



17th Radiochemical Conference – RadChem 2014 Mariánské Lázně, 11-16th May 2014

The 17th Radiochemical Conference – RadChem 2014, was held in the Casino conference centre in Mariánské Lázně, Czech Republic, on the 11-16th May 2014. As usual in its more recent history, the conference was co organized by the Department of Nuclear Chemistry, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague (DNC FNSPE CTU), Czech Chemical Society, and Ioannes Marcus Marci Spectroscopic Society. Together with the “International Conference on Nuclear- and Radiochemistry (NRC)” series, the RadChem series form the pillars of the pan-European conference series organised on behalf of the Division of Nuclear and Radiochemistry of the European Association for Chemical and Molecular Sciences (DNRC EuCheMS). Traditionally, RadChem 2014 was organised in cooperation with the International Atomic Energy Agency (IAEA) and was sponsored by the International Union of Pure and Applied Chemistry (IUPAC). Over its 50+ years long tradition, the conference has gained a good reputation among the researchers in the field of nuclear- and radiochemistry as a platform for the presentations of research results and for the discussions about current issues. It offers a great opportunity to establish new contacts with local and foreign colleagues, especially for young researchers and students.



The conference was attended by 320 participants from 43 countries from all parts of the world, from which the most represented countries were the Czech Republic, Russia, Germany, Poland, the USA, Japan and Korea. In total, 413 contributions were accepted for the presentations. The scientific programme was accomplished, except for the plenary lectures, in two parallel sessions. The programme of most of the sessions was opened with invited lectures. The poster presentations were organised into topical sessions and spread over three days to give the participants ample time for the discussion with the authors.

The conference covered most of the topical issues in the field of nuclear- and radiochemistry in a total of nine sessions including, among others, radioecology, i.e. the behaviour of radioactive species in the environment, their diffusion, concentration, disposal or their impact on public health; and the radiochemistry application in medicine, especially the production of labelled compounds and radiopharmaceuticals. Other sessions were devoted to radioanalytical methods, radiochemical problems in nuclear fuel cycle, radionuclide production, ionising radiation applications, separation and speciation methods, and to the chemistry of

Division members

Prof. Mauro Bonardi (Italy)
Head of Radiochemistry Laboratory,
LASA
Via F.lli Cervi,
20090 Segrate
Milano, Italy
mauro.bonardi@mi.infn.it

Prof. Alexander Chekmarev (Russia)
Russian D Mendeleev University of
Chemical Technology
Miusskaya Sic9, 125190 Moscow, Russia
chekmarv@rctu.ru

Dr Divna Džokić (Serbia)
The Vinča Institute of Nuclear Science
PO Box 522, 11001 Belgrade
Serbia and Montenegro
djokici@vin.bg.ac.rs

Dr Nick Evans (United Kingdom)
Chairman of DNRC
Department of Chemistry,
Loughborough University
Ashby Road
Loughborough, Leics
LE11 3TU, UK
n.d.m.evans@lboro.ac.uk

Prof. Andreas Türler (Switzerland)
Paul Scherrer Institut
5232 Villigen, Switzerland
heinz.gaeggeler@psi.ch

Prof. Horst Geckeis (Germany)
Karlsruhe Institute of Technology
Institute for Nuclear Waste Disposal
P.O.Box 3640
D-76021 Karlsruhe
Germany
horst.geckeis@kit.edu

Dr Xiaolin Hou (Denmark)
Risø National Laboratory
Department of Radiation Research
NUK-202, DK-4000
Roskilde, Denmark
xiaolin.hou@risoe.dk

Prof. Jan John (Czech Republic)
Secretary of DNRC
Dept Nuc Chem, Czech Tech.Univ.
Prague
Brehova 7, 115 19 Praha 1, Czech
Republic
jan.john@jfifi.cvut.cz



Prof. Jukka Lehto (Finland)
Laboratory of Radiochemistry
P.O.Box 55
00014 University of Helsinki, Finland
jukka.lehto@helsinki.fi

Dra Catalina Gascó Leonarte (Spain)
CIEMAT (DIAF)(Ed3A)
Avda de la Complutense 22
Madrid 28040, Spain
cata@ciemat.es

