

# International Committee for Ion Exchange

**Newsletter No 5**

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## **Contents:**

Since the last Newsletter there have been two successful international conferences concerning ion exchange and reports of these are included below. In addition, to try to redress the loss of in-house expertise in the use of ion exchange for the purification of water in industry, a training course was held in conjunction with the Cambridge conference.

Unfortunately since the last Newsletter the death of Robert Kunin has been reported and I have included a personal appreciation of his life and contribution to ion exchange prepared by Professor Michael Streat.

I am always interested in receiving any information or ideas of interest to users of ion exchange and in this Newsletter there are items on a new on-line site for publishing ion exchange letters and some information from resin manufacturers.

Michael Cox

## **Robert Kunin (1919 – 2009)**

Robert Kunin died on 6 January 2009, aged 90, at Greenwood House, a nursing home in Ewing Township, New Jersey, USA. He will be remembered as one of the foremost pioneers of ion exchange technology having spent the greater part of his life dedicated to the pursuit of advances in the science and technology of the subject. He trained as a chemist and obtained both a BS and PhD degree from Rutgers University in 1939 and 1942 respectively. He graduated during the Second World War and was privileged to work with many distinguished researchers on the Manhattan Project based in Columbia University during the period 1944-45. It was at this time that he must have become excited about the specialised area of ion exchange and realised its wider potential beyond the strategic nuclear field. After a short spell at the Mellon Institute as a Research Fellow working in the field of catalysis, he moved to the Rohm and Haas Company in Philadelphia. He continued to work there from 1946 for a further 30 years, initially as a Laboratory Head, then Research Associate, Senior Staff Associate, and as Development Manager of the Fluid Processes Chemicals Department.

Bob Kunin was a prodigious researcher with a vast output of written work that included several seminal books, over 350 journal articles and about 40 patents. This is all the more amazing bearing in mind that he spent the majority of his working life in industry. Many academics would be proud to boast such a phenomenal CV. His writings cover the topics of ion exchange, catalysis, adsorption and liquid-liquid extraction. In 1950, he co-authored a book entitled "Ion Exchange Resins" with R J Myers that has stood the test of time as a valuable source of fundamental detail on the preparation and properties of polymeric organic ion exchange resins. Although there are many formative ion exchange books, Bob always sought to draw out the important practical applications of the subject. He is probably best known throughout the ion exchange world for the publication of "Amber-Hi-Lites" that emanated from his laboratory at Rohm and Haas. He wrote and edited 185 issues of this technical information bulletin during the period of rapid growth of ion exchange technology that addressed the hot topics that emerged at the time. Countless practitioners and researchers found Amber-Hi-Lites an essential *aide-memoire* in their daily work. It is hardly surprising that an edited hard copy of this work was compiled and published in 1996 for the benefit of contemporary ion exchange workers.

Robert Kunin was a pioneer of ion exchange and his experience extended from the early development of water treatment processes for the production of drinking water, boiler feed water, etc to the design of desalination plants for the treatment of saline waters. He opened up pharmaceutical applications of ion exchange technology and pioneered advances in the embryonic applications of ion exchange for head-end uranium concentration and purification. His total contributions to our modern understanding of ion exchange and its application are far too extensive to mention in detail-suffice it to say that he was able to discuss and contribute to almost every branch of the subject.

I had the good fortune to help organise the second Society of Chemical Industry International Ion Exchange Conference at Imperial College in 1969. It was at this conference that I first met Bob Kunin in person. Although 40 years ago, I still have a vivid memory of his presence at that meeting. The 1969 meeting attracted many important practitioners and researchers from around the world, especially from the USA and this provoked a vigorous discussion of the merits of the commercially branded ion exchange resins that were available in the marketplace at that time. I remember well the heated debate about the advantages of structured ion exchange polymers that mimicked the behaviour of natural and synthetic adsorbents such as zeolites. The protagonists included Roger Kressman (Permutit Company, UK), Bob Kunin (Rohm and Haas, USA), John Mikes (who was then still working in Hungary) and Professor Saldadze (who was invited from the USSR). It was at this meeting that we were all taught the meaning of such terms as “isoporous” and “macroreticular” ion exchange resins as the industry competed vigorously to promote the advantages of each of the variant materials.

Bob Kunin never failed to attend the subsequent SCI international ion exchange conferences that moved to Cambridge University in 1976 and continued to be held there on a four year cycle up to the present day. He was a major contributor to these conferences (see the photograph below taken in July 2000), either as an authoritative speaker, session chairman, or a wise discussion contributor from the auditorium floor. In 1992, he was awarded the SCI Ion Exchange Award for his distinguished service to the advances of ion exchange technology. I also remember fondly the many personal conversations that I enjoyed in his company, either in Cambridge or at the biannual Gordon Ion Exchange Conferences in New Hampshire, USA. There was no arrogance or superiority when he exchanged ideas with younger colleagues (such as myself)-on the contrary, he would was a fountain of knowledge, experience and advice and I often sat with him into the early hours of the morning to pick up his pearls of wisdom. He has left us all with an enormous legacy of written work and fond memories of his energy, enthusiasm and experience. He is sadly missed by the entire ion exchange community.

