Newsletter 2017 of the Inorganic Chemistry Division Division II

Editors Note: Below you will find the 2017 Newsletter; it was compiled thanks to your kindness to send material. Please keep sending your items, including pictures, or suggested topics for future issues, via email to ohrstrom@chalmers.se. Please circulate this newsletter to your NAO:s and other interested parties. Kindest regards, Lars Öhrström.

Division II Members 2016-2017

President: Reedijk, Jan; **Vice President:** Öhrström, Lars; **Secretary:** Leskelä, Markku;
Titular members: Loss, Robert, (Past President) Armelao, Lidia; Ding, Tiping, Karen, Pavel; Rabinovich, Daniel; Walczyk, Thomas; Wieser, Michael
Associate members: Drabik, Milan;. Sakai, Ken; Trendafilova, Natasha; Meesuk, Ladda; Abdul Aziz, Farina; Colón, Jorge
National representatives: Galamba Correia, João; Kalmykov, Stepan; Mathur, Sanjay; Kiliç, Adem; Hasegawa, Miki; Knauth, Philippe; Yoon, Kyung Byung; Diop, Mayoro; Darkwa, James; Leigh, Jeffery

Division II Subcommittees and Commissions currently in operation are the following:
Commission on Isotopic Abundance and Atomic Weights Chair Juris Mejia
- Subcommittee on Isotopic Abundance Measurements
- Stable Isotope Reference Material Assessment
- Subcommittee on Natural Assessment of Fundamental Understanding of Isotopes

Interdivisional Subcommittee on Materials Chemistry Chair Vladimir Gubala

Sao Paolo GA & Division Meeting

The division meeting was slightly less attended than usual because some members didn't have the freedom to travel due to departmental or family restrictions, and others experienced severe delays because of thunderstorms in Europe. Nevertheless, the division was busy and the minutes will be distributed shortly.

We noted continued fruitful collaborations with Division (VIII) Chemical Nomenclature and Structure Representation, and the Committee on Chemistry Education. We discussed the report from the Commission on Isotopic Abundances and Atomic Weights (CIAAW, http://ciaaw.org) and the the Interactive Periodic Table and the Periodic Table of Isotopes of the Elements website http://www.ciaaw.org/periodic-table-isotopes.htm.

Historic moment at the IUPAC Council meeting during the 2017 GA, when Jan Reedijk presents the names and symbols of the four new elements, which the Council subsequently unanimously approved. (L. Soby, IUPAC Executive Director, seated)

Another important item on the agenda was the names and symbols of the four new elements, subsequently approved by the Council. The approval process may seem trivial, but is in fact highly delicate and the margin for errors is very low. This is the most publicly visible activity of the Union and both the DP and the VDP have spent some considerable time on this and related issues over the last two years.

During the Council meeting, division incoming vice president Javier Garcia Martinez lost the election for IUPAC president 2020 with the most narrow marginal possible. He was subsequently elected to serve in the Executive Committee by the Bureau. Also at the Council meeting, Ken Sakai was voted in as a member of the Bureau.

The Young Observer program during the GA is important for recruiting new talent to the Union. This year a poster session, where the divisions activities were presented, and a speed-dating session, were new successful items on the agenda. The Div. II activity poster, drafted by Daniel Rabinovich, is enclosed at the end of this newsletter.

The Young Observers from the USA share their experiences here: Young Observers Reflect on IUPAC-2017. Javier Vela attended the div II meeting.

Photos from the GA and the World Chemical Congress can be found here.

Scheduled 2018 Off-year Meeting of Division II. The Division Committee is currently discussing a meeting in Gaborone, Botswana 2-5 October 2018, back to back with a one and a half-day symposium on chemistry and IUPAC.

