



International Union of Pure and Applied Chemistry

Inorganic Chemistry Division (II) Newsletter 2012_1

Editors Note: Below you will find the 2012-1 Newsletter; it was compiled thanks to your kindness to send materials. So keep sending your items, including pictures, or suggested topics for future issues, preferable via email to <u>Reedijk@chem.leidenuniv.nl</u>. I can handle most formats of attachments.

Kindest regards, Jan Reedijk.

Division II Members 2012-2013

President: Loss, Robert D., Vice President: <u>Reedijk, Jan</u>; Secretary: <u>Leskelä, Markku</u>; Titular members: <u>Mathur, Sanjay</u>; <u>Drabik, Milan</u>; <u>Sakai, Ken</u>; <u>Holden, Norman E.</u>; <u>Öhrström, Lars R.</u>; <u>Karen, Pavel</u>; Tshuva, Edit Y.

Associate members: <u>Ding, Tiping</u>, <u>Garcia-Martinez</u>, <u>Javier</u>, Buchweishaija, Joseph; Rabinovich, Daniel; Vannier, Rose-Noelle; <u>Kiliç, Adem</u>;

National representatives: Abdul Aziz, Farina; <u>Trendafilova, Natasha</u>; Prugovečki, Biserka; Chandrasekhar, V.; Youngme, Sujittra; Toma, Henrique;

Division II Subcommittees and Commissions currently in operation are the following: Subcommittee on Isotopic Abundance Measurements

Interdivisional Subcommittee on Materials Chemistry Commission on Isotopic Abundance and Atomic Weights Stable Isotope Reference Material Assessment

Welcome to new Members of the Division Committee!

It is a pleasure to welcome new members of the Division Committee, some who have not served before in another capacity.



For the titular members new for our Disvion is prof. Edit Tshuva, Jerusalem. She has research interests and expertise in the field of molecular inorganic chemistry,

Milan Drabic, Markku

Leskela and Lars Öhrström, who were previous Associate Members, now will be Titular Members. Markku will be our new Secretary.



For the Associate Members of the Division Committee the newly elected are: Rose-Noelle Vannier, from Lille, France. She has expertise in the field of solid state chemistry and materials.



Joseph Buchweishaija, from Dar-es-salaam, Tanzania; he had served in the Division as National Representative before; his research interest is the area of materials.

Daniel Rabinovich, from

Charlotte, North Carolina USA; he had served as Young Observer from USA. Daniel, who is a synthetic bioinorganic chemist, will take over the Division II project administration from Tyler Coplen.





Adem Kiliç, Gebze Institute of Technology, Kocaeli, Turkey. His expertise is in the area of molecular inorganic chemistry. He also served as National Representative for Turkey in the previous period. Tiping Ding and Javier Garcia-Martinez, who both have served before as titular members, now continue as Associate Member of our Division Committee.

Finally, a number of New National

Representatives will take office in our Division Comittee, and we would like to welcome in this Newsletter the following six colleagues.

Their names, and main scientific interests and expertise, and a picture, are presented below:

Yang Farina Abdul Aziz,

from Bangi Selangor, Malaysia. She has expertise in the field of molecular inorganic chemistry.





Biserka Prugovečki, from Zagreb, Croatia. She has expertise in crystallography.

Sujittra Youngme from Khon Kaen University, Thailand, has expertise in molecular inorganic chemistry.





Henri que Eisi Toma, from Sao Paolo, Brasil; his expertise is in molecular materials. In the past he has earlier served as a National Representative.

V. Chandrasekhar, Indian Institute of Technology, Kanpur; he has expertise in the field of molecular inorganic chemistry. He also served as National Representative in the previous period.





Natasha Trendafilova from

Sofia, Bulgaria; she has expertise in theoretical chemistry. She also served as National Representative in the previous period.

Division Officers leaving:

The Division Committee owes many thanks to both former Division Secretary Len V. Interrante, and to the former project manager, Tyler Coplen.

Both of Len and Ty have served the Division and IUPAC for many

consecutive years. Len's work as Division member and especially secretary has been exemplary, and as member and Chair of the Interdivisional Subcommittee on Materials



Chemistry Len has sought to raise the profile of this important and expanding area of Chemistry.

Before coming onto the Division Ty was a member and then secretary for the Commission on Isotopic Abundances and Atomic Weights,

and also member of the Subcommittee on Natural Isotopic Fractionation. Ty will continue his involvement with IUPAC though the Subcommittee on Isotopic Abundance Measurements, and



the more recently formed Subcommittee on Stable Isotope Reference Material Assessment.

