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***RADIOCHEMISTRY IN EUROPE***  
***THE NEWSLETTER of the***  
***DIVISION of NUCLEAR and RADIOCHEMISTRY***  
**Issue 42–November 2008**

**EDITORIAL COMMENT**

Welcome to the forty-second newsletter for Radiochemists in Europe. The WebPages of the Division can be found at [www.euchems.org/Divisions/NRC](http://www.euchems.org/Divisions/NRC). From the home page the “Future Events”, updated each month or when fresh information is received, and Radiochemistry newsletters are readily available. Useful Links have also been established, including the Homepage of the Radiochemistry Group of RSC. If any other group would like their website to be linked, please send me the details.

The aims and objectives of the division as given in our Procedures and Practices are given below. The full version of Procedures and Practices is available on the webpage.

This is your newsletter for radiochemists in Europe. Articles, reports on meetings, laboratory profiles, courses, positions vacant, redundant equipment and any other item you feel may be of interest to other radiochemists are still urgently required. Also the early announcement of dates for meetings and conferences is important to avoid the possibility of organising two at the same time on similar topics within Europe. See the 10year Planning Calendar on the website. Details of any courses would also be of interest to extend the existing database.

May I remind readers to inform me of any change to their e-mail address?

Providing that information is available it is intended to compile this newsletter 4 times per year in March, June, September, and December/January. Please send information in good time for inclusion that is by the end of the month prior to publication. **Editor: Dr. Tony Ware (e-mail:tonyware@compuserve.com)**

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□ **DIVISION of NUCLEAR and RADIOCHEMISTRY.**

**Mission and Objectives**

The Division of Nuclear and Radiochemistry is a network of societies and their scientists working in nuclear and radiochemistry throughout Europe and aims to have close links to related institutions all over the world. A broad communicative basis is achieved by cooperation with relevant supranational bodies such as IUPAC and IAEA as well as with journals and newsletters. It endeavours to establish and maintain the highest quality standards in science and research. NRC accepts a role to harmonise education and training in all aspects of nuclear and radiochemistry and to offer a means of communication and collaboration between scientists working in the fields.

Objectives of the NRC are:

- To contribute to the advancement of nuclear and radiochemistry in Europe;
- To identify important areas in science, technology and other human activities relevant to nuclear and radiochemistry, and to stimulate actions in such fields;
- To address aspects of importance in or to nuclear and radiochemistry which need regulation, harmonisation, standardisation or codification, and to make recommendations as appropriate;

- To encourage co-operation between analytical chemists whether working in academia, industry or governance, in particular within the countries of the member societies of EuCheMS
- To foster close contacts and cooperation of NRC with the European Commission and other relevant institutions;
- To safeguard the interests of the nuclear and radiochemistry community, especially concerning recognition and legitimisation in matters of regulation and legislation as well as decision making in economic and in social areas;
- To assist and strengthen quality in teaching and training of nuclear and radiochemistry in education and in daily practice;
- To support the transfer and exchange of knowledge, equipment and personnel in the areas of NRC expertise both within Europe and in non-European countries;
- To hold a European Conference at least every other year;
- To assume a general promotion and coordination function for other conferences and courses in Europe related to NRC activities;
- To disseminate information to the wider scientific community and general public about nuclear and radiochemistry and its achievements.

### Priorities of the Division

Abide by the aims and objectives given in the Constitution and established as Practices and Procedures.

1. Continue editing the Newsletter as official information periodical of the Division with S. Jerome and A. Vertes assisting A. Ware in editing within the Newsletter Task Force.
2. Maintain the DNRC Web site – (All members are asked to send any links, they would like to have listed there, to A. Ware.)
3. Maintain the Diary of future events (10-years Calendar).
4. Play active role in co-ordination of Training & Education in Radiochemistry and Review of Courses.
5. Guarantee organisation of a European Conference on Nuclear and radiochemistry every other year by combining the NRC and Radchem series of meetings.