Project Progress & News

The division currently has around 25 active projects A few highlights are mentioned here:
2015-039-2-200 The Constitution of Group 3 of The Periodic Table This project will recommend the composition of group 3 of the periodic table as consisting either of Sc, Y, Lu and Lr, or Sc, Y, La and Ac. Within this project, we have noted a problem in the Gold Book that states "transition element: An element whose atom has an incomplete d sub-shell, or which can give rise to cations with an incomplete d sub-shell." However, incomplete d sub-shells occur in the lanthanoids and actinoids as well. Chair Eric Scerri.
2013-048-1-100 About the redefinition of the mole, somewhat convoluted entitled: A critical review of the proposed definitions of fundamental chemical quantities and their impact on chemical communities A Technical report is available: https://doi.org/10.1515/pac-2016-0808; *Pure and Applied Chemistry* 89(7), pp. 951-981 (2017). Juris Mejia has been div. II representative.
2008-040-1-200 Towards a comprehensive definition of oxidation state has been completed. The final stage was a comprehensive editing of the Wikipedia entry, a very important work, as this page is accessed on average 800 times a day! Chair Pavel Karen.

New Projects

2017-014-2-200 IUPAC/IUPAP joint working group to examine the 1991 criteria used to verify claims for the discovery of new elements, falls under div. II jurisdiction, but is composed of nuclear scientists. Chair Sigurd Hofmann. Related to this, IUPAC and IUPAP presidents, the IUPAC div II DP and VDP, and The Commission on Nuclear Physics (C12) chair, has worked on a document entitled "IUPAC and IUPAP Procedures for Validating Claims for the Discovery of New Elements and Naming those Elements" that will subsequently be published in PAC.'
2016-032-2-020 IUPAC's role in developing interdisciplinary/ collaborative work in the chemistry community and beyond - the focus for the 2017 WCLM, Chairs Hemda Garelick and Christopher Ober.
2017-031-1-050 IUPAC100 Periodic Table Challenge As a part of the 100 years of IUPAC and the 150 years of the Periodic Table, a sub project is preparing for The Global Periodic Table Competition. Division input would be appreciated in the form of potential questions. "Questions about the name, chemical or physical properties or discovery are possible. But more importantly, we also need you to provide the correct answer highlighting the role of IUPAC in that particular case or more broadly." This activity is about educating people about the work of IUPAC. Co-chaired by Jan Apotheker, and Juris Meija. You may also contact Lars Öhrström or Javier Garcia-Martinez.
In this context, we also note that:
The United Nations General Assembly has proclaimed 2019 as the "International Year of the Periodic Table of Chemical Elements". See IUPAC news 20th December 2017.

Wikipedia and Division II

All division members are urged to read and encouraged also to edit relevant pages in Wikipedia, in English or other languages. Div. II is the only division with a wiki page in English, and the daily average number of visitors 2017 has been 3. The wiki CIAAW page has more visitors, especially when atomic weights are updated. (See also Project News).

Div. IV is adding into wikipedia "IUPAC Definitions". Following this example gives us both visibility and the possibility to introduce our perspective in a simple and effective way.

Division members in the News

Javier Garcia Martinez wrote an article on the Artificial Leaf in Scientific American. A ChemViews article, *Updated Atomic Weights: Time to Review Our Table* reported on the work of the CIAAW and their latest updates. Javier was also awarded the 2018 Kathryn C. Hach Award for Entrepreneurial Success by the ACS.
Jan Reedijk wrote an invited article in Polyhedron: Row 7 of the periodic table complete: Can we expect more new elements; and if so, when?

Division II Elections for 2018-2019

The nomination committee consisted of Lars Öhrström (chair), Kazuyuki Tatsumi, (Japan, molecules, ex. div.II & IUPAC pres.) Robin Macaluso, (USA, materials, CCE & Div.VIII, former div.II YO,), Juris Meija, (Canada, atoms , ICTNS & Chair CIAAW) and Alessia Bacchi, (Italy, molecules & materials, Pres. Eur. Cryst. Assoc.) The results have been communicated by the Secretariat and the updated list of members can be found at the end of the newsletter. Notably Javier Garcia Martinez was voted in as our division vice president. Here is an interview with Javier in ChemistryViews.

We thank the former members who are retiring

or rotating off, for their services to the Union:
T. Ding (China, Bejing); R. Loss (Australia, former DP); M.I Wieser (Canada); S. Mathur (Germany); A. Kiliç (Turkey); J. Darkwa (South Africa).

