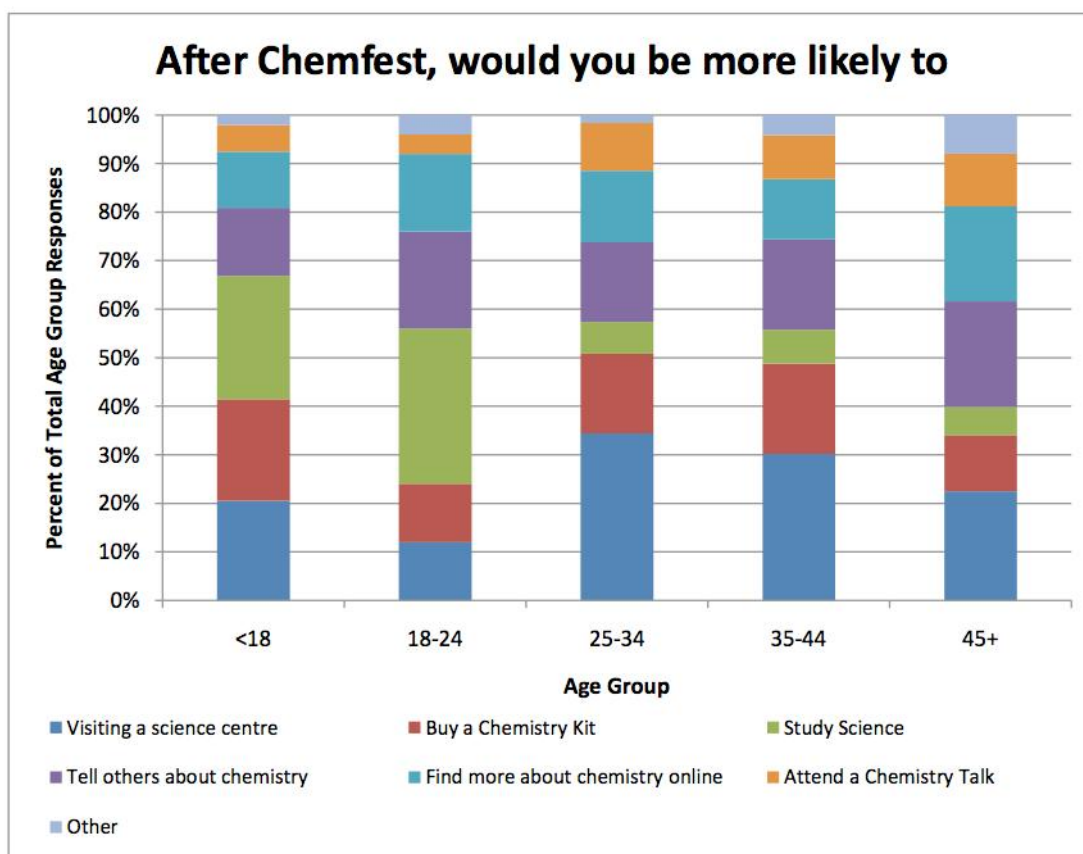
For more information visit [www.sciencewa.net.au](http://www.sciencewa.net.au)

lotterywest  
supported

scitech

IYC 2011 is supported by the WA Chemistry Consortium

Publicity Poster for ChemFest 2012.



### Appendix 3

#### Inorganic Chemistry Division Committee 2012-2013

Name Proposed	Status	Proposed Term	NAO
Prof. Robert D. Loss	TM - President	2010-2013	Australia
Prof. Jan Reedijk	TM – Vice President	2012-2013	Netherlands
Prof. Markku Leskelä	TM - Secretary	2012-2015	Finland
Dr. Milan Drábik	TM	2012-2013	Slovakia
Dr. Norman E. Holden	TM	2010-2013	United States
Prof. Pavel Karen	TM	2010-2013	Norway
Prof. Lars R. Öhrström	TM	2012-2013	Sweden
Prof. Sanjay Mathur	TM	2010-2013	Germany
Prof. Ken Sakai	TM	2010-2013	Japan
Dr. Edit Tsuva	TM	2012-2013	Israel
Dr. Joseph Buchweishaija	AM	2012-2013	Tanzania
Dr. Tiping Ding	AM	2012-2013	China/Beijing
Dr. Javier Garcia-Martinez	AM	2012-2013	Spain
Prof. Adem Kiliç	AM	2012-2013	Turkey
Prof. Daniel Rabinovich	AM	2012-2013	United States
Dr. Rose-Noelle Vannier	AM	2012-2013	France
Prof. Yang Farina Abdul Aziz	NR	2012-2013	Malaysia
Prof. V. Chandrasekhar	NR	2012-2013	India
Dr. Biserka Prugovečki	NR	2012-2013	Croatia
Prof. Natasha Trendafilova	NR	2012-2013	Bulgaria
Prof. Henrique E. Toma	NR	2012-2013	Brazil
Prof. Sujitra Youngme	NR	2012-2013	Thailand