### **Professor Michael Street**

*Emeritus Professor of Chemical Engineering, Loughborough University and Visiting Professor, Department of Chemical Engineering and Chemical Technology, Imperial College of Science, Technology and Medicine, UK*

*Note: A special issue of Reactive and Functional Polymers dedicated to Professor Kunin is currently being prepared.*

### **IEX2008, 9-11 July 2008, Cambridge U.K.,**

The Cambridge IEX Conferences provide the opportunity every 4 years for the ion exchange manufacturing and service companies, end users and researchers to meet and present papers on all aspects of theory and practice of ion exchange and adsorbents, and to discuss current practice and future applications. This year's Conference was held at Fitzwilliam College, a delightful venue that fulfilled the required combination of working, social and modern accommodation facilities.

IEX2008 included a two day Training Course on industrial water treatment preceding the main Conference. This intensive Course was aimed at the need for external training created by changes in

industry which have resulted in a gradual loss of in-house skills and training. Presenters from the UK, USA and German industrial water treatment industries covered the theory and practice in industrial boiler water treatment. The course was oversubscribed and following the positive feed back from the 56 attendees it is planned to repeat it.

The Conference was also well attended with over 115 delegates (65% from industry) and was organised in parallel sessions. One stream continued the theme of the Training Course focussing on the production of high purity water for condensate polishing, and applications in the nuclear power industry, environmental and potable water. This stream was aimed at supporting the Training Course and over 50% of the course attendees also attended IEX. The other stream covered developing applications such as bio-processing for fuel and chemical production, new resin developments, membranes and continuing fundamental studies. Poster papers, many of which were more specialised, covered the whole range of topics. The Conference Proceedings contain the majority of the presented papers and a few copies can still be obtained from the SCI.

Student awards kindly donated by the Journal of Chemical Technology and Biotechnology, an SCI/Wiley publication, were presented at this Conference for the best oral and poster presentations. The award for the oral presentation was awarded to: Marcel Riegel, Institute for Technical Chemistry, Karlsruhe Research Centre, Germany and the award for the poster paper was awarded jointly to: Enver Guler, Idil Yilmaz-Ipek, Chemical Engineering Department, Ege University, Turkey and Jakub Piekacz, Chemistry Department, Nicolas Copernicus University, Torun, Poland

The SCI IX Awards are also presented at IEX Conferences. The recipients this year were: Mr Kevin Blaxall, in recognition of his international reputation in the promotion of ion exchange application and his support of the SCI SS&T Group; Professor Jose Luis Cortina, Polytechnic University of Catalunya, Spain, in recognition of his international reputation in ion exchange and his support of SCI activities; Professor Gary Foutch, Oklahoma State University, USA, in recognition of his international reputation in the application, research and teaching of ion exchange.

This IEX Conference has demonstrated that it still has an important role to play as a forum for informing the ion exchange community of current practice and latest developments and the next Conference in 2012 will build on this success.

David Naden  
Chairman IEX2008 Organising Committee  
([dsm@dnaden.freeserve.co.uk](mailto:dsm@dnaden.freeserve.co.uk))

### **Congress on Production of Safe Water – 21-23 January 2009**

The above international congress was organised by the Izmir Metropolitan Municipality and Ege University to create an international platform where the most recent research, experience and applications on water science and technologies were discussed and exchanged. The congress excited considerable interest attracting more than 300 delegates from around the world. The scientific sessions focussed largely on the issue of arsenic contamination and ways of removing it. ([www.izmir.bel.tr/sukongresi/en](http://www.izmir.bel.tr/sukongresi/en)).

The Congress attracted scientists from ion exchange, membrane separations, geological sciences, biology, health sciences, etc. with oral sessions on: occurrence in the environment; health; methods of removal, e.g. adsorption, ion exchange, membrane processes. These sessions included papers from industrial concerns as well as from Universities and in addition to the oral sessions there were two poster sessions. The Congress was wholly supported by the Izmir municipality and local water authorities. Following the Congress delegates had the opportunity of touring the largest plant in the world removing arsenic from water, and also enjoyed a visit to the ancient city of Ephesus.

Selected papers presented at the Congress will be published in a special issue of the journal Environmental Geochemistry and Health (EGAH) and in addition, a book on treatment technologies for the removal of arsenic from drinking water will be published separately.