Prof. Panagiotis Misaelides (Greece)
Dept. of Chemistry, Aristotle University,
PO Box 1547
GR-54006 Thessaloniki, Greece
misailid@chem.auth.gr

Prof. Jerzy Narbutt, (Poland)
Head of Dept of Radiochemistry
Institute of Nuclear Chemistry &
Technology
Dorodna 16, 03-195 Warszawa, Poland
j.narbutt@ichtj.waw.pl

Prof. Jan Petter Omtvedt (Norway)
Centre for Acc
PO Box 1033Blinde
NO315 Oslo, Norway
j.p.omtvedt@kjemi.uio.no

Prof. Ioannis Paschalidis (Cyprus)
Assistant Professor of Radiochemistry
Dept. of Chemistry, University of Cyprus
pspasch@ucy.ac.cy

Prof. Pavol Rajec (Slovakia)
Dept. of Nuclear Chemistry, Faculty of
Natural Sciences
Comenius University, Mlynska dolina
842 15 Bratislava, Slovakia
rajec@fns.uniba.sk

Dr Isabel Santos (Portugal)
Instituto Tecnológico de Nuclear,
Departamento de Química
Est. Nacional 10, 2686 Sacavém, Portugal
isantos@itn.mces.pt

Prof. Eric Simoni (France)
IPN, Paris XI University,
France
simoni@ipno.in2p3.fr

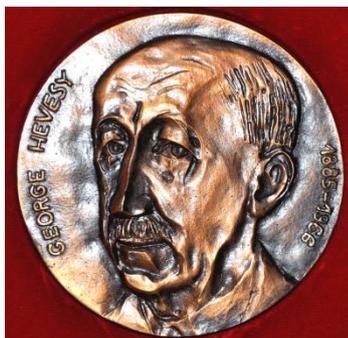
Prof Gunnar Skarnemark (Sweden)
Dept of Nuclear Chemistry, Chalmers
Univ of Technology
S-41296 Goteborg, Sweden
gunnar.skarnemark@chalmers.se

Prof. Turan Unak (Turkey)
Ege University, Faculty of Science
Dept of Chemistry, Div Nuclear Chem
Bornova, Izmir 35100, Turkey
turan.unak@ege.edu.tr

the heaviest elements, i.e. actinides and transactinides. These sessions were complemented with the session focused on the education of new professionals in nuclear- and radiochemistry. Two of the sessions were dedicated to the memory of our colleagues who have recently passed away, and who had participated in the RadChem conference organization for many years. The session "Radionuclides in the Environment and Radioecology" was dedicated to the memory of the late Prof. Petr Beneš and the session "Separation methods and speciation" to the memory of the late Prof. Věra Jedináková-Křížová.

The full conference programme is available at the conference web page (<http://www.radchem.cz>) together with freely accessible booklet of all accepted abstracts. Approximately 70 contributions that have been selected based on the results of a standard double-blind peer-review procedure are collected in this special issue of the Journal of Radioanalytical and Nuclear Chemistry.

Every day after the demanding conference scientific programme, the participants could have enjoyed a rich social and cultural programme. Monday sounded with the piano recital "Radiochemist plays Chopin" performed by Marek Bystran, a talented student of DNC CTU interpreting selected Chopin's compositions in an exceptional way. On Tuesday, all participants were offered a chance to relax during the evening programme "Wellness Night" where they could enjoy selected spa treatments in the conference host - Marienbad Kur & Spa Hotels - facilities. Wednesday afternoon was dedicated to a pleasant trip to the historical centre of town Cheb. The guided tours were followed by the conference dinner in Metternich Castle Hotel in the spa Lázně Kynžvart. The social programme was concluded with unusual fusion of fire show, theatre, acrobatics and expressional dance performed by the Amanitas Fire Theatre group. Traditionally, Thursday evening was devoted to the Singing Fountain performance at the spa colonnade which was preceded by another musical surprise – "Radiochemistry Jam Band Session", a performance of an amateur musician group composed of the conference participants presenting a programme rehearsed on-site during the conference.