**If your country does not have a nominee to the Division, please press your Chemical Society to nominate a candidate.**

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### □ EUROPEAN ASSOCIATION for CHEMICAL and MOLECULAR SCIENCES EuCheMS European Young Chemist Award Winners

Dave Garner, Chair of the Jury, presented the Awards. The medal winners are

**Gold medal:** Fabio Arnesano, University of Bari, Italy, for his work ‘Copper-Triggered Aggregation of Ubiquitin’

**Silver medals:** Leonard J. Prins, University of Padova, Italy, for work on ‘Catalyst Discovery using Dynamic Chemistry’, and Ali Tavassoli, University of Southampton, UK, for work on ‘Inhibition of HIV Budding by a Genetically Selected Cyclic Peptide Targeting the TSG101-GAG Interaction’

**Gold medal at PhD level:** Guillermo Mínguez Espallargas, University of Sheffield, UK, for work on ‘Porous Material Behaviour in a Non-Porous Material: Gas Uptake of Small Molecules Involving Multiple Structural Changes’

**Silver medals at PhD level:** Gustavo Fernández, Universidad Complutense de Madrid, Spain, for work on ‘Self-Organization of Electroactive Materials: exTTF-Based Linear and Dendritic Supramolecular Architectures’ and Viktoria H. Gessner, Universität Würzburg, Germany, for work on ‘ $\alpha$ -Lithiated Methylamines as Powerful Building Blocks: From the Molecular Structure to Asymmetric Synthesis’

The 15 finalists gave presentations to the European Jury comprising Dave Garner, Royal Society of Chemistry, Angela Agostiano, Società Chimica Italiana, and Christian Remenyi, Gesellschaft Deutscher Chemiker. A total of 90 entries had been received from young scientists’ aged 22 - 35 from 30 different countries.

The European Young Chemist Award aims to recognise the excellent research being carried out by young scientists working in the chemical sciences. It is sponsored by the Società Chimica Italiana and was organised by the European Young Chemists Network Panel chaired by Bruno Pignataro, Italy.

### DIVISION of NUCLEAR and RADIOCHEMISTRY

**Minutes of the Annual Meeting held on Wednesday 27<sup>th</sup> August 2008 at 19 hrs at ELTE University, Budapest, Hungary**

**Those present: Mauro Bonardi (Italy), Heinz W. Gäggeler (Switzerland, Chair), Xiaolin Hou (Denmark), Jan John (Czech Republic), Zvonimir I. Kolar, (The Netherlands), Jukka Lehto (Finland), Panagiotis Misaelides**

**(Greece), Jerzy Narbutt (Poland), Ioannis Paschalidis (Cyprus), Pavol Rajec (Slovakia), Andreas Türlér (Germany), Árpád Vincze (Hungary), Anthony Ware (UK).**

**Apologies were received from: Divna Djokić (Serbia & Montenegro), Simon Jerome (UK), Per Hoff (Norway)**

**Those not present: Alexander Chekmarev (Russia), C. Gascó Leonarte (Spain), Isabel Santos (Portugal), Eric Simoni (France), Gunnar Skarnemark (Sweden), Rayna Stefanova (Bulgaria), Turan Unak (Turkey), Israel Zilbermann (Israel).**

**Guests: Nicholas D.M. Evans (UK), Heino Nitsche (USA)**

1. H. Gäggeler welcomed the participants and the guests.
2. The Annual Meeting agreed to the Agenda as circulated.
3. The minutes of the previous meeting (September 28<sup>th</sup> 2007) were reviewed and approved.
4. H. Gäggeler explained the change in chairman and secretary of the Division and thanked A. Ware for all his work for the Division.
5. EuCheMS Executive Board (EB) meeting H. Gäggeler informed those present about the main topics of the EB meeting.
  - next congress
  - new divisions
  - EuCheMS General Assembly (GA) will take place in Stavanger this year – J. John will replace H. Gäggeler for this meeting. A. Ware drew the attention to the fact that there should be a report presented by every Division during the GA.

#### 6. Official DNRC Conferences

Report by Árpád Vincze: NRC7 gathered ca 250 participants, no significant problems were encountered. The conference can be declared successful. The recommendation of the IAB for the future NRC conference is to continue with the tradition of no parallel sessions even though some 30 persons cancelled their participation in NRC7 because their contribution was not assigned as oral but poster.

