

Secretariat: Radiochemistry Group
Analytical Division
The Royal Society of Chemistry
Burlington House
Piccadilly
London W1V 0BN
United Kingdom.



RADIOCHEMISTRY IN EUROPE NEWSLETTER

Issue 25 – May 2003

EDITORIAL COMMENT

Welcome to the twenty-fourth Newsletter for Radiochemists in Europe under the sponsorship of the Federation of European Chemical Societies (FECS).

This newsletter is now firmly established on web page (<http://www.rsc.org/pdf/andiv/europenews.pdf>). The newsletter is also available through the website of The WP on Nuclear and Radiochemistry of FECS, namely <http://www.chemsoc.org/networks/enc/fecs/fecsradioc-hemistry.htm>. This website has other useful connections to "Future Events" called nuclear and radiochemical activities in Europe, and the Homepage of the Radiochemistry Group of RSC. If any other group would like their website to be linked, please send me the details. With regard to the Future Events I am trying to include conferences in other disciplines which have or could have a section involving nuclear and radiochemistry. This is in keeping with the FECS WP's aim to involve scientists from a wide range of disciplines and topic areas.

The FECS WP on Nuclear and Radiochemistry, which is discussing training needs in Europe, has maintained contact with other groups who have lodged

Expressions of Interest within the FP6 programme of the European Commission. An update on these will be found later in the newsletter. Whilst none cover the exact area of interest of the WP attempts will be made to share any data collected via the various surveys and to seek reports from the various activities for inclusion in future newsletters.

Reports are included on the progress made following the IAEA meeting and report "Assessment of the teaching and applications in radiochemistry."

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.

Providing that information is available I intend 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)**

----- x -----

•EUROPEAN RADIOCHEMISTS ASSOCIATION.

Aims and Objectives

The objective of the association is to extend and improve communications between radiochemists in Europe through a newsletter. This will be achieved through aims, which include

1. Establishing a liaison person within each country (or group).
2. Exchanging with each of the other liaison persons details of the activities of their own group during the current and subsequent years,
3. Setting up a diary of relevant International Events to avoid duplication of dates and hence improve attendance
4. Exchanging details of specialist equipment, facilities and methodology.

**•FEDERATION OF EUROPEAN CHEMICAL SOCIETIES
EUROPEAN COMMISSION'S 6th FRAMEWORK PROGRAMME FOR RESEARCH**

As indicated in the last newsletter information from the European Commission had indicated that the FP6 Budget has a specific item for Euratom Priorities and that nuclear and radiochemistry is regarded as part of this budget. There were two calls for projects in the Euratom Research and Training Programme on Nuclear Energy (2002-2006). The first call is for "Education and training in nuclear engineering and safety" with the aim to achieve the sustainable integration of education and training in nuclear engineering and safety in Europe. The FECS WP on Nuclear and Radiochemistry has maintained contact with this proposal but is not part of it.

The second is "Education and training needs for radiation protection and radioactive waste management" with the objective to determine the needs for co-ordinated education and training activities on a European scale and how these could be met. Dr Ware attended a meeting for partners in such a proposal organised by NIREX, UK and NAGRA, Switzerland in London. A proposal for a Coordinated Action has been lodged which plans over a two-year period to review the necessity, requirement and syllabus for education and training in radiation protection and radioactive waste management. In principal the work will involve national correspondents initially to determine need followed by sector correspondents to determine course requirements in specific technical areas. Individual members of the WP may have been involved as national correspondents and Dr Ware for the WP is suggested to act in the sector for nuclear and radiochemistry. This is of course only a proposal and the European Commission will indicate in September/October which projects have been accepted.

This involvement in FP6 proposals falls well short of the WP aim for the wider education and training of radiochemists, which the WP envisaged in its proposal. The WP will need to discuss at its annual meeting how to proceed with its wider review.

The WP is still interested in establishing a network or at least a database of universities and laboratories that offer training packages in nuclear and radiochemistry as it is still possible for the WP and individuals to seek funds from the Framework Programme 6 (FP6) through its Human Resources and Mobility Programme. "Marie Curie Conference and Training Courses will allow less experienced researchers to benefit from learning from and networking with experienced researchers. Summer schools, training events, laboratory courses covering one or several specific themes over a period of years will be supported. A series of events spanning 4-5 years and organised through professional agencies would appear to be especially favoured. Participants will be funded to attend if they are within 4-10 years of the date when they obtained their first degree."