Two prestigious scientific awards were presented during the conference – the international George Hevesy Medal Award, and the new Vladimir Majer Medal Award that was awarded for the first time here. Following sections are devoted to both the Medal Awards and their laureates.

George Hevesy Medal Award is a premier international award for excellence in radioanalytical and nuclear chemistry. It is awarded to an individual in recognition of excellence through outstanding, sustained career achievements in the fields of pure as well as applied



nuclear and radiochemistry, particularly applications to nuclear analytical chemistry. Established originally in 1968 by the Journal of Radioanalytical and Nuclear Chemistry (JRNC), the George Hevesy Medal has been awarded 19 times during 1968-86. In 2000, the Award was reactivated and it has been sponsored by JRNC and adjudicated by the International Committee on Activation Analysis/Modern Trends in Activation Analysis (ICAA/MTAA). Since then, 18 additional medals were awarded to renowned scientists. At RadChem 2014 conference prof. Heino Nitsche received the George Hevesy Medal Award in recognition of his international contributions to heavy element chemistry and actinide environmental chemistry.

George de Hevesy (*1. 8. 1885, †5. 7. 1966), a Hungarian radiochemist, Nobel prize laureate for chemistry in 1943, was one of the most important pioneers of nuclear- and radiochemistry and among other things he laid the foundations of radiotracer and activation analysis methods. He also participated in the discovery of the chemical element hafnium.

Prof. Heino Nitsche (*24. 7. 1949, †15. 7. 2014) spent almost 30 years in Lawrence Berkeley National Laboratory, Berkeley, California, USA (LBNL) which he joined in 1980 after earning his Ph.D. in nuclear chemistry at Freie Universität Berlin, Germany. In 1993, he returned to native, reunited Germany and took the lead at Forschungszentrum Dresden-Rossendorf. After 5 years he came back to Berkeley to become a director of newly founded Glenn T. Seaborg Centre at LBNL and a professor at the University of California, Department of Chemistry. Nitsche devoted the beginning of his scientific career to the chemical behaviour of actinides in the environment. Later on, he focused on the discovery of new transactinides; his team participated on the confirmation of 114 and 117 element existence. Recently, he joined projects focused on the application of nuclear forensic methods for the identification of nuclear material origin. Shortly after the end of the conference we received a message full of sadness and sorrow that prof. Nitsche unexpectedly passed away on July 15, 2014, only one week before his 65th birthday anniversary.



Vladimir Majer Medal Award is presented by the Nuclear Chemistry section of the Czech Chemical Society to scientists who significantly contributed to the development of nuclear chemistry and/or played a decisive role in the development of some its area. The first ever medal was awarded at RadChem 2014 in memoriam to the late Prof. Petr Beneš, former professor and head of the DNC CTU, for his lifelong contribution to the

nuclear chemistry development in Czechoslovakia and the Czech Republic.

Prof. Dr. Vladimír Majer (*19. 3. 1903, †5. 7. 1998) was a prominent Czech nuclear and physical chemist, one of the pioneers of the

Dr Nora Vajda (Hungary)
RadAnal. Ltd.
Konkoly Thege M. ut. 29-33
H 1121 Budapest, Hungary
vajdanor@gmail.com

Dr Israel Zilbermann (Israel)
Chemistry Department, Nuclear Research
Centre Negev,
POB 9001, Beer-Sheva 84190, Israel
kurzionz@bgumail.bgu.ac.il



Czech radiochemistry, co-founder of the FNSPE CTU. He authored the first Czech monograph "Radiochemistry" (1942) and most importantly the still unsurpassed textbook Fundamentals of Nuclear Chemistry (in Czech 1961, 2nd edition 1981; in German 1982).

Prof. Dr. Petr Beneš (*13. 7. 1938, †7. 6. 2013) was one of the first graduates of FNSPE CTU. His lifelong scientific career is connected with the Department of Nuclear Chemistry which he also led in the years of 1986-2003. Since 1970s his research was devoted to the development of methods for speciation studies and to the behaviour of toxic elements and radionuclides in surface waters and other components of the biogeosphere. Petr Beneš is ranked among the pioneers in this research area all over the world. Towards the end of his career he became interested in the applications of spectroscopic methods in speciation analyses and initiated the introduction of Time resolved laser fluorescence spectroscopy (TRLFS) at FNSPE.