Report by J. John: The date for the 16<sup>th</sup> Radiochemical Conference was fixed to be held in a week in April 2010. The conference will be organised “on behalf of the DNRC”. The DNRC decided to nominate ex-officio the DNRC chairman to become a member of the IAB. Further, the DNRC members agreed to support the local organisers and the IAB with advice on conference topics and invited lectures.

#### 7. NRC8

The only application came from Italy. The NRC7 IAB suggested accepting this proposal. The earlier considered option of going to Scandinavia or Finland was postponed to the NRC9. The DNRC approved this suggestion.

Timing was agreed to become a problem because the NRC conferences clash with EuCheMS congresses. The proposed dates are 9.-14.9.2012, the proposed place is one of the Northern Italian lakes (probably Univ. Milano conference facility at Lake Garda). M. Bonardi will be the chair of the Organising Committee.

#### 8. DNRC Session in Nürnberg (28.8.-2.9.2010)

GDCh Nuklearchemie (chair: A. Türlér) is prepared to organise a NRC session during the 3<sup>rd</sup> ECC in Nürnberg. Preliminarily, the following four topics were suggested: Nuclear Energy (P&T or Waste), Life Sciences (Radionuclide Therapy for Cancer Treatment), Chemistry of SHE, Environment (Climate Research). J. Narbutt suggested Stéphane Bourg (CEA, France, the current leader of the EU FP7 project ACSEPT) to be the speaker for P&T. DNRC recommends to organise a small full session similar to what was in Budapest (i.e. including some contributed talks and posters).

#### 9. Newsletter, website and 10-years conference calendar (A. Ware)

The RSC Radiochemistry organise a radiochemistry session at the forthcoming IUPAC meeting in U.K. N. Evans informed the DNRC about the plan of the session that has been strictly set by the organisers (2 lectures per 40 minutes, several shorter lectures and 2 minutes poster appetisers). N. Evans has been designated as the convener for this session. The suggested invited speakers are Horst Geckeis and one from the UK. N. Evans called for suggestions of additional speakers.

10-years conference calendar: still several clashes in radiochemistry conference series exist (e.g. NRC or ERA with EuCheMS congresses). All members are asked to send any information, they would like to have listed in the calendar, to A. Ware.

Website – it is working well now, A. Ware will continue to update it. The valid version of the “Procedures and Practices” will be placed to the web. All members are asked to send any links, they would like to have listed here, e.g. links to their national nuclear- and radiochemistry divisions and working groups, to A. Ware.  
Newsletter: A. Ware calls for the support, at least by the members of the respective Task Force (A. Vertés and S. Jerome). Distribution of the Newsletter (or the address for downloading) through the RADCH-L, RADS SAFE and NORM distribution lists was recommended. J. John will arrange with H. Gäggeler’s secretary to have the access to these lists.

10. Relations of DNRC EuCheMS with related organisations:

This topic was triggered by the INCS activities. The aim of the DNRC is, in the first phase, to strengthen the contacts between the important radiochemistry groups worldwide.

H. Nitsche reports on behalf of the ACS Nuclear chemistry division: The chair of the Division is responsible for organising two national meetings per year and, as a result of this, has virtually no time for any strategic planning even though any new chair has to pass a strategic planning course. The Division underwent an evaluation recently, its strength was suggested to be the breadth of the topics; its weaknesses include ageing, not efficient information of the members about the activities of Division. It was suggested to split the Division into the nuclear and radiochemistry parts. H. Nitsche informed that the next (the 4<sup>th</sup>) APSORC – Asia Pacific Symposium or Radiochemistry – will take place in Napa, California, on 30 November – 2 December, 2009.

Xiaolin Hou reported on the current state of INCS and the last INCS Congress. H. Nitsche drew the attention to the fact that the activities of the INCS may not be in the interest of the global nuclear- and radiochemistry community because they do rather separate than unify it. This view received a wide support among the DNRC members.