10 TMs, 6 AMs, 6 NRs

AM = Associate Member

NR = National Representative

TM = Titular Member

## Appendix 4

### Report on the Interdivisional Committee on Terminology Nomenclature and Symbols

**Norman E. Holden**

The Interdivisional Committee on Terminology, Nomenclature and Symbols (ICTNS) met at the 46<sup>th</sup> IUPAC General Assembly held in San Juan, Puerto Rico on July 31 and August 1, 2011.

I will restrict my following comments to those items that arose at the meeting, which would be of interest to the Inorganic Chemistry Division Committee.

#### Publication Report 2009 to 2011

Summary of publications in Pure Applied Chemistry (PAC) from 2009 to July 30, 2011

PAC Volume (Year)	Articles			Technical Reports			Recommendations		
	Total Number	Total Pages	Average Pages	Total Number	Total Pages	Average Pages	Total Number	Total Pages	Average Pages
81 (2009)	13	455	37	10	250	25	3	205	68
82 (2010)	10	266	27	8	170	21	2	96	48
83 (2011)	11	357	33	8	346	43	3	11	4

Books published                      Year published                      Pages per book published  
Three books                              2010                              242 pages, 509 pages and 524 pages.

There were five IUPAC Recommendations, with two recommendations from Division II:

“Name and symbol of the element with atomic number 112”, K.Tatsumi and J. Corish

“IUPAC-IUGS common definition and convention on the use of the year as a derived unit of time”, N.E. Holden, M.L. Bonardi, P. De Bièvre, P.R. Renne and I.M. Villa

There were twenty IUPAC Technical Reports, with seven Technical Reports from Division II:

“Discovery of the element with atomic number 112”, R.C. Barber, H.W. Gäggeler, P.J. Karol, H. Nakahara, E. Vardaci and E. Yogt

“Toward defining material chemistry”, P. Day, L.V. Interrante and A.R. West

“Atomic weights of the elements 2007”, M.E. Wieser and M. Berglund

“Correction for the <sup>17</sup>O interference in δ (<sup>13</sup>C) measurements when analyzing CO<sub>2</sub> with stable isotope mass spectrometry”, W.A. Brand, S.S. Assonov and T.B. Coplen

Atomic weights of the elements 2009”, M.E. Wieser and T.B. Coplen

Isotopic compositions of the elements 2009”, M. Berglund and M.E. Wieser

Discovery of the elements with atomic number  $Z \geq 113$ ”, R.C. Barber, P.J. Karol, N. Nakahara, E. Vardaci and E. Vogt

### Call to Order of the ICTNS Meeting

Chairman Ron Weir called the meeting to order. Under business arising, he mentioned two articles whose manuscripts were not published in Pure Applied Chemistry (PAC). They were both published in other journals because of controversies with ICTNS, which could not be resolved. One was in Biochemical Thermodynamics nomenclature and databases from the International Union of Biochemistry and Molecular Biology (IUBMB) and the other dealt with the glossary of terms for relatively stable isotope ratios from Division II by T.B. Coplen. There was another controversy with ICTNS dealing with a paper by W.A. Brand, S.S. Assonov and T.B. Coplen from Division II, which was resolved and the manuscript was in fact published in PAC.

### Division Reports

Under reports from the IUPAC Divisions, A question was raised during the presentation of the report from Division I, Physical and Biophysical Chemistry, about publication of the results of an IUPAC Project in a journal other than IUPAC as “funded by IUPAC”. Does such an article have to conform to IUPAC rules? “Permission of any outcome of any IUPAC Project elsewhere than in Pure & Applied Chemistry should be given on condition of conformity with IUPAC recommendations on terminology, nomenclature and symbols”. Amelia Pilar Rauter (ICTNS associate member) recommended that this requirement should be included in the information to submitters of all project proposals. Following this discussion, the biennial report of Division I was approved.