Jiří Mizera, Irena Špendlíková, Jan John, Jan Kučera

CINCH-II project

In 2000 the OECD's Nuclear Energy Agency (OECD/NEA) report "Nuclear Education and Training: Cause for Concern?" demonstrated that many nations are training too few scientists to meet the needs of their current and future nuclear industries and authorities. Subsequent studies have confirmed the OECD/NEA findings. In Europe many countries lack sufficient staff and equipment to provide education across a broad field of nuclear topics. Of particular concern are skill deficits within nuclear chemistry at masters and doctorate levels: an area of strategic importance for the maintenance of current European nuclear operations and future energy options within the evolving EU economy. Such skills are also important for meeting the challenges presented by "beyond design basis" nuclear accidents caused by human failures, natural disasters, terrorist or sabotage activities where not only the technical handling of the situation is critical, but also making sure that information and recommendations to the public are correct and relevant.

Nuclear courses

In order to mitigate the effects of the declining number of qualified staff in nuclear chemistry, from 2010 to 2013 the CINCH-I project sought to coordinate education in Nuclear Chemistry. The CINCH-II project is a direct continuation of CINCH-I and aims to apply the critical mass required to implement the courses and meet the nuclear chemistry postgraduate education and training needs of the European Union.

The project is built around three pillars (Education, Vocational Education and Training (VET), and Distance Learning) supported by cross-



cutting activities on Vision, Sustainability and Nuclear Awareness that includes also dissemination and management activities.

The project will further develop and implement the plan for the European master's degree in nuclear chemistry (NRC EuroMaster) and complete a pan-European offer of modular training courses including addressing accreditation issues. It will develop a Training Passport in Nuclear Chemistry and prepare the ground for the European Credit system for Vocational Education and Training (ECVET) application in nuclear chemistry.

CINCH-II will implement modern e-learning tools developed in CINCH-I and further develop new tools for distance learning. It will lay the foundations of a Nuclear Chemistry Education and Training Platform as a future sustainable Euratom Fission Training Scheme (EFTS) in Nuclear Chemistry based on the already established CINCH consortium and its Associated Partners and develop a Sustainable System for Mobility to ensure an efficient mobility programme for trainers and trainees within the Nuclear Chemistry Network. Finally it will develop methods of raising awareness of the possible options for nuclear chemistry with potential students, academia and industry.

Experience counts

The project will make full use of the knowledge and experience gathered and tools developed and demonstrated in the CINCH-I project. It will gather consortium representatives from both educational suppliers (academia) and end-users (future employers) to enable the design of a syllabus that responds not only to the current but also to the future nuclear chemical education and training needs, such as pyrochemistry for future nuclear fuel cycles.

This will include assembling, comparing and evaluating approaches to, principles of, and experience with existing education and training across EU countries. Stress will be put on practical education that can provide, for example, a database of practical exercises in nuclear chemistry or simulations and RoboLab (a remote controlled laboratory experienced with video feedback) and hands-on components in all relevant courses developed. New common study materials in areas identified during CINCH-I will be developed and new or adapted courses for electronic educational platforms will be produced and made accessible for teachers and institutions either for free (through NukWik – see below) or based on individual agreements (CINCH e-learning platform).

Full use will be made of existing knowledge and expertise that is available via existing organizations, Euratom projects past and present, CINCH-II project partners and other relevant entities.

Training delivery

The foundations of a permanent Nuclear Chemistry Education and Training Platform as a future sustainable Euratom Fission Training Scheme



(EFTS) in Nuclear Chemistry will be laid. The EFTS will provide a platform where the courses developed within the training packages embedded in on-going or recent EURATOM “chemistry” projects, including ACTINET, ACSEPT, TALISMAN, SACSESS, SKIN, ASGARD and FAIRFUELS will remain available to all.