11. Approval of National Representatives

H. Gäggeler requested the DNRC members to check the validity of their nomination letters by their national chemical societies. In case of any problems or doubts, the members should contact H. Gäggeler to settle the matter.

12. Any other business

No additional topics were raised.

13. Date and venue for the next meeting:

The next meeting was agreed to be organised in coincidence with the IUPAC Congress in Glasgow, UK, on Tuesday, the 4<sup>th</sup> August 2009. The exact time and place will be announced later. A. Ware will organise the room in collaboration with N. Evans.

### **NRC series of Conferences**

At the annual meeting the series of Radiochemical Conferences held every four years in the Czech Republic were recently selected to form, together with the NRC series, the official series of general nuclear- and radiochemical conferences organised "on behalf of the EuCheMS DNRC".

The next Radiochemical Conference is to take place on 18-23 April 2010 in Mariánské Lázně.

The International Advisory Board of NRC7 and the Division on Radio- and Nuclear Chemistry agreed to invite Mauro Bonardi, Chair of the Interdivisional Group of Radiochemistry of the Italian Society of Chemistry (SCI) to host the NRC8 conference in Italy (region of the northern lakes) in 2012, with support of the SCI and other Italian institutions. These conferences will take place every two years. Other groups and societies are encouraged to organise events sponsored by the Division and EuCheMS and where possible to avoid conflicting with these dates.

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### **LABORATORY/BUSINESS PROFILES**

#### **Eichrom Environment becomes TrisKem International**

After running the European branch of Eichrom for about 10 years and being in charge of the technical and administrative development, Dr. Michaela Langer had the opportunity to buy the resin activity of Eichrom Europe and the right to produce the extraction chromatographic resins in Europe. Therefore she and her associate Céline Vignaud decided to create Eichrom Environment in January 2007.

Eichrom Environment became TrisKem International on June 1st 2008 with the aim to continue to provide the same high-level quality of products and technical support, but also to emphasise the research and development efforts which will be undertaken to respond to new and future needs in radiation protection and environmental monitoring.

The registered office of TrisKem International is still located in Bruz at the Campus of Ker Lann, in the south of Rennes, the capital of Brittany. All contact information, beside the name of the company and their contact e-mail address (contact@triskem.fr), stay the same.

The production laboratory is accommodated by the Ecole Nationale Supérieure de Chimie de Rennes (ENSCR), on the Campus of Beaulieu in Rennes and is operational since March 2007. The proximity to the universities and research laboratories facilitate the implementation of R&D projects.

Both sites are certified ISO 9001/2000 since July 2007, with the aim to improve our services and our quality system to respond to our customers' needs.

You can find additional technical and administrative information, as well as the newsletter "TrisKem Infos", on their new website: [www.triskem-international.com](http://www.triskem-international.com). Please also note that there is a forum available for everyone interested in the discussion of radiochemical subjects [http://triskem-international.com/forum\\_triskem.html](http://triskem-international.com/forum_triskem.html), everybody interested in participating is very welcome!

Attention - NEW EMAIL ADDRESS - Attention  
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Parc de Lormandiere - Bat. C, Rue Maryse Bastie, Campus de Ker Lann, 35170 Bruz - FRANCE  
Tel. +33.2.99.05.00.09, Fax. +33.2.99.05.07.27  
Web: <http://www.triskem-international.com> e-mail: [shappel@triskem.fr](mailto:shappel@triskem.fr)

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**□ CONFERENCE AND WORKSHOP REPORTS**

**7<sup>th</sup> International Conference on Nuclear and radiochemistry (NRC7)**

NRC7 took place from 24<sup>th</sup> – 29<sup>th</sup> August 2008 at the Eötvös University, Budapest, Hungary. Approximately 300 attendees attended the conference mainly from Europe but delegates from USA, Australasia, South America and Asia. In keeping with previous conferences in the series there were no parallel sessions as attendees were encouraged to listen and participate in all aspects of nuclear and radiochemistry. There were 65 oral presentations including 10 invited speakers and 150+ posters. The latter were displayed for the whole of the conference with plenty of time to view and discuss with the authors.