The WP has not had an opportunity to meet to discuss progress so the views expressed above are not formally endorsed.

(e-mail:tonyware@compuserve.com)

----- ✕ -----

•LABORATORY PROFILE

No profile has been offered for inclusion. If you would like your laboratory or research group to be profiled, please contact editor with draft script.

----- ✕ -----

•IAEA

**IAEA Report into the "Assessment of the teaching and applications in radiochemistry."
Training modules for Radiochemists initiated by the IAEA-Vienna**

A Consultants' Meeting was held at the King Kamehameha Hotel, Kailua-Kona, Hawaii prior to the MARC VI Conference in April this year with participation of experts from USA, Canada, Argentina, Japan, Germany and Belgium. It addressed the urgent need for additional educational material for students and teachers of radiochemistry and resulted in a concise plan to prepare a series of CD ROMs with basic and advanced courses in theoretical and practical radiochemistry. Taped lectures as well as animated textbook advanced chapters will be combined to issue an attractive training tool for a slowly fading academic discipline. This activity is a follow up of the previously organized CM on "Assessment of the teaching and applications in radiochemistry" held in Antalya, Turkey, June 2002. Reports of both meetings are available on request from M.Rossbach@IAEA.ORG.

----- ✕ -----

• CONFERENCE REPORTS

MARC VI Conference, Kailua-Kona, Hawaii 7-11 April 2003

The 6th International Conference on Methods and Applications of Radioanalytical Chemistry (MARC VI) was organised by the American Nuclear Society, the American Chemical Society, the Canadian Chemical Society and several US

institutes and universities. The Conference was organised from 07-11 April 2003 in Kailua-Kona, Hawaii in co-operation with the IAEA and comprised of 18 oral sessions (3 days in parallel sessions) and two poster sessions of a large variety of different applications (QA/QC and Method validation, Activation Methods and Applications, Software for X and gamma Spectrometry, Environmental Radioactivity, Ultra-sensitive MS and Advanced Methods, Instrumentation for X and gamma Spectrometry, Radiotracers and Radiochemical Methods, Actinides in Biological and Environmental Systems, Fuel Cycle and Nuclear Waste, National Security and Non-Proliferation Studies, Neutron and Ion Beams in Biological Research, and Radiopharmaceutical Studies and Nuclear Medicine).

The Conference started Monday morning with the 2003 Hevesy Medal Award presented to Prof. J.J.M. de Goeij, Interfaculty Reactor Institute, Delft University of Technology, The Netherlands. [Ed. Comment. For Press Release see section News from the Internet.] It was followed by a panel discussion on "Manpower Requirements and Educational Needs in Nuclear Sciences" organised by R. Zeisler (chair), Sue Clark, and Susan Parry. This special session highlighted the problems and challenges facing many countries with active nuclear programmes. The panel discussion received substantial interest and resulted in a "Statement" signed by more than 130 participants to be used for further distribution to public and political institutions, including the IAEA through the national representatives, to enhance awareness of the criticality of the situation with regard to radiochemical manpower preservation for future development (see the attached statement).

The venue, the very efficient organisation of the meeting and the attached social programme assured a very fruitful and enjoyable Conference as was expected from previous experience of this most important event for nuclear and radioanalytical Chemists from the international community.

Participants endorsed the following Statement on the 'Current Position of Nuclear Chemistry and Radiochemistry'

STATEMENT ON THE CURRENT POSITION OF NUCLEAR CHEMISTRY AND RADIOCHEMISTRY

Resolution of the Panel on Manpower Requirements and Education in Nuclear Science,

MARC VI Conference, Kona, Hawaii, April 07-11, 2003

Nuclear Chemistry and Radiochemistry have contributed greatly to the well-being and prosperity of mankind as demonstrated by its applications to human health, *e.g. diagnostic procedures and therapy of various diseases, including cancer and fighting infectious diseases*, to the protection of the environment, *e.g. in radioecological studies, monitoring of pollutants, and understanding local and global climatic changes*, to international security, *e.g. in reduction and control of the spread of nuclear weapons*. These disciplines are also important in the production, handling and consumption of *foods free of bacteria*, assuring compatibility of analytical measurements, the protection of historical and cultural heritage, and as tools in scientific and technological research. Moreover, they contributed to a better understanding of the universe we live in.

