

**Pure and Applied Chemistry (PAC) is the official journal of IUPAC. It publishes the main invited lectures of symposia sponsored by the Union; the recommendations of its Commissions on nomenclature, symbols and units, and technical reports on standardization, recommended procedures, collaborative studies and data compilations. Summaries of the most recent IUPAC recommendations on nomenclature and symbols, and technical reports appearing in PAC are published in *Chemistry International* in the section Recent Reports. In this section we take a brief look at symposia and lectures published in recent issues of PAC.**

## Lectures from Symposia

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The April 1997 issue of *Pure and Applied Chemistry* (Vol. 69, no. 4) contains the texts of lectures from three symposia: the International Symposium of Sweeteners, held in Jerusalem, Israel, on 14–20 July 1996; the 16th IUPAC Symposium on Photochemistry, held in Helsinki, Finland, on 21–26 July 1996; and the International Conference on Chemical Physics on the Border of the 21st Century, held in Moscow, Russia, on 16–19 April 1996.

### Sweeteners

The International Symposium on Sweeteners was held under the auspices of IUPAC, the Hebrew University of Jerusalem and the Israel Academy of Sciences. The programme included plenary and contributory lectures from many areas of natural and synthetic sweeteners, structure–activity relationships of sweeteners, mechanism of gustation, health aspects of sweeteners, side effects of commercial sweeteners, use of sweeteners in foods, sensory characteristics of sweeteners, neuro-physiological, inborn and acquired aspects of sweetness, sweeteners in weight control and diabetes and legislation of commercial sweeteners.

Prof. HRH Princess Chulabhorn Mahidol was the guest of honour at the Symposium and, at a ceremony prior to the lectures, she was presented with an Honorary Fellowship by the Hebrew University of Jerusalem. Her presentation, entitled 'Natural products for the improvement of the quality of life', covered work on the utility of some Thai plants as a source of food, including toxicological studies of stevioside and chemical investigations of cassava (*Manihot esculenta* Crantz). Her full text, plus that of the nine other plenary lectures to the conference, is presented in *Pure & Applied Chemistry*, **69**(4), 655–727.

### Photochemistry

The plenary and invited lectures to the 16th IUPAC Symposium on Photochemistry [**69**(4), 729–856] as in previous years, covered a wide range of topics, including theoretical chemistry, biological chemistry, chemis-

try in the solid state, energy transfer and fast reaction kinetics. In particular, many examples were presented of the reactions of short-lived intermediates, such as biradicals, which exemplified their synthetic utility.

The conference concluded with the presentation of the Porter Award to Prof. Noboru Mataga of the Institute of Laser Technology, Osaka, Japan. His lecture presented results from picosecond and femtosecond laser spectroscopy studies on photoinduced transfer phenomena in solutions. Such studies have aided the development of exciplex chemistry. Topics covered included the excited dipolar solute–solvent interactions, solvent and driving force effects on the electronic and geometrical structures of inter- and intra-molecular exciplex systems, energy gap dependencies of charge separation in the fluorescence quenching reactions and charge recombination of product loose ion pairs, non-Marcus type energy gap dependence of charge recombination of compact ion pairs formed by excitation of ground state charge transfer complexes, photoinduced electron transfer coupled with proton transfer or proton shift in benzophenone-amine and some hydrogen bonding exciplex systems, and extensions of exciplex studies to photosynthetic reaction centre models.

### Chemical physics

The International Conference on Chemical Physics on the Border of the 21st Century was held under the auspices of the Physical Chemistry Division in conjunction with the Russian Academy of Sciences, Moscow State University. The four plenary lectures are presented [**69**(4), 857–904], including that of the Conference Editor, Alexander E. Shilov of the Emanuel Institute of Biochemical Physics, Russian Academy of Sciences. Prof. Shilov discussed the contribution of N. N. Semenov, the 1956 joint winner of the Nobel Prize for Chemistry, to 20th century chemistry, not only of his discovery of branching chain reactions and the development of the general theory of chain reactions and thermal explosions, but also of his prediction that biology is likely to play a crucial role in future chemistry.

The other three plenary lectures dealt with: the role of

chemical physics in the science of catalysis and design of new catalytic technologies; non-traditional pathways of solid-phase astrochemical reactions; and the thermodynamics of extreme states of matter. The paper on chemical physics and catalysis was the last scientific communication by Prof. K.I. Zamaraev (immediate Past-President of IUPAC) before his untimely death in June 1996.

### **Solubility phenomena**

The May 1997, **69**(5), issue of *Pure and Applied Chemistry* contains the texts of the plenary and specially invited lectures presented at the 7th International Symposium on Solubility Phenomena, held in Leoben, Austria, on 22–25 July 1996. The symposium was held under the auspices of the IUPAC Commission on Solubility Data, in conjunction with the University of Leoben. Nine lectures are published: Experimental studies in high temperature aqueous chemistry at Oak Ridge National Laboratory; Phase changes and chemical reactions in solid aqueous solutions; Mechanisms of crystallization and transformation of calcium carbonates; Improvement of polymer solubility—influence of shear and of pressure; Solubilities of the common L- $\alpha$ -amino acids as a function of temperature and solution pH; Solubility data in physicochemical data collections and databanks; Use of semi-empirical electrolyte theories for modelling of solution chemical data; Solubility data requirements and new experimental methods in atmospheric aerosol research; and Thermodynamic databases and equilibrium calculations in metallurgical processes.

### **Excitonic processes**

The June 1997, **69**(6), issue of *Pure and Applied Chemistry* contains the texts of nine of the invited lectures presented at EXCON '96, the 2nd International Conference on Excitonic Processes in Condensed Matter, held in Kurort Gohrisch, Saxonia, Germany, on 14–17 August

1996. As Conference Editor, Michael Schreiber of the Institut für Physik, Technische Universität Chemnitz, points out, 65 years after the first papers on excitons by Frenkel, research on excitons has now developed into a truly multidisciplinary field. Excitons play a key role in excitation and energy transfer processes in many molecules, molecular aggregates and crystals, as well as in macromolecular and biological systems.

Included is a selective personal perspective on exciton research, presented by R.S. Knox of the Department of Physics and Astronomy and Rochester Theory Center for Optical Science and Engineering, University of Rochester, New York state. Exciton studies have progressed through many stages that correspond to those in atomic studies, including electronic structure, interactions with other particles, determination of oscillator strengths and ionization rates, bonding into excitonic molecules, condensation and thermal equilibration. Driven by huge advances in computation and experimental techniques, exciton research has essentially evolved from a study of structures to a study of dynamics, Prof. Knox told delegates. 'After 65 years, the exciton survives as neither a museum piece for textbooks nor a purely spectrographic detail. It continues to challenge both theorists and experimentalists, it has attained considerable technological significance, and it participates decisively at the very beginning of earth's food chain', he concludes.

The other published lectures include: Dynamics and instabilities of an exciton in the phonon field and the correlated absorption–emission spectra; Excitons in semiconductor nanostructures with disorder; Spin splittings in nanostructures without inversion symmetry; Hawking process in solids—quantum generation of phonon bursts by a strongly excited mode; Non-linear phenomena in organic multilayers; Photosynthetic light-harvesting; Relaxation processes and self-trapping of excitons in rare gas solids; and Parity-broken and -unbroken self-trapped excitons in alkali halides.