The implementation and development of modern e-learning tools will offer a unique distance learning opportunity to students as well as younger and experienced research workers from the nuclear chemical community. The e-learning tools to be developed include: NukWik - an open platform for sharing teaching material; e-learning modules on the existing CINCH e-learning platform; problem solving sets for “Computers in Education”; “RoboLab” remote controlled exercises; and simulation exercises.

In addition to the transfer of high-level competences, this will enable increased cohesion and international cooperation both within the nuclear chemical community and with other players in the nuclear energy field, help nuclear sector professionals to access vocational education and training and remain competitive within the labour market, and create a tool, which is accessible to all European parties (e-inclusive) helping to bridge universities, research centres and nuclear industries with SMEs and contributing to future cooperation between these parties.

Strategic importance

It is accepted that skills addressed by CINCH-II are of strategic importance for the maintenance of European nuclear operations and future EU energy options. They are also important for meeting the challenges presented by unpredicted nuclear events where handling the technical situation is of the same key importance as making sure that information and recommendations to the public are correct and relevant. And the demand for skills in nuclear chemistry will increase should Europe decide not to further develop its nuclear energy capacity due to the requirements for decommissioning existing nuclear installations.

The CINCH-II consortium will create a basis for public private partnerships that can grow over many years and maximise the transfer of higher level knowledge and technology to both younger students and experienced research workers. The opportunity to meet with colleagues from across Europe at joint modular courses delivered by the leading experts in the field can increase the attractiveness of research careers in nuclear chemistry across the EU.

Wider community

The project website will publicise the project’s key events including lectures, training, courses, open seminars, summer schools and international conferences organized in order to share the knowledge gathered during the project.



The project outcomes will be of generic value and can be exploited by other organizations. Therefore, the project partners will look to disseminate its ideas and results to the wider community beyond nuclear chemistry.

More details can be found and the results of the project can be followed at the project web page at <http://www.cinch-project.eu/>.

Coordinator

Jan John
Czech Technical University in Prague
Faculty of Nuclear Sciences and Physical Engineering
Department of Nuclear Chemistry
Brehova 7,
CZ-115 19 Prague 1
Czech Republic

Jan John

**Minutes of the Annual Meeting of the
DIVISION of NUCLEAR and RADIOCHEMISTRY
held on Thursday 15th May 2014 at 12:15 hrs
at Casino Conference Centre, Mariánské Lázně, Czech Republic**

Those present: Nicholas D.M. Evans (UK, Chair), Christian Ekberg (proxy Sweden), Xiaolin Hou (Denmark), Jan John (Czech Republic), Jukka Lehto (Finland), Jerzy Narbutt (Poland), Jon Petter Omtvedt (Norway), Ioannis Paschalidis (Cyprus), Pavol Rajec (Slovakia), Andreas Türler (proxy Switzerland), Nóra Vajda (Hungary).

Apologies were received from: Horst Geckeis (Germany), C. Gascó Leonarte (Spain), Turan Unak (Turkey).

Those not present: Mauro Bonardi (Italy), Alexander Chekmarev (Russia), Divna Djokić (Serbia), Zvonimir I. Kolar (The Netherlands), Panagiotis Misaelides (Greece), Isabel Santos (Portugal), Eric Simoni (France), Rayna Stefanova (Bulgaria), Israel Zilbermann (Israel).

Guest: Bert Wolterbeek (The Netherlands)

- 1) N. Evans welcomed the participants and introduced the new members, proxies, and the guest (representing The Netherlands).
- 2) N. Evans passed the apologies from those who sent their apologies to the group and could not be present for the meeting (for the list see above).
- 3) The Minutes of the previous DNRC meeting at Migration 2013 in Brighton (UK) on the 11th September 2013 were reviewed and approved.
- 4) The Annual Meeting agreed to the Agenda as circulated.