I presented the Inorganic Chemistry Division report as presented in appendix 4 of the minutes of our Division Committee meeting in San Juan last July. There were a number of discussion points raised by Robert Wielgosz of the Bureau International des Poids et Mesures (BIPM) about the definition of the year in the report and about the selection of values and uncertainties for atomic weights in the gas metrology community in a draft BIPM report. Brynn Hibbert of the Analytical Chemistry Division and also the IUPAC representative on the BIPM Joint Committee for Guides in Metrology Working Group 1 (Guide to the Expression of Uncertainty in Measurement - GUM) complained that he was not informed by Division II on the issue of atomic weight value and uncertainty for the gas metrology community.

Gerry Moss (ICTNS titular member) questioned why IUPAC did not have a publication of isotope tables of their own but merely referred to the CRC Handbook of Chemistry and Physics annual review by Holden, which is not an IUPAC document. (I would note that IUPAC had disbanded the Commissions on Atoms and on Nuclear Chemistry over sixty-five years ago. These days, any work on atoms or nuclear chemistry must arise from project proposals submitted to Division II, which is responsible for atoms projects.) I told Moss that the Periodic Table of the Isotopes project, when it is published, would contain a

set of isotope tables of IUPAC, although not in the detail of the Handbook of Chemistry and Physics article. Following these discussions, the Division II report was approved.

#### Reports from representatives of other International Organizations and from IUPAC delegates on these International Organizations

During the BIPM report, ICTNS reiterated support for the redefinition of the SI units including the mole. Ales Fajgeli, president of Division V and the IUPAC representative on BIPM-CCQM, proposed an international project to evaluate the consequences of the new definition of the mole for various branches of chemistry. The chairman stated that all relevant divisions could be included in the project. ICTNS would judge the output of the project. Brynn Hibbert, IUPAC representative on BIPM-JCGM working group 2 on the GUM, (Guide to the expression of Uncertainty in Measurement) discussed the meeting held at BIPM May 24-27, 2011. He raised the problem of the evaluation of uncertainty associated with atomic weights at the request of IUPAC. Paul De Bièvre, IUPAC representative on BIPM-JCGM working Group 2 on the International Vocabulary of Basic and General Terms in Metrology (VIM) commented on the BIPM paper entitled “Contribution to a JCGM-WS1 Discussion of IUPAC’s definition of Atomic Weights” and drew the attention of the meeting to the fact that different groups are using the term ‘distribution’ with different meanings. De Bièvre also reported that version 3 of the VIM, VIM3 was released online on June 15, 2011 and will be published soon in Pure & Applied Chemistry. The chairman confirmed that IUPAC supports VIM3.

#### Update on status of the “color” books

Gold book – the IUPAC Compendium of Chemical Technology,

There has been no substantial change in status of the gold book. Bernardo Herold, ICTNS secretary, asked if the on-line version of the book should become a Wikipedia type project with users making comments for improvements. Jürgen Stohner, ICTNS titular member, asked if a task group should be proposed to prepare a database project for all divisions. It was concluded that the solution to the problem transcends the resources of ICTNS and IUPAC should address the problem at a higher level.

Red book – the Nomenclature of Inorganic Chemistry,

Jeff Leigh stated that the red book is on line but nothing else has been done about the red book.

#### Joint meeting of ICTNS and Commission II.1

Before adjournment, there was a meeting scheduled between ICTNS and Commission II.1. (Unfortunately, no members of Commission II.1 were in attendance at the San Juan General Assembly. IUPAC has discouraged Commission II.1 from holding their meetings at the site of IUPAC General Assemblies because of the concern about costs at the GA location. The Commission no longer receives any direct financial support from IUPAC. All funding for the Commission must come from projects proposed and submitted for approval for funding from the Inorganic Division Committee’s biennial budget.)

The Division II president Bob Loss did attend the meeting with ICTNS. Loss admitted that the Division Committee has no control over the activities and output of Commission II.1 and a manuscript not approved by ICTNS would be published elsewhere. This was, in fact, the case. The report of the ICTNS meeting ended with a rather detailed listing of four years worth of technical comments sent between either the manuscript author or the chairman of Commission II.1 and the PAC editor (ICTNS chairman) prior to the time of this meeting.