A fair and symposium on water issues may be organised in Izmir in October 2009, further information on the Congress or this forthcoming meeting can be obtained from Professor Nalan Kabay.

Nalan Kabay

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### **News:**

#### **Forthcoming Conferences:**

##### **2009**

June 12<sup>th</sup> 2009 Prague, Czech Republic ([www.vscht.cz/ktt/workshop/](http://www.vscht.cz/ktt/workshop/))  
International Workshop on Removal of Toxic Species and Recovery of Valuable Components from Water

June 14-18 2009, Wroclaw, Poland ([Andrzej.trochimczuk@pwr.wroc.pl](mailto:Andrzej.trochimczuk@pwr.wroc.pl))  
Ars Separatoria 2009.

##### **2010**

July 2010 ICIE 2010, Melbourne, Australia.

The latest in this series of Japanese ion exchange conferences will be held in Melbourne, Australia in July 2010. A two and half day Conference, Monday to Wednesday, in parallel sessions together with posters is planned, aimed for a balanced industry and academic programme and attendance.

A call for papers flyer has been prepared and a web-site in under preparation. Further information from:

David Shallcross, University of Melbourne, Australia  
([dcshal@unimelb.edu.au](mailto:dcshal@unimelb.edu.au))

##### **2011**

To be decided – Ion Exchange Workshop

It is hoped to hold another ion exchange workshop in 2010 probably in Barcelona, Spain.

Further details from:

Jose Luis Cortina, Universitat Politecnica de Catalunya, Spain. ([jose.luis.cortina@upc.edu](mailto:jose.luis.cortina@upc.edu))  
Michael Cox, ([m.cox@herts.ac.uk](mailto:m.cox@herts.ac.uk))

**Open access journal: Ion Exchange Letters** (<http://iel.vscht.cz/>)

This is an open access internet journal for ion exchange, sorption and metal-ligand interactions. It is focused on students and young researchers but accepts contributions from all scientists. It should provide platform for rapid publication of novel research work. The prerequisite for the quality of an internet journal is the peer review process that should be of the same quality as in the case of classical printed journals and the editors will do all they can to ensure this aim is met. Spreading information about the journal and its content to help others find the relevant articles in Ion Exchange Letters easily is another priority. Thus, all published articles are freely available in PDF format and have a DOI assigned to them. We hope that together we can succeed.

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<http://www.researcherid.com/rid/A-7112-2008>

## **Industrial News:**

### **Purolite News:**

#### South Africa

Purolite have formed a new company Purolite International South Africa Pty Ltd based in Johannesburg. Previously Purolite had operated through agents but now have our own staff and local warehousing in South Africa. Johanna van Deventer is our local Technical Service Manager who attended the Cambridge conference last year with Purolite.

#### New Zealand

Purolite have appointed a new Purolite agent for our market in New Zealand – Vitachem NZ. Vitachem's parent operation in Australia has been our Purolite agent for many years.

#### Ultrapure Resins

Purolite have announced a new range of Ultrapure resins for the Electronics market. Under the "Ultraclean" trade name these products are available in the USA and will shortly be introduced in Europe and Asia.

Brian Winsor ([brian.windsor@purolite.com](mailto:brian.windsor@purolite.com))

### **Lanxess News:**

#### Highly modern water treatment with LANXESS

Products from LANXESS are used around the world to treat drinking water. Ion exchange resins and arsenic absorbers marketed under the names Lewatit® and Bayoxide® play an important role here as they remove contaminants from water and other liquids.

Arsenic is one of the most dangerous contaminants in drinking water. Very high concentrations of arsenic occur in groundwater in many regions of the United States, South America and Asia. High arsenic concentrations are also encountered frequently in Europe, for

example in the United Kingdom. Bayoxide® E33 from LANXESS was engineered on the basis of iron oxide specifically to remove arsenic from drinking and wastewater.

Another process for treating water involves the use of ion exchange resins, such as Lewatit®. They remove pollutants such as nickel, nitrate and certain hydrocarbons from drinking water. One example of industrial application is the treatment of water for power generation processes. In the microchip and pharmaceutical industries, ultra-pure water is indispensable. It is an important application for Lewatit®.

Further information on Lanxess products can be obtained from the Lanxess web magazine: <http://webmagazine.lanxess.com> and news releases at: <http://press.lanxess.com>.

### **University News:**

Professor Nalan Kabay has suggested that a record of recent research work in ion exchange carried out at PhD level is established. Currently, it is becoming fashionable in European Universities to introduce collaborative research topic leading to students studying in different laboratories. Such a database would allow academics with similar research interests in the field of ion exchange to have the possibility to co-supervise PhD students through funding from the EU. An extension of this would be the possibility of announcing research projects on ion exchange through this Newsletter to attract students from overseas.

Professor Kabay would welcome hearing from anyone interested in pursuing these ideas.  
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