Regretfully, Nuclear and Radiochemistry are now becoming neglected disciplines. With many factors contributing to this decline, such as the perceived maturity of the field, the public misconceptions, as well as shortsighted economics, students are choosing other topics. Funds to support scientific institutions working in these disciplines are being drastically cut. It is documented in governmental and industrial manpower studies conducted around the globe that within a few years the need for experts will possibly double. If the current trend is not reversed within one generation or less, the knowledge and expertise accumulated so far in an entire scientific sector through immense effort and dedication will be lost. Considering the time lines for education, its restoration in the future will be a very expensive endeavour and will be possibly too late to meet the demands of international security and global human and ecological health.

We put this notice out to politicians, citizens and media to use their influence to reverse this trend to the benefit of present and future generations. The undersigned participants of MARC VI specifically emphasise that:

Nuclear and Radiochemistry must be again considered as an academic discipline per se and NOT as an appendix to nuclear technology, *e.g. nuclear power generation*. The subject is essential to a large number of scientific fields and industry sectors, but has only a limited overlap with nuclear power technology.

It must be considered that the expertise in Nuclear and Radiochemistry can by no means be maintained by restricted training programs of the nuclear industry. The field is a vital academic discipline that is under permanent development through research and, hence, deserves financial support from public and industrial sectors.

IAEA, with its commitment to the peaceful use of nuclear science and technology, should, with its Member States, more substantially contribute to the international promotion of all basic and applied aspects of Nuclear and Radiochemistry.

(Editorial comment. Please circulate and use this statement wherever you feel that it can make an impact.)

----- x -----

· CONFERENCE AND WORKSHOP DETAILS

SIS'3 Slovakia, Sept. 6-11 2003

The 10th International Conference on Separation of Ionic Solutes will take place at Podbanske, High Tatras, Slovakia from September 6-11, 2003. The following topics will be covered: separation and speciation of non-volatile, ionic and ionogenous species, isolation and purification of labeled compounds, radiopharmaceuticals and proteins, theory of

solutions and unit operations, ion exchange, solvent extraction, reactor and accelerator target chemistry, downstream processes, equipment for HPLC, electrophoresis, solvent and solid extraction, membrane and magnetic separations, hyphenated techniques, automation, optimization, quality assurance and quality control of separation techniques, industrial processes and waste treatment.

Details on www.fns.uniba.sk/~kjd/sis03.htm OR contact Prof. Fredor Macasek, macasek@fns.uniba.sk or Dr. Jana Kufcakova, kufcakova@fns.uniba.sk

LSC Workshop, Loughborough, UK

Loughborough University is running another of its successful Liquid Scintillation Counting Workshops from 22-26 September 2003 i.e. this year.

For details contact Prof. Peter Warwick at P.Warwick@lboro.ac.uk

----- ✕ -----

•RADIOCHEMISTRY GROUP OF RSC

The Radiochemical Methods Group of the Royal Society of Chemistry has for many years supported me as the Editor of this newsletter and as Secretary to the FECS WP on Nuclear and Radiochemistry. The Group, following a review of its members, decided with RSC approval to change its name to Radiochemistry Group. The current Committee membership has representatives from the nuclear industry, education and measurement of radionuclides in the environment. It is the intention to attract members and committee members from a variety of areas including Medical/Pharmaceutical, Environmental, Chemistry, isotope production, Nuclear Fuel Cycle, Analytical Techniques, Waste Management, Regulatory, Safeguards and indeed any other areas in which radionuclides are used.

This comes into line with the recent IAEA Review and the general aims of the FECS WP on Nuclear and Radiochemistry. The proposed new Mission Statement is therefore very brief, "To promote, educate, practice and collaborate in the chemistry of radioisotopes."