IUPAC Endorsed Conferences

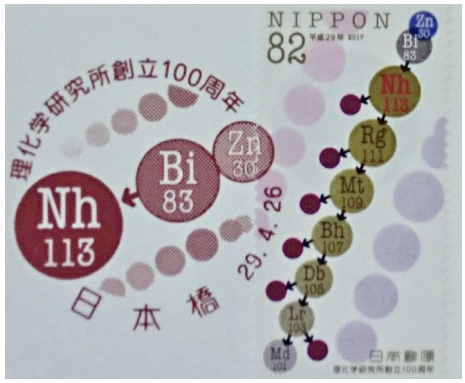
43rd International Conference on Coordination Chemistry, 30 July- 4 Aug. 2018, Sendai, Japan

The 13th Solid State Chemistry conference (SSC 2018) will be held during September 16th – 21rd in Pardubice, the Czech Republic.

IUPAC stamp expert and Division II project manager Daniel Rabinovich has notified us about the first appearance of one of the new elements on a stamp. Not surprisingly perhaps: from Japan. Second one seems to be from Armenia.

Dan's latest article on stamps, Big Chemistry, appeared in the Big Data special themed issue of Chemistry International earlier this year.

In addition, Miki Hasegawa has provided us with this unique postmark, only available in one post office in the Nihonbashi district in Tokyo. It also commemorates the 100th anniversary of the national research institute RIKEN.



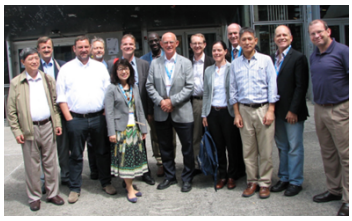
Inorganic Chemistry Division

Division II

INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY

Introduction

The IUPAC Inorganic Chemistry Division (Division II) deals with all aspects of inorganic chemistry, including materials, organometallic, and bioinorganic chemistry, and also with isotopes, atomic weights, and the periodic table. It also advises the Chemical Nomenclature and Structure Representation Division (Division VIII) on issues dealing with inorganic compounds and materials.

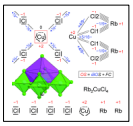


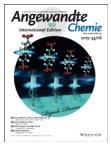
Division II meeting in Brest, France (July **2016**). L to R: Tiping Ding (China), Markku Leskelä (Finland), Thomas Walczyk (Switzerland), Pavel Karen (Norway), Miki Hasegawa (Japan), Philippe Knauth (France), Mayoro Diop (Senegal), Jan Reedijk (The Netherlands), Lars Öhrström (Sweden), Lidia Armelao, (Italy), Richard Hartshorn (IUPAC SG), Ken Sakai (Japan), Jorge Colón (Puerto Rico), and Daniel Rabinovich (USA).

Impact and visibility

For the general public, the most conspicuous outcome of the division's work is the evaluation and advise it provides pertaining to the names and symbols proposed for new elements, which have been approved for addition to the periodic table. For the scientific end educational community, the work on isotopic abundances and atomic weights is of fundamental importance as these numbers are continuously refined and updated.

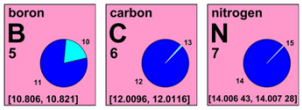
Project: 2008-040-1-200
Towards a Comprehensive Definition of Oxidation State
TGC: Pavel Karen (University of Oslo, Norway)

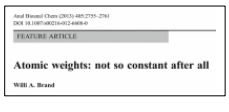




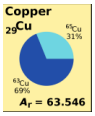
Angew. Chem. Int. Ed. **2015**, *54*, 4716-4726.

Project: 2011-040-2-200
Development a Procedure for Using Intervals Instead of Fixed Values for Atomic Weights; an Educational Exercise
TGC: Willi A. Brand (Max Planck Institute for Biogeochemistry, Germany)





Excerpt of an IUPAC Periodic Table showing the interval notation of the standard atomic weights of boron, carbon, and nitrogen (Chemistry International, IUPAC). Example: the pie chart for boron shows it to be composed of about 20% ^{10}B and 80% ^{11}B. This isotope mix causes the standard atomic weight of ordinary Earthly boron samples to be expected to fall within the interval 10.806 to 10.821.