Project Planning News:

A new project, joint with Divisions VIII and IV, proposing the revision and extension of the 1984 recommendations of (single-stranded) metal-based coordination polymers has been submitted and was granted in 2011. The group will have their first meeting, on February 21, 2012 in Leiden University, NL; the convenor of the group is prof. Richard Jones from Division IV. The MOF project (convenor prof. Lars Öhrström: http://www.iupac.org/web/ins/2009-012-

2-200) reports as follows: The CP/MOF project will have a final meeting on the 24th of May, 2012, in Stockholm preceded by a one day symposium 23rd of May on "Metal-organic frameworks, porous coordination polymers and zeolites" organised in collaboration with the "Trends in Inorganic Chemistry" symposiums of the Swedish Chemical Society's Inorganic division. The symposium will feature talks by task group members Michael O'Keeffe, Arizona State University, USA, Neil Champness, University of Nottingham, UK, Susumu Kitagawa, Kyoto University, Japan, Stuart Batten, Monash University, Australia, Javier García-Martínez, University of Alicante, Spain, Xiao-Ming Chen, Sun Yat-Sen University, China (Beijing), and Myunghyun Paik Suh, Seoul National University, South Korea as well as Tina Düren, University of Edinburgh, UK and Unni Olsbye, University of Oslo, Norway. Proceedings from the meeting will be published in an open access special issue of Zeitschrift für Kristallographie, 2013. Further information on the symposium is already available at www.tinc.nu. A brief discussion type account of the task

force's work is scheduled to be published in CrystEngComm as a highlight in the beginning of 2012; see: DOI:10.1039/C2CE06488J

Meetings, Events and Conferences

International Year of Chemistry 2011 IYC

2011 indeed has been a successful year-long celebration in which many people of our division participates. The kickoff event was held in Paris, January 27-28, 2011 and the final meeting was held in Brussels, November 30, 2011.

For details see: http://www.chemistry2011.org/

The Division mentions proudly the activity started by Javier Garcia-Martinez on the very successful global project dealing with **water**: see for original plan:

http://www.iupac.org/web/ins/2010-011-1-050

A detailed report of the completed water project, is available at the website of IUPAC and for a direct hyperlink of the press release see:

http://www.iupac.org/web/nt/2011-11-30 water experiment

Duties of Division Members

Starting 2012 all division member duties (TM&AM) will be made visible in a matrix table. This is on the request of the newly elected members. A welcome package for the new members has been updated and already been distributed to all newly elected members. (*Copies are available for others, if wished so*)

The so-called **off-year meeting of Division II** will be held in 2012 at the University of Cologne (Host-organizer will be prof. Sanjay Mathur and his team), from Sept. 6 (arrival in pm), 7, and 8 (Departure day).

Full details will be in the next Newsletter, including a possible meeting on Sept. 6 for the interdivisional materials subgroup meeting,

New elements 114 and 116

Now that these new elements have been officially been recognized by IUPAC and IUPAP, the assigned discoverers now have proposes names and 2-letter abbreviations and Division II has accepted these names and symbols. Also acceptance, the Bureau by mandate of the Council has ratified the new names. Now a 5 month public review period will commence. More news is to be expected in our Fall 2012 Newsletter. See also:

http://www.iupac.org/web/nt/2011-12-01_name_element_114_116

Upcoming Conferences of interest for the Division:

The 25th conference on Organometallic chemistry in 2012 is scheduled to be in Lisbon, Sept. 2-7, 2012 and full details for registration are available at the website: <u>http://cqe.ist.utl.pt/events/icomc25/</u>

The 40th ICCC (International Conference on Coordination Chemistry) in 2012 is scheduled to be in Valencia, Spain; Sept. 9-13, 2012. The details for registration and travel are available at the website: <u>http://www.iccc40.com</u>

The 11th Eurobic (European Bioinorganic Chemistry) is scheduled for Granada. Spain, Sept. 12-16, 2012. The details for registration and travel are available at the website: http://www.eurobic11.com

Project overviews in a (clickable) Table are available on the next pages.

Recently started and ongoing Divisional projects (overview with hyperlinks)