----- ✕ -----

•NEWS FROM THE INTERNET

GEORGE HEVESY Medal Award 2003: PRESS RELEASE

Prof. Dr. Jeroen J.M. de Goeij is the recipient of the Hevesy Medal Award 2003. The medal has been awarded to him for his innovative and original research in a wide area of nuclear analytical chemistry. He is an Emeritus Professor at the Interfaculty Reactor Institute / Technical University (IRI/TU) Delft and professor at the Technical University Eindhoven. The award has been presented to him at the Sixth International Conference on Methods and Applications of Radioanalytical Chemistry (MARC-VI) held in Kailua-Kona, Hawai'i, USA during 2003 April 07-11. Prof. Jeroen J.M. de Goeij is the first Dutch scientist to receive the Hevesy Medal Award among the 24 awardees since its establishment in 1968.

The George Hevesy Medal Award is the premier international award of 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 Award has been given 19 times during 1968-86. This Award has been reactivated in 2000 by the Professor Tibor Braun, Editor-in-Chief of JRNC. It is sponsored by JRNC and adjudicated by the International Committee on Activation Analysis/Modern Trends in Activation Analysis (ICAA/MTAA). The Award has no monetary value. The George Hevesy Medal Award comprises an engraved bronze medal and an ornamental scroll.

The members of the Hevesy Medal Selection Panel (HMSP) 2003 were: Prof. Tibor BRAUN (Hungary) (*Editor-in-Chief JRNC*), Dr. Anthony R. BYRNE (Slovenia), Prof. Zhifang CHAI (China), Prof. Gregory R. CHOPPIN (USA), Prof. Roy H. FILBY (USA), Prof. Robert E. JERVIS (Canada), and Dr. Robert PARR (Austria). Prof. Amares CHATT (Canada) was the *Non-voting Chair of HMSP 2003*.

The names (year) of the former awardees are: W. Wayne MEINKE (1968), Albert A. SMALES (1969), Ivan Pavlovich ALIMARIN (1970), Philippe ALBERT and Julien HOSTE (1972), Tibor BRAUN and Juraj TÖLGYESSY (1975), Francesco GIRARDI (1976), Saadia AMIEL and Richard E. WAINERDI (1977), Robert E. JERVIS (1978), Vincent P. GUINN (1979), William S. LYON and Max PEISACH (1981), Edward V. SAYRE and Garman HARBOTTLE (1983), Georges AMSEL (1984), Nobuo SUZUKI (1985), Emile A. SCHWEIKERT (1986), Frans DE CORTE (2000), Amares CHATT and Eiliv STEINNES (2001), and Enrico SABBIONI (2002).

(Professor Dr. Amares CHATT, Non-Voting Chair, Hevesy Medal Selection Panel 2003, President, ICAA/MTAA. Killam Professor of Chemistry, Director of SLOWPOKE-2 Facility, Trace Analysis Research Centre, Department of Chemistry, Dalhousie University, Halifax, Nova Scotia, B3H 4J3, Canada.

Phone/Answering Machine/Fax: ++1-902-494-2474, E-mail: a.chatt@dal.ca

Harwell Scientifics, Oxfordshire, UK

We have some vacancies at Harwell Scientifics, based in Oxfordshire (UK) for experienced radiochemists. We are a contract analytical laboratory analysing a wide variety of sample types for a range of radionuclides. The work is challenging and varied and requires a can-do attitude and a flexible, problem-solving approach. If you are interested or would like further details please contact samantha.sethi@harwell.scientifics.com

Post doctoral proposal

Leaching behavior of High Temperature Reactor (HTR) UO₂-ThO₂ mixed oxides fuel particles

High Temperature Reactors (HTR) are considered as promising medium-term alternative to present light water reactors. One of the expected benefits is related to the waste management. Safety advantages of spent HTR fuel are based on the knowledge of the long term behaviour of the fuel elements in conditions relevant to the final deep disposal sites. HTR fuel elements are composed of UO₂-ThO₂ mixed oxides SiC coated particles embedded in a graphite matrix. After failure of the coatings by chemical or mechanical interactions, fuel dissolution becomes the dominant factor for the release of the radionuclides.

Objectives of the study

The aim of the study is the assessment of the rate of dissolution of unirradiated and irradiated fuel kernels under experimental conditions relevant to deep disposal conditions. The experimental data will be modelled with a geochemical model in order to obtain a source term for the long-term safety calculations.