- 5) News from EuCheMS
- a) J. John presented the conclusions of the Divisions and Working Parties Chairs Meeting that took place in Budapest on the 24th October 2013. The most important conclusions were that
 - i) Eckart Ruehl (Freie Universität Berlin, Germany; Bunsen society; Division of Physical Chemistry) was elected as a candidate for the division heads representative in ExCom. There will be a call for the second representative to be selected and appointed during the year.
 - ii) New EuCheMS premises in Brussels include meeting rooms that can be used by the divisions.
 - iii) EuCheMS Forum can be used to store the internal documents of divisions.
 - iv) EuCheMS Web: appeal to keep it actual.
 - v) The division reports will be included as attachments to the EuCheMS Year Book (after some editing and formatting). This signifies the importance of the Reports.
 - vi) Helena Grenberg reported on the status of the 5th ECC Istanbul. Some complains raised on the general scientific level of ECC.
 - vii) "Our" Theme E was developed with almost no interaction with DNRC that was one its co-proposers! Helena states that Heinz Gäggeler should have been informed being in cc on all the Theme E organisational messages....
 - b) J. John presented the conclusions of the last General Assembly of EuCheMS that took place in Budapest on the 24-25th October 2013. The most important conclusions were that
 - i) Joint statement with European Physical Society on Managing the Transition to Open Access Publication was issued.
 - ii) EuCheMS policy development includes support seeking, activities directed towards introduction of a European Professional Card, transparency studies, sustainability of chemistry, setting up a MEP Award, Expo Milan 2015, conferences....
 - iii) Divisions are active mainly in conference organisation.
 - iv) EYCN - European Young Chemists' Network very active. Poster Awards. Set up a poster award in collaboration with EYCN at the DNRC divisional conferences?
 - v) David Cole-Hamilton (RSC; Uni St. Andrews, Scotland) elected new EuCheMS president-elect from 7 candidates (Boguslaw Buszewski, Poland; Michael Droescher, Germany; Pilar Goya, Spain; Ivanka Popovic, Serbia; Victor-Corneliu Radu, Romania; Livia Simon Sarkadi, Hungary; Saskia van der Vies, The Netherlands).
 - vi) Important changes to the EuCheMS Constitution – membership types, voting in the GA, definitions of competences – role of GA strengthened.



- vii) Estonia accepted as the first Baltic country, Electrochemistry division dissolved based on no reactions.
- viii) Awards Advisory Committee established (Luis Oro, chair).
- ix) Finances balanced.
- 6) EuCheMS Congresses
 - N. Evans reported on the status of the 5th and 6th EuCheMS Chemistry Congresses:
 - a) Istanbul 2014 – together with the Division of Chemistry in Life Sciences, DNRC participates in setting up the Theme E – Chemistry for and in Life Sciences. DNRC involvement was planned mainly in imaging. The theme convener is Nicholas Westwood but the DNRC was not invited to participate in the organisation...
 - b) Seville 2016 (11-15th September) – theme Energy Chemistry proposed with expected significant contribution of DNRC into the Nuclear Energy Chemistry part.
- 7) NRC series
 - a) Helsinki 2016 – Jukka Lehto informed that the preparations proceed smoothly. Conference poster was distributed; the conference web will be launched soon.
 - b) 2020 – Call for potential hosts to be launched next year so that the decision can be made in Helsinki.
- 8) EuroMaster update
 - Jan John briefly presented the participants with the CINCH-II project and its aims. Jukka Lehto presented the idea of EuroMaster in Nuclear and Radiochemistry and explained why the “ECTNA pathway” seems difficult – consortium of 3 as a maximum exist in Europe at this moment. A more relaxed system was proposed where some 10 universities could meet based on the “Minimum requirements”. On behalf of the CINCH participants, DNRC was asked to act as an “accrediting body”. Following this system, DNRC would be issuing a “supplement to diploma”. After a detailed discussion, the meeting agreed to the proposal; the formal decision was agreed to be taken in a year’s time.
- 9) Society representation
 - a) New representatives to DNRC were drafted from The Netherlands, Russia and Sweden. Nick Evans and Jukka Lehto will continue their efforts to draft new active representatives from France, Belgium (NE), and Bulgaria (JL).
 - b) Nick Evans will contact Estonian chemical society, as a new EuCheMS member, and ask for nomination of a representative to DNRC.
- 10) Date and place of the next Annual meeting
 - The next DNRC meeting was proposed to be organised during some meeting or seminar of the CINCH-II project, probably in June 2015.
- 11) AOB
 - No additional topics raised.

Recorded by: Jan John