RSC | Advancing the Chemical Sciences

The Newsletter of the Royal Society of Chemistry Water Science Forum

Editors Kevin Prior, Richard Allan & Bruce Petrie
c/o Water Science Forum,
Royal Society of Chemistry
Burlington House, Piccadilly
London W1J 0BA

E-mail: rsc@cookprior.co.uk

Alan Tetlow Bursary

In memory of Alan Tetlow the Water Science Forum bursary will help post graduate students or young professional water scientists during the first 10 years of their career.

Contact: Hon Sec,
RSC Water Science Forum
Royal Society of Chemistry
Burlington House, Piccadilly
London W1J 0BA

Sustainable Water

The proceedings from the WSF organised Sustainable Water seminars held at IUPAC are now available from RSC Publishing.

http://www.rsc.org/Shop/books/series/12.asp

WSF at the RSC General Assembly

By Richard Allan

The Water Science Forum was invited to speak at the RSC General Assembly on 13th November. Richard Allan presented the WSF process for conference planning to the representatives of other interest groups. The WSF process for conference planning is an agreed approach to good governance that supports and enables the delivery of our conferences, CPD events and other seminar that we organise on behalf of our members. The process has been designed to be flexible and provide enough evidence so that any given event can be independently audited and demonstrate good value. The WSF also use the process to review the success of conferences and pick up any learning points that can be used to improve future planned events. The presentation was well received and Richard agreed to make the WSF documents available to other interest groups.

The WSF were also part of the exhibition at the General Assembly. Many of the delegates that we spoke to during the course of the day recognised the growing importance of securing global freshwater resources within the context of climate change drivers, economic growth and changes to population demographics. It was great to see that the delegates valued the work of the WSF in this area of expertise.

Working together to improve

By Martyn Jones

What has customer service and efficiency got to do with chemistry.? In the case of the Water Science Forum a great deal. The main principles of excellent customer service are to know who your customers are, to understand what they require from you, to provide it and to measure your performance.

Two years ago the committee of WSF recognised that the way we operated was not efficient enough to withstand the economic downturn and was not offering our customers (you, the WSF members) the service you wished for. It was essential that we changed and quickly.

Our Treasurer drew up a financial forecast to enable us to measure our long term viability. Our Secretary got together a list of members, the areas in which you live and the sectors in which you work. A group of our committee members analysed the list and identified areas where our current committee didn't reflect our membership. I, as Chairman used my regular slot on our meeting agendas to focus committee discussions on the changes needed, and all committee members enthusiastically discussed and agreed ways to improve.

As a result, we now have fewer committee meetings, the meetings are more focussed and efficient, the committee have changed to better reflect the interests of our members, we have remained financially viable and our programme of events has been substantially revised to enable broader appeal and reduce the cost of attending. Time will help us to measure the success of the changes but I am confident that working together we have improved.

Let me know what you think...

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Water Science

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Special points of interest:

- **Changes to the operation of the WSF**
- **NEW: Water droplets—drip feed of water facts**
- **WSF Subscriptions 2010 –2013**
- **WSF Governance**

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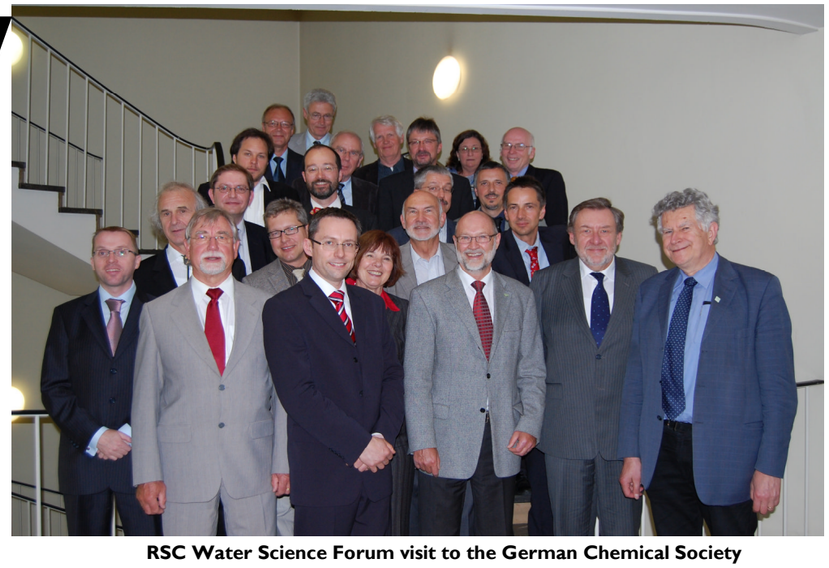
WATERSCIENCE/
INDEX.ASP

"Promoting the professional and scientific interests of members to safeguard the public interest in the application of chemistry in water-related industries."

