

## ACS National Meeting and Expositions\*

More than 7400 technical papers and posters were presented at the 230th National Meeting of the American Chemical Society (ACS) and 313 exhibitors staffed 504 booths. At the Chemjobs Career Center, 1917 job seekers were scheduled for 1678 interviews for 289 positions posted. The technical sessions started on 28 August 2005 and the parallel sessions were distributed in many halls of Washington Convention Center, and surrounding hotels. Several symposia spanned the broad gamut that is chemistry. The technical sessions of inorganic, organic and physical chemistry, which are the backbones of chemistry, attracted most of the crowd in several halls of the Convention Center. Other than these sessions, the worldwide line-up of scientists featured presentations on research in health, medicine, food, agriculture, energy, materials, nanotechnology, biotechnology, green chemistry and the environment. The technical sessions were organized under 30 divisions.

For the almost 2000 undergraduate students at the meeting, this was an exciting and fulfilling activity. Many student participants were busy with the oral and poster presentations, job interviews and various other activities in the exposition booths. A noteworthy event at the Washington meeting was the second Academic Employment Initiative (AEI) poster session held at Sci-Mix. About 170 prospective faculty job candidates described their research for academic recruiters at the AEI event. The AEI programme was proposed in 2004 by the then-ACS President Charles P. Casey and is being supported by a grant from the National Science Foundation. Its goal is to broaden the academic hiring process by making it easier for faculty recruiters to meet and interact with several job candidates in a short time and in a relatively informal setting. The AEI poster session was designed to open up the faculty hiring process by providing a forum for relatively informal interaction between job applicants and representatives of departments seeking new faculty. With per-

sonal interaction before invitations for formal campus visits and interviews, universities do not have to rely solely on paper portfolios and letters of recommendation.

An important feature of the technical sessions was the special lectures dedicated to Prof. Koji Nakanishi, recipient of Tetrahedron Prize for creativity in organic chemistry for 2004, sponsored by Elsevier. Nakanishi was awarded the Tetrahedron Prize on 29 August 2005 by Bruce Ganem for his pioneering research in the use of spectroscopic and chemical methods in determining the chemical structure of natural products, research which has led to the characterization of over 200 bioactive compounds, many of which are endogenous and/or the first members of a new class. His studies with retinal analogues and retinal proteins have made seminal contributions in understanding the structural and mechanistic basis of animal vision and phototaxis. Many eminent chemists presented award lectures, including an introductory remark on Koji Nakanishi by C. H. Wong, editor of *Bioorganic and Medicinal Chemistry*. Nobel laureate K. B. Sharpless honoured Nakanishi with a special lecture on 'Azides and alkynes: tigers in a cage'. Sharpless highlighted the versatile reactive intermediates azides and alkynes as potential building blocks for various heterocyclic compounds. The session concluded with the award address of Nakanishi, on a special topic 'Bioorganic studies on ginkgolides'. In his address, Nakanishi mentioned that research activities on natural products have changed tremendously since the days when he started research during 1950s. The 80-year-old scientist, still active in research said, 'I continue to be strongly attracted to *Ginkgo biloba*, the ginkgolides and bilobalide because of their enigmatic biological effects. With the development of new instrumentation facilities and application of newer techniques of biotechnology, research in natural products is more fascinating'.

On 30 August, another award winner's symposium on Arthur C. Kope was held. K. C. Nicolaou, Scripps Research Institute and University of California, San Diego was selected as the 2005 A. C. Cope Award recipient. Arthur C. Cope Award and Cope Scholar Awards, administered by the ACS, aim to recognize and encourage

excellence in organic chemistry. Tom Peters, international bestselling author, consultant, columnist and stage-performer, gave the keynote address at the award ceremony. Nicolaou, in his award address, explained the art and science of total synthesis and for expanding its frontiers into new domains of molecular complexity and diversity. It was followed by the award addresses of this year's ten Cope Scholars.

R. F. Ismagilov's lecture on physical organic approach to complex reaction networks highlighted the development of new microfluidic technology, which can be used to study time-dependent processes in chemistry, biochemistry and biophysics, as well as the dynamics of complex chemical systems. Knochel ended the morning session with an interesting talk on design, synthesis and characterization of magnesium and zinc organometallics. Knochel's research interests focus on the development of novel organometallic reagents and methods for organic synthesis and asymmetric catalysis.

Eighteen research chemists from five companies were named 'Heroes of Chemistry' by the ACS for improving health and well-being by creating new drugs or other products and inventing environment-friendly and more effective technologies. The awards specifically honour 'chemical innovators whose work has led to the welfare and progress of humanity' in a significant way in the past decade. Revolutionary treatments for psychosis, myeloid leukaemia and dental disease; a process that yields cleaner gasoline; and materials to make smaller denser computer chips and microprocessors are the accomplishments of the 2005 Heroes of Chemistry, who were honoured at the meeting.