**Hevesy Medal Award**

The George Hevesy Medal is the premier international award of excellence to honour outstanding achievements in radioanalytical and nuclear chemistry. It was established in 1968 by the Editor in Chief of the Journal of Radioanalytical and Nuclear Chemistry. After a break it was re-established in 2000.

At the commencement of NRC& the award for 2008 was presented to Prof. Syed Qaim for his outstanding work over many years. He then gave his acceptance lecture entitled "Radiochemical determination of nuclear data for theory and applications." Prof. Qaim is currently at the Forschungszentrum Juelich/Universitat Köln, Germany

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**□ CONFERENCE AND WORKSHOP DETAILS**

**MARC VIII Education Topic**

At the upcoming MARC-VIII conference, Kona, HI, April 6 - 10, 2009 (please refer to <http://altmine.mie.uc.edu/nuclear/marc/viii.shtml> for conference details) the education topic will be organised in a Panel Discussion and contributed paper sessions with oral and poster presentations. Profs. Carolyn Anderson, Washington University, St. Louis, Peter Bode, Delft University of Technology, Greg Choppin, Florida State University, Tallahassee, Heino Nietsche, University of California, Berkley, David Robertson, University of Missouri, Columbia, and Craig Williamson, Clemson University, have agreed to participate in the panel presentations.

More exchange of information with the colleagues from Europe could certainly be fruitful on both sides of the Atlantic.

To enhance discussion of a roadmap for the future of our field a number of additional contributed papers from colleagues abroad would be very welcome at MARC-VIII. Please note that the deadline for abstracts is 15 Nov. 2008

**Materials Research Society Symposium on "Scientific Basis for Nuclear power", Dec 1 – 5 2008, Boston, USA**

In recent months, there have been many articles in the press about the renaissance of nuclear energy. Even many former opponents of nuclear energy are now considering the potential advantages of nuclear energy relative to fossil fuels. Electricity generated with nuclear power does not produce greenhouse gases, such as carbon dioxide that contribute to global warming. However, nuclear energy produces spent fuel or nuclear waste. Spent fuel is radioactive and requires thousands of years of isolation from plants, animals, and humans. Other radioactive waste-form types have been generated from the nuclear fuel cycle and from defence related activities.

Management of nuclear wastes remains a controversial topic. Waste management includes reprocessing of commercial nuclear fuel, waste form design and development, transportation, storage and disposal packaging, repository site selection, and performance assessment. A broad range of scientific and engineering disciplines is necessary to provide

safe and effective waste management solutions and to address complex issues. This symposium offers an important forum for discussion of materials-related issues associated with nuclear waste management programs.

The topics for which there is a call for papers include Radioactive waste pre-treatment, Transuranic chemistry, Radionuclide solubility, speciation, sorption, separation, and migration

Details from symposium organisers Paul B Rebak e-mail: [rebak@ge.com](mailto:rebak@ge.com) Neil C Hyatt e-mail:

[n.c.hyatt@sheffield.ac.uk](mailto:n.c.hyatt@sheffield.ac.uk) and David A Pickett e-mail: [dpickett@cnwra.swri.edu](mailto:dpickett@cnwra.swri.edu)

The first Announcement of the 33<sup>rd</sup> International Symposium "Scientific Basis for Nuclear Waste Management" has now been made. The Conference will be held in Saint Petersburg, Russia (Sunday-Friday, May 24-29, 2009).

Abstracts submission will start January 15, 2009.

Detailed information will be provided at Web-site: [www.mrs09.com](http://www.mrs09.com)

Please, do not hesitate to contact the organisers if you have any questions at E-mail: [info@mrs09.com](mailto:info@mrs09.com)

Albert Aloy and Boris Burakov, The Conference Chairs and Ms. Yana Domracheva, Secretary

### **NUCAR 2009, Nuclear and Radiochemistry Symposium**

The NUCAR Conference series is organised by the Board of Research in Nuclear Sciences of the Department of Atomic Energy of India. It covers a broad range of frontier research in radiochemistry and is hosted by the SVKM'S college, affiliated to Mumbai University. The forthcoming NUCAR2009 will be held from January 7 – 10, 2009. For further information see: [www.barc.gov.in/symposium/nucar2009](http://www.barc.gov.in/symposium/nucar2009)