Bunning Project of Division II	Clickable weblink	
Ctandard natantials of radicals	bttp://www.iuppo.org/uup/ing/2001.015.1.100	
Standard potentials of radicals	http://www.iupac.org/web/ins/2001-015-1-100	
I erminology for self-assembly and aggregation of polymers	nttp://www.iupac.org/web/ins/2005-043-2-400	
Recommendations for Isotope Data in Geosciences	http://www.iupac.org/web/ins/2006-016-1-200	
l erminology for conducting, electroactive and field		
responsive polymers	http://www.iupac.org/web/ins/2006-028-1-400	
Priority claims for the discovery of elements with atomic		
number greater than 111	http://www.iupac.org/web/ins/2006-046-1-200	
Evaluated Published Isotope Ratio Data (2007-2009)	http://www.iupac.org/web/ins/2007-028-1-200	
Evaluation of Isotopic Abundance Variations in Selected		
Heavier Elements	http://www.iupac.org/web/ins/2007-029-1-200	
Evaluated Compilation of International Reference Materials		
for Isotope Abundance Measurements	http://www.iupac.org/web/ins/2007-031-1-200	
Development of an Isotopic Periodic Table for the		
Educational Community	http://www.iupac.org/web/ins/2007-038-3-200	
Thermodynamic study on hydrogen storage materials: metal		
organic frameworks and metal or complex hydrides	http://www.iupac.org/web/ins/2008-006-3-100	
Towards a comprehensive definition of oxidation state	http://www.iupac.org/web/ins/2008-040-1-200	
Coordination polymers and metal organic frameworks:		
nomenclature guidelines	http://www.iupac.org/web/ins/2009-012-2-200	
Evaluation of Radiogenic Abundance Variations in Selected		
Elements	http://www.iupac.org/web/ins/2009-023-1-200	
Technical Guidelines for Isotope Abundances and Atomic		
Weight Measurements	http://www.iupac.org/web/ins/2009-025-1-200	
Assessment of Stable Isotopic Reference and Inter-		
Comparison Materials	http://www.iupac.org/web/ins/2009-027-1-200	
Evaluated Published Isotope Ratio Data (2010-2011)	http://www.jupac.org/web/ins/2009-029-1-200	
Guidelines for Measurement of Luminescence Spectra and		
Quantum Yields of Inorganic Compounds Metal Complexes		
and Materials	http://www.jupac.org/web/ins/2009-045-1-200	
Terminology and definition of quantities related to the isotope		
distribution in elements with more than two stable isotopes	http://www.jupac.org/web/ins/2009-046-2-200	
Online evaluated isotope ratio database for user communities		
(2011-2014)	http://www.jupac.org/web/ins/2009-026-2-200	
	<u>mup.//www.lupdo.org/wcb/m3/2003-020-2-200</u>	

Status project Division August 2011

Report from the Commission on Isotopic Abundances and Atomic Weights (CIAAW)

The Commission has provided an example of a figure (1 of 118 for each of the 118 elements) that will appear as part of Project No. 2007-038-3-200: Development of an isotopic periodic table for the educational community (see http://iupac.org/web/ins/2007-038-3-200). We reproduce here a sample page for Mercury.



Stable	Atomic mass*	Mole
isotope		fraction
¹⁹⁶ Hg	195.965 833	0.0015
¹⁹⁸ Hg	197.966 769	0.0997
¹⁹⁹ Hg	198.968 2799	0.1687
²⁰⁰ Hg	199.968 326	0.2310
²⁰¹ Hg	200.970 3023	0.1318
202 Hg	201.970 643	0.2986
204 Hg	203.973 4939	0.0687

* Atomic mass given in unified atomic mass units, u.



Important applications of stable and/or radioactive isotopes

Isotopes in medicine

¹⁹⁷Hg and ²⁰³Hg are radioactive isotopes that are both used to study brain and kidney function. ¹⁹⁷Hg or ²⁰³Hg is injected into the patient's body and the isotopes travel to these organs giving off gamma radiation that can be detected by instruments positioned above the body. The pattern of radiation given off provides information as to how well these organs are functioning.



Isotopes used as source of radioactive isotope(s)

The isotope ²⁰²Hg can be used to produce radioactive ²⁰³Hg to be used in gamma radiation calibration and medical tests.

Figure 1: ²⁰²Hg is being added to ELA to study the fate of mercury from atmospheric deposition in pristine lakes as part of the METAALICUS study. (Photo Source: Toxic Substances Hydrology Program, U.S. Geological Survey).

Isotopes in earth/ planetary science

¹⁹⁸Hg, ²⁰⁰Hg and ²⁰²Hg are stable isotopes that can be used in emission and deposition studies of Hg in aquatic and terrestrial ecosystems. For example, in an ecosystem, different isotopes of mercury can be added to an upland region for run-off evaluation, to a lake for direct deposition analysis and to a wetland region for outflow contribution analysis. As a result, it is possible to determine the entry routes of mercury into an ecosystem and how these different entry routes can affect Hg accumulation in local fish populations. An international consortium of scientists has begun an experiment called METAALICUS, which stands for Mercury Experiment To Assess Atmospheric Loading In Canada and the United States, to determine if mercury contamination in fish is old or new mercury. This experiment takes place in northwestern Ontario at the Experimental Lakes Area (ELA) of the Department of Fisheries and Oceans Canada.