A symposium on 'Cosmetic nanotechnology: polymers and colloids in personal care' was held during 30–31 August. The symposium hosted by the Division of Polymer Chemistry highlighted various industrial methods of cosmetic material preparations incorporating nanoparticles and how these particles are being used, as well as potential regulatory implications of their use in light of growing evidence that some particles might pose health hazards. Today, consumers are looking for added benefits from traditional 'beauty' products, such as moisturization and sun protection. Many researchers offered solu-

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tions to the problem of incorporating nanoparticle sunscreens into water for silicone liquid make-up. A symposium on 'Tobacco carcinogens' held on 30 August highlighted the latest findings on how tobacco carcinogens cause cancer. A key objective was to learn more about how tobacco-related cancers may be prevented. It was concluded with a panel discussion on ways to decrease the cancer risk for the 1 billion tobacco users across the globe.

The mission of the Women's Chemist Committee is to attract women to careers in chemical sciences; provide resources for career development; and promote the acknowledgement of accomplishments of women chemists and chemical engineers. There had been a series of articles/interviews with women scientists. 'Leadership styles' by Madeline Jacobs, editor-in-chief of *Chemical and Engineering News*, drew the attention of many women delegates towards the positive ways of leader-

ship qualities. The committee hosted a presidential symposium titled 'Women in industrial chemistry: trends and transitions' on 29 August. The symposium highlighted the challenges, positive influences and personal aspirations of successful women in science and engineering.

A Presidential Symposium on 29 August on 'The future of chemical plant security: where will we be in 2015?' featured a presentation by Charles E. McQueary, Under Secretary for Science and Technology, Department of Homeland Security, on what the U.S. Government was doing to combat chemical threats nationally. The programme was one of a series of symposia related to 'Enterprise 2015', a society-wide effort to identify potential changes in the chemical enterprise in the next decade. The successive sessions included a wide-ranging discussion in which audience members gave their predictions of the state of the chemical sciences ten years from now.

Quite a good number of participants from India were found in different divisions of the technical sessions. Most of them were young chemists working either as postdoctoral fellows or doing their graduate courses (Ph D) in different universities of USA. Many of the research papers reported results of newer synthetic methodologies for novel organic and inorganic compounds. The posters displayed ranged from small heterocyclic compounds with profound biological activities to large supramolecules self-assembled with proper angles and definite shapes.

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## MEETING REPORT

### The great plume debate\*

Earth scientists are currently debating the origin of 'hotspots' such as Hawaii and huge volcanic provinces such as the Deccan and Siberian Traps, and rigorously testing the mantle plume hypothesis that has been extremely popular up until now. An increasing number of workers now regard intraplate volcanism a necessary and natural consequence of plate tectonics, and do not consider mantle plumes – hot, buoyant upwellings from the core–mantle boundary 2900 km below the earth's surface – necessary or viable. In 2003, a conference took place in Iceland that was devoted to developing alternative theories<sup>1</sup>. A second meeting held recently brought together eighty-five scientists from twenty nations, including young scientists, postdocs and students. The meeting was convened by Ian Campbell (Australian National Univ.), Gillian Foulger (Univ. of Durham), James Natland (Univ. of Miami), Dean Presnall (Carnegie Institution of Washington), and W. J. Morgan (Harvard Univ.).

The conference comprised 15 topical sessions, each 90 min long, including three keynote talks followed by intense spontaneous discussion and debate among all participants. In addition, several shorter (5 min) presentations were made by delegates to summarize their posters. After a welcome by G. Foulger who laid out the scientific agenda, including calling for a clear definition of a mantle plume, two talks were given in the first session, 'Plume theory and predictions'. Campbell described the main features of plumes and predictions of the plume hypothesis, that they should: (i) comprise a large head (2000–2500 km diameter) followed by a small (100–300 km diameter) tail; (ii) have higher temperature than adjacent mantle, and be hottest in their centres; (iii) originate from a hot boundary layer – the core–mantle boundary; (iv) produce picrites (though these may not reach the surface); and (v) produce pre-volcanic, domal uplift of 500–1000 m. Morgan discussed plumes and earth evolution and suggested that plumes replenish the asthenosphere. In the next session, 'Alternative theories and predictions', Foulger discussed the generation of melting anomalies by plate tectonic processes, invoking mantle heterogeneity,

stress fields and the recycling of shallow, fusible materials. L. Elkins-Tanton (Brown Univ.) discussed magmatism caused by lithospheric delamination and D. Sandwell (Scripps Inst. of Oceanography) argued that linear volcanic chains may form as a result of either plumes or also crack mechanisms, and most intraplate features have few plume attributes.

In a pair of sessions entitled 'Lithosphere and mantle physics and dynamics', J. H. Davies (Cardiff Univ.) reviewed mantle convection and argued that cylindrical upwellings were inevitable. U. Hansen (Univ. of Muenster) discussed plume generation in mantle-relevant scenarios. J. Tarduno (Univ. of Rochester) reviewed palaeomagnetic evidence for the motion of the Hawaiian hotspot. C. Kinkaid (Univ. of Rhode Island) described the many forms of mantle upwellings encountered in models. E. Burov (Univ. of Paris) showed that lithospheric uplift patterns over plumes can be complex, not simply domal, if the real rheology of the lithosphere is taken into account. S. King (Purdue Univ.) described the theory of edge-driven convection, but considered it unsuitable for hotspots away from large steps in lithosphere thickness. J. van Wijk (Scripps)

\*A report on the American Geophysical Union Chapman Conference 'The Great Plume Debate', held from 28 August to 1 September 2005 at Fort William, Scotland.