RSC Water Science Forum visit to the German Chemical Society in Frankfurt.

By Richard Allan

The German Chemical Society (GDCh) is developing its strategy for chemical science priority. As part of this exercise water science priorities are being discussed. The GDCh is keen to work with its European partners to ensure that its priorities are aligned in the interests of good science. To this end the Royal Society of Chemistry (RSC) was invited to present the road map for chemical science priorities and the water sustainability report. The GDCh was keen to understand the process that the RSC went through to develop the road map. The symposium on water sustainability looked at a range of issue which touched upon global water resource management; monitoring the impact of climate change; Innovations in chemical science that will protect drinking water sources; and social justice issues. As the event unfolded it became clear that climate change and population increases will have a significant impact on water availability and quality, with time and that chemical science has a major role to play in all aspects of water management from purifying and treating to capturing and transporting water to point of use.



RSC Water Science Forum visit to the German Chemical Society

Richard Allan (pictured above), Vice-chair of the Water Science Forum and Road Map Water Champion gave a detailed presentation to the GDCh on the road map and emphasised the consultation element of the process. Richard highlighted the work of the Water Science Forum in producing the water sustainability report for the RSC in 2007.

As the meeting went on it was clear that the German priorities were similar to the UK. In particular climate change, energy, urbanisation, food security and water resources were consistent emerging themes.

The GDCh are looking to build upon this initial meeting and work with the RSC to ensure that a consistent approach is adopted going forward. Richard welcomed the opportunity to continue the collaborative approach.

In this issue:

IWA Young Person Award

Rita Henderson, UNSW, Australia

Dr Rita Henderson a corresponding member of the WSF committee and former student has been presented with the International Young Person Award.

Dr Henderson is being honoured through this award for her outstanding career achievements to date. Her success as an academic researcher will without doubt significantly contribute to solving the current and future problems facing the water sector.

Dr. Henderson works in research fields that investigate new monitoring tools and processes to tackle the increasing challenge of water supply within the context of a changing climate. With her research outcomes she has engaged industry partners both in the UK and Australia – a proof of continued industry support for her research proposals. "I am immensely grateful for the guidance and mentorship that I have received so far in my career as a Young Water Professional. I have thoroughly enjoyed working in the water sector, both with respect to my research activities and also in my engagement with the IWA. I look forward to contributing further in the coming years. (Article and image reprinted by permission from IWA 2010 Annual Review)

Subscriptions 2011—2013

2011 all inclusive fee*

2012 all inclusive fee

2013 all inclusive fee

* up to 3 interest groups included in RSC membership, each addition interest groups £10 each

Removal of the toxic form of chromium from groundwater at high pH

By Dr Christine Rogers

At the autumn meeting of the Water Science Forum Committee, Dr Christine Rogers from, Leeds University, gave an interesting talk on her research into the removal from groundwater at high pH of the toxic form of chromium, Cr(VI). A typically contaminated site is shown in figure 1. One method of remediation is to employ permeable reactive barrier (PRB) technology using granular zero valent iron (ZVI) as the reactive material. Fe(0) is oxidised to Fe(III) and the electrons released reduce soluble Cr(VI) to an insoluble Cr(III)/ Fe(III) phase which is nontoxic and environmentally safe. ZVI can be used to reduce chromate from waste with neutral to moderately high pH. However she has established that it is ineffective in chromate solution at pH 12 which is typical of leachate from old COPR "legacy" waste sites.