Experimental work description

The experimental work is based on leaching tests using batch static and dynamic techniques and performed under reducing conditions. Mixed UO₂-ThO₂ oxides with different U/(U+Th) mass ratio are leached with synthetic groundwaters of different chemical compositions (clay, granite). At various leaching times, uranium and thorium concentrations are measured at various leaching times by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). The dissolution rate of the material, described by a normalized leaching amount (N_L) is then determined. Solid phases can also be analysed by Scanning Electronic Microscopy (SEM). These experiments have to be performed first on unirradiated kernels and then the experimental device will to be transferred into a glove box dedicated to the study of irradiated kernels.

Education: Doctorate in radiochemistry, chemistry or physical chemistry is required

Contact: Dr C. Landesman, Laboratoire SUBATECH, Ecole des Mines de Nantes - Unité Mixte de Recherche 6457

4, rue A. Kastler –La Chantrerie – BP 20722, 44307 Nantes Cedex 3

catherine.landesman@subatech.in2p3.fr

IAEA Reference Materials Database (Update)

The IAEA's database of natural-matrix analytical reference materials may already be well known to readers of NAMLS NEWS or this newsletter. This database is a very useful source of information on certified (and other) reference materials for trace elements, and various other measurands, in a wide variety of biological, environmental and other materials from all known suppliers (not only the IAEA).

An updated version of the database has been online since January 2003. Around 580 new materials have been added, and several materials that are no longer available have been deleted. The present version of the database contains over 31,000 values (mass fraction or concentration) for 850 different measurands and 2027 reference materials prepared by 55 producers in 22 countries. The following types of measurand are included:

Elements (mainly trace elements, but also including some minor and major elements), Inorganic compounds, Ionic and extractable compounds, Organic microcontaminants and organometallic compounds, Radionuclides and Stable isotopes.

Website: <http://www-naweb.iaea.org/nahu/external/e4/nmrm/>

IAEA-TECDOC-1339, January 2003 "Clean laboratories and clean rooms for analysis of radionuclides and trace Elements." This document can be downloaded as a PDF file (use right click; select "Save Target As..."):

http://www-pub.iaea.org/MTCD/publications/PDF/te_1339_web.pdf

A limited number of hard copies of the report are also available cost-free on request from Matthias Rossbach, IAEA m.rossbach@iaea.org

----- x -----

· 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

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.

LIST OF CURRENT LIAISON PERSONS

Dr Max Bichler (Austria)

Technische Universität
Wien, Atominst.
Abteilung Radiochemie Stadionallee 2,
A-1020 Wien, Austria
Tel.: 43 1 58801 14192
e-mail: bichler@ati.ac.at

Dr Ales Fajgelj (IAEA, Austria)

IAEA, Agency's Lab Seibersdorf
A-2444 Seibersdorf, Austria
Tel: 43 1 2600 28233
e-mail: a.fajgelj@iaea.org

Prof Dr P Benes (Czech Republic)

Czech Technical University
Nuclear Sciences & Physical
Engineering
115 19 PRAHA 1
Brehova 7, Czech Republic
Tel: (2) 231 76 26
e-mail: benes@br.fjfi.cvut.cz

Dr H Dahlggaard (Denmark)

Risoe National Laboratory,
P O Box 49, NUK-204
DK-4000 Roskilde, Denmark
Tel. 45-46775314
e-mail: henning.dahlggaard@risoe.dk

Dr J Lehto (Finland)

Laboratory of Radiochemistry
P.O.Box 55
00014 University of Helsinki
Finland
Tel: +358-9-19140137
Fax: +358-9-19140121
email: jukka.lehto@helsinki.fi

Dr D Trubert (France)

Institut de Physique Nucleaire
Division de Radiochimie
BP 1
F-91406 Orsay Cedex

Prof. Dr Fedor Macasek (Slovakia)

Department of Nuclear Chemistry
Comenius University
Mlynska dolina
SK-842 15 Bratislava, Slovakia
Tel. +421 7 60296308,
Fax: +421 7 65424685
e-mail: macasek@fns.uniba.sk

Dr Milka Benedik (Slovenia)

Laboratory for Radiochemistry
J Stefan Institute
1000 Ljubljana
Slovenia
Tel: + 386 1 5885 450
e-mail: ljudmila.benedik@ijs.si

Dra C Gasco (Spain)

CIEMAT (DIAF)(Ed3A)
Avda de la Complutense 22

France

Tel. (33) 16 1 69 41 73 45
e-mail: trubert@ipncls.in2p3.fr

Prof. Dr. R. Michel (Germany)