### **ACTINIDES 2009**

The conference series features current research in the physics and chemistry the actinides and the transactinide elements. Of particular importance will be a focus on the key roles basic actinide chemistry and physics research play in advancing the worldwide renaissance of nuclear energy. It will be held from 12 – 17 July 2009 in San Francisco, California. Details can be found on: [www.lbl.gov/actinides2009](http://www.lbl.gov/actinides2009)

### **International Commission on Radionuclide Metrology**

The ICRM General Meeting accredited the Slovak Institute of Metrology (SMU) to organise the next ICRM conference in 2009. It will be from 7 – 11 September in Bratislava, Slovakia. Information is placed on the [www.icrm2009.sk](http://www.icrm2009.sk) web page where you also find pre-registration forms. This page will be continually updated.

Please, take a note of the date and make it as widely known as possible.

### **MIGRATION '09**

The 12<sup>th</sup> Int. Conference on the chemistry and migration behaviour of actinides and fission products in the geosphere will be held from 20-25 Sep. 2009 in the Three Rivers Convention Center, Kennewick, Washington, USA. This conference series focuses on recent developments in the fundamental chemistry of actinides, fission and activation products in natural aquifer systems, their interactions and migration in the geosphere, and the processes involved in modelling their geochemical behaviour ([www.emsl.pnl.gov/root/news/migration09](http://www.emsl.pnl.gov/root/news/migration09))

### **7<sup>th</sup> Workshop on the Chemistry of the heaviest elements**

The workshop focuses on the recent developments in the fundamental chemistry of the transactinides in the liquid phase and in the gas phase, and the respective theoretical modelling. It will be organised by the Institut für Kernchemie of the Johannes Gutenberg University of Mainz from 11 – 13 October, 2009. For further details see:

[www.kernchemie.uni-mainz.de/519.php](http://www.kernchemie.uni-mainz.de/519.php)

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## **☐ NEWS FROM THE INTERNET**

### **Economics of Nuclear Power Report**

The economics of nuclear power is a controversial subject, since multi-billion dollar investments ride on the choice of an energy source. Nuclear power plants typically have high capital costs for building the plant, but low fuel costs. Therefore, comparison with other power generation methods is strongly dependent on assumptions about construction timescales and capital financing for nuclear plants. Cost estimates also need to take into account plant decommissioning and nuclear waste storage costs.

On the other hand measures to mitigate global warming, such as a carbon tax or carbon emissions trading, may favour the economics of nuclear power. Analysis of the economics of nuclear power must take into account who bears the risks from future uncertainties. To date all operating nuclear power plants were developed by state-owned or regulated utility monopolies where many of the risks associated with construction costs, operating performance, fuel price, and other factors were borne by consumers rather than suppliers.

Many countries have now liberalised the electricity market where these risks, and the risk of cheaper competitors, are borne by merchant plant suppliers rather than consumers, which can lead to a significantly different evaluation of the economics of new nuclear power plants.

The research report, Exploring the Economics of Nuclear Power, studies the economics of nuclear power - looking at construction costs to fuel costs to capital costs. The analysis is broken up into an analysis of fixed versus variable costs.

O&M costs, decommissioning costs, etc., are all focused on in this report. The report also focuses on how much it costs to develop a new nuclear power plant, along with a country-wise analysis, which looks at the new orders for nuclear power plants.

Building costs for generation III and IV plants are also described in details in this report. The report concludes with an economical comparison between nuclear power and other renewable such as wind power, biomass, geothermal energy, and more. Major industry players are also analysed in the report.

For more information please click on:

[http://www.researchandmarkets.com/product/c7eae1/exploring\\_the\\_economics\\_of\\_nuclear\\_power](http://www.researchandmarkets.com/product/c7eae1/exploring_the_economics_of_nuclear_power)

A further report presents a comprehensive analysis of various sectors of the nuclear energy industry. The report analyses uranium industry development, nuclear reactor technology development, nuclear energy development, investment prospects in nuclear sector, economics of nuclear energy and the major players in the nuclear energy industry. The report analyses nuclear power sector, government policies and the regulatory structure in major nuclear energy producing countries.