Project: 2015-030-2-200
IUPAC Assessment of Fundamental Understanding of Isotopic Abundances and Atomic Weights of the Chemical Elements (2016—2017)
TGC: Norman Holden (Brookhaven National Laboratory, USA)

IUPAC Projects

The scientific work of IUPAC is conducted largely through a formal Project system in which proposals from chemists around the world are peer-reviewed. The records of all current and completed projects are accessible through a searchable database hosted by IUPAC (https://iupac.org/projects).

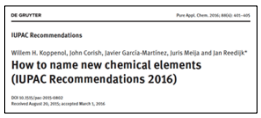
General Criteria for Projects

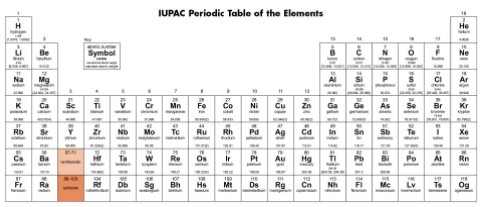
IUPAC projects should address one of the goals listed in the IUPAC Strategic Plan and satisfy at least one of the following key criteria:

- Should be related to the needs of chemists in the world, not just those in a particular country or region.
- Should be related to the role of chemistry for the needs of mankind.
- Should be best approached by an international team of experts, such as those IUPAC can assemble.

☆ Sample Division II Projects ☆

Project: 2015-031-1-200
How to Name New Chemical Elements
TGC: Jan Reedijk (Leiden University, The Netherlands)





Project: 2015-037-2-200
IUPAC Molecular Weight Calculator
TGC: Juris Meija (National research Council, Canada)

Y?
La?

Project: 2015-039-2-200
The Constitution of Group 3 of the Periodic Table
TGC: Eric Scerri (University of California, Los Angeles, USA)

Project: 2015-053-1-200
Survey of Definitions and Use of Common Solid-State Chemistry Terminology
TGC: Robin T. Macaluso (University of Texas at Arlington, USA)

Membership of the Inorganic Chemistry Division Committee 2018-2019

Name	Status	Term	NAO
Prof. Lars R. Ohrström	TM-President	2018-2019	Sweden
Prof. Jan Reedijk	TM-Past President	2018-2019	Netherlands
Dr. Javier Garcia Martinez	TM-Vice President	2018-2019	Spain
Prof. Markku Leskelä	TM-Secretary	2012-2019	Finland
Prof. Xiangkun Zhu	TM	2018-2019	China/Beijing
Prof. Lidia Armelao	TM	2016-2019	Italy
Prof. Miki Hasegawa	TM	2018-2019	Japan
Prof. Pavel Karen	TM	2016-2019	Norway
Prof. Milan Drabik	TM	2018-2019	Slovakia
Prof. Robin Macaluso	TM	2018-2019	USA
Prof. Annie Powell	AM	2018-2019	Germany
Prof. Farina Abdul Aziz	AM	2016-2019	Malaysia
Prof. Jorge Colón	AM	2016-2019	Puerto Rico
Prof. Thomas Walczyk	AM	2018-2019	Switzerland
Dr. Ladda Meesuk	AM	2016-2019	Thailand
Prof. Daniel Rabinovich	AM	2018-2019	USA
Prof. Natasha S Trendafilova	NR	2018-2019	Bulgaria
Prof. Vladimir Stilinović	NR	2018-2019	Croatia
Prof. Philippe Knauth	NR	2016-2019	France
Prof. Ken Sakai	NR	2018-2019	Japan
Prof. Mi Hee Lim	NR	2018-2019	Korea
Prof. Paweł J Kulesza	NR	2018-2019	Poland
Prof. João D Galamba Correia	NR	2016-2019	Portugal
Prof. Mayoro Diop	NR	2016-2019	Senegal
Prof. Onder Metin	NR	2018-2019	Turkey
Prof. Jeffery Leigh	NR	2016-2019	United Kingdom
	10 TMs, 6 AMs, 10 NRs		

Young Observers at the GA in Sao Paolo 2017
Javier Vela (USA)

Emeritus members on the mailing list:
Dr. Norman E. Holden, United States
Prof. Kazuyuki Tatsumi, Japan (past div II president, past IUPAC president)
Prof. Robert (Bob) Loss, Australia (past div II president)