Zentrum für Strahlenschutz und
Radioökologie
Am Kleinen Felde 30
D-30167 Hannover
Germany
Tel.: +49-511-762-3312
Fax: +49-511-762-3319
e-mail: michel@zsr.uni-hannover.de

Dr P Misaelides (Greece)

Dept. of Chemistry, Aristotle
University
PO Box 1547
GR-540 06 Thessaloniki
Greece
e-mail: misailid@chem.auth.gr

Dr Z Homonnay (Hungary)

Department of Nuclear Chemistry
Eotvos Lorand University
H-1117 Budapest
Pazmany Peter setany 2
Hungary
Tel: (36) 1 209 0593
e-mail: homonnay@para.chem.elte.hu

Prof. Z B Alfassi (Israel)

Department of Nuclear Engineering
Ben Gurion University
Beer Sheva, 84102 Israel
Tel. 972-57-461347
e-mail: alfassi@bgumail.bgu.ac.il

Prof Dr Mauro Bonardi , (Italy)

Nuclear and Radiochemistry,
Universita' degli Studi and National
Institute of Nuclear Physics,
INFN-Milano,

Madrid 28040

Spain
e-mail: cata@ciemat.es

Prof. Gunnar Skarnemark

(Sweden, Gothenburg area)
Dept of Nuclear Chemistry
Chalmers Univ of Technology
S-412 96 Goteborg
Sweden
Tel. +46 31 7722914
e-mail: gunnar@nc.chalmers.se

Prof. T Eriksen (Rest of Sweden)

Dept of Nuclear Chemistry
S-10044 Stockholm 70,
Sweden

Prof. Dr Heinz W Gäggeler (Switzerland)

via F.lli Cervi 201, I-20090 Segrate
(Milano), Italy
Tel : +39 02 5835 9575
E-mail : Mauro.Bonardi@MI.INFN.IT

Dr. I Z Kolar (The Netherlands)

Interfaculty Reactor Institute
Delft University of Technology
2629 JB DELFT,
The Netherlands
Tel. (+31) 15 78 66 19
e-mail: kolar@iri.tudelft.nl

Prof P Hoff (Norway)

Nuclear Chemistry Section,
Department of Chemistry,
University of Oslo, PO Box 1033,
Blindern N-0315 Oslo
Norway
Tel: + 47 22 85 54 84
Fax: + 47 22 85 54 77
e-mail: per.hoff@kjemi.uio.no

Dr R Bojanowski (Poland)

Polish Academy of Sciences
Institute of Oceanology
Dept of Marine Chem. and Biology
Powstancow Warszawy 55
81-712 Sopot
P.O.Box 68, Poland
Tel. (48 58) 51 72 81
e-mail: rbojan@ocean.iopan.gda.pl

Dr V P Kolotov (Russia)

Verdnasky Institute of Geochemistry
and Analytical Chemistry
Kosygin str., 19
Moscow B-334, 117975
Russia
Fax: 7 (095) 9382054
e-mail: kolotov@glas.apc.org

University of Bern
Labor Fur Radio- and Umweltchemie
Freiestrasse 3
CH-3012 Bern, Switzerland
Tel; 41 31-6314264
e-mail: gaeggeler@iac.unibe.ch

Prof Turan Unak (Turkey)

Ege University, Faculty of Science
Dept. of Chemistry, Div. Nuclear
Chem.
Bornova, Izmir 35100, Turkey
e-mail: inacs@alpha.sci.ege.edu.tr

Dr A R Ware (United Kingdom)

Avoncastle, South Lane
Sutton Valence, Maidstone
Kent ME17 3AZ, UK
Tel. (44) (0)1622 842627
e-mail: tonyware@compuserve.com

**Mr S Jerome (International
Committee for Radionuclide
Metrology)**

National Physical Laboratory

Queen's Road

Teddington

Middlesex TW11 0LW, UK

Tel:+44 20 8943 6204

Fax:+44 20 8614 0490

e-mail:ICRM_LLTWG@npl.co.uk

**Dr G Hunter (International Union
of Radioecology)**

7A Park Ave.

Stirling, Scotland

UK FK82QR

e-mail:wohunters@btopenworld.com