For more information please click on:

[http://www.researchandmarkets.com/product/f6bd1e/reemergence\\_of\\_the\\_nuclear\\_industry\\_in\\_the\\_gl](http://www.researchandmarkets.com/product/f6bd1e/reemergence_of_the_nuclear_industry_in_the_gl)

A companion report gives case studies, information on funding sources, and a heads-up on other inherent challenges you may not yet have envisioned for development of nuclear power.

For more information please click on:

[http://www.researchandmarkets.com/product/b55a93/the\\_rebirth\\_of\\_nuclear\\_power\\_in\\_the\\_united\\_st](http://www.researchandmarkets.com/product/b55a93/the_rebirth_of_nuclear_power_in_the_united_st)

The Global nuclear power report.

The position of nuclear energy in the world is fairly stable. In Asia and Russia intensive investment in new capacity is taking place, while in the United States, the focus is on life extension of existing nuclear power plants. In Europe, new nuclear power plants are being built in Finland, France and Romania.

The report looks at the basics of the nuclear industry, that is, how a plant works, analysing and understanding the fuel cycle, the various components which are involved in the working of a nuclear power plant, and much more.

Economics, issues and barriers, regulatory incentives, tax incentives and other such factors are also explored in-depth in this report.

[http://www.researchandmarkets.com/product/55c017/global\\_nuclear\\_power\\_industry](http://www.researchandmarkets.com/product/55c017/global_nuclear_power_industry)

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□ **JOB OPPORTUNITIES**

**PostDoc position for 1 year at SUBATECH, Nantes, France**

Subject: Study of the behavior of C-14 and Cl-36 during the interaction of irradiated graphite with water.

In France, the sub-surface disposal of irradiated reactor graphite is foreseen. Irradiated graphite contains variable quantities of C-14 and Cl-36. During contact of disposed graphite with groundwater, some of the C-14 may become released either in organic or in inorganic form, either water soluble or gaseous. These different forms differ largely in their migration behavior in the environment; hence, knowledge on the chemical speciation of C-14 released from graphite is of direct safety concern. SUBATECH is engaged both in the context of national and European projects related to graphite disposal and more general a large suite of questions related to nuclear waste disposal.

The rate of release of C-14 from graphite is rather small and accelerated testing methods shall be employed. The proposed work consists in studying the interaction of irradiated graphite with water by electrochemical polarization of electrodes made from irradiated graphite and following the release of either C-14 and/or Cl-36. In this way also the effect of redox potential on radionuclide release from graphite can be studied. Distinction between organic and inorganic carbon release shall be made. Spatial distribution of the radionuclides in the graphite shall be assessed by developing suitable sample slicing and analytical procedures.

Techniques available in the laboratory:

Alpha and gamma spectroscopy, liquid scintillation counting for beta radiation, ICP-MS, ion chromatography, total and organic carbon analyzer, UV-Vis and IR spectroscopy, X-ray diffraction, potentiostats and galvanostats, colloid characterization by AFFFF, laser induced breakdown detection (LIBD) and MALS, equipment for potentiometric titration, for sample preparation (for solids: cutting, polishing, grinding, sieving..., for liquids ultracentrifugation and ultrafiltration) various types of high performance inert glove boxes and inter-laboratory collaborations to laboratories with AMS analyses exists.

Required profile:

A PhD in radiochemistry, analytical chemistry or materials science is a necessary condition.

Language skills: laboratory language is French, but English speaking people are also easily integrated. Reports can be written in English or French.

□ AND FINALLY

Please send information for inclusion in future issues to your Liaison Person or myself Dr Tony Ware, Avoncastle, South Lane, Sutton Valence, Maidstone, Kent ME17 3AZ, UK. Tel: +44 (0)1622 842627, e-mail: [tonyware@compuserve.com](mailto:tonyware@compuserve.com)

**IMPORTANT PLEASE** send me your e-mail address so that I can inform you when websites have been updated and any other news of immediate interest.

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