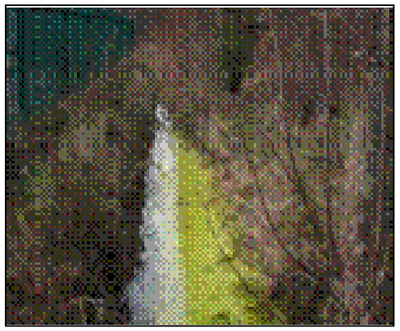


Figure 1. Land contaminated with chromate

In order to find a suitable reactive material, Christine investigated the behaviour of two green rust materials that had been synthesised "in house"; GRA is carbonate green rust and oxidises readily; GRB is a green rust of novel composition, exhibiting some resistance to oxidation. Green rusts are mixed valency iron layered double hydroxide structures that react with chromates in a similar way to ZVI but using ferrous iron as the reductant. The GR materials were very successful at removing chromate from leachate. Both demonstrated rapid kinetics; complete chromate removal took only minutes. One formulation, GRB, was more effective at chromate removal and it exhibited a degree of robustness by remaining effective after limited exposure to air. Figure 2 shows vials containing GR and leachate have lost their yellow colour due to chromate reduction.

Figure 2. L to R: ZVI + Chromate pH 12, ZVI + Leachate, GRA + Leachate, GRB + Leachate

Invaluable support for this research has been provided by the Daphne Jackson Fellowship Trust Scheme, the Green Rust Team (P.I. Dr Sam Shaw, University of Leeds), NERC and the Alan Tetlow Memorial Bursary.

For further information, please contact Dr Christine Rogers, School of Earth and Environment, Faculty of Environment, University of Leeds LS2 9JT. Mailto: C.M.Rogers@leeds.ac.uk

David Livingstone Centre for Sustainability

By Dr Helen Keenan

The founding principle of DLCS is that the challenges of global sustainability are inherently multi-disciplinary. Our role as educators and researchers is to provide a learning environment that fosters cross-disciplinary understanding and collaborative working. The Department of Civil Engineering at Strathclyde supports DLCS to enable better understanding and engagement among the wide range of academics and practitioners who are tackling the challenges of global sustainability. The academic staff in DLCS include economists, planners, scientists and social scientists, all contributing to the Postgraduate Teaching Programme that is uniquely inter-disciplinary. We also work closely with many departments of the university in shared teaching and research programmes.

Our core activities of teaching, research and knowledge exchange are closely integrated. DLCS has a long tradition of supporting Professional Development by providing Open Access to our masters programmes, allowing a range of practitioners to incorporate sustainability into their working roles. The Environmental Studies masters has been running since 1992 and our alumni network is now extensive and influential. This provides opportunities for valuable student research placements. Our close links with policy makers, business and the professions provide a fertile source of ideas for our research portfolio. DLCS continues to expand our teaching and research into emerging fields such as environmental forensics and environmental entrepreneurship and we are building an international training programme in collaboration with UNIDO.

First meeting of GESAMP/UNIDO, working group 37 at DLCS, University of Strathclyde

Another initiative of relevance is the work currently being undertaken by the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP). GESAMP is an advisory body, established in 1969, that advises the United Nations system on the scientific aspects of marine environmental protection. At present, GESAMP is jointly sponsored by nine United Nations organizations, including UNEP; with responsibilities relating to the marine environment.

There is a significant gap in knowledge on sources, releases, transformations and fate of mercury in the aquatic environment. GESAMP has offered to support UNEP's activities to address mercury by undertaking a study relating to this area. The scope of the GESAMP study is to collect and present information on anthropogenic and natural sources and their releases of mercury to the aquatic environment; to describe possible control options; describe physical and chemical forms of mercury emitted to the environment and aquatic and oceanic pathways of mercury (transport and fate); and to describe uptake and transport of mercury and mercury compounds by biota in aquatic environment, including current case studies. In addition, the study will present information on monitoring and evaluation efforts currently being undertaken (for example assessment of monitoring methods, sources of monitoring data and a compilation of mercury transport models for the marine environment). The study is expected to be published in December 2010. The research will be used by UNEP to support the requirements of a new global treaty on mercury that is due to be launched in 2013.

Volume 11 Issue 1

Claire retires as Hon Sec

Claire Stacey retired from the committee of the Water Science Forum at a meeting at Burlington House on 27 January.

She had been a member of the Water Science Forum committee since late 1993 and had been Honorary Secretary since 2007, her second stint in the role.

In recognition of Claire's many years of hard work and dedication to RSC and the Water Science Forum in particular, she was presented with a Long Service Award by Martyn Jones the Chairman of the Water Science Forum. Martyn paid tribute to Claire "Claire has been instrumental in many of the conferences and events that have made the WSF so successful. As a committee member she has played her part in full.

" Water resource issues can only be addressed by scientists, engineers and policy makers working together , "

Professor Tony Allan

Water Droplets:

"water is the only naturally occurring inorganic fluid currently known"