

The National Institute of Standards and Technology (NIST) Celebrates its Centennial

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Introduction

The National Institute of Standards and Technology (NIST) celebrates its centennial this year. NIST, formerly known as the National Bureau of Standards (NBS), was established in 1901 by the U.S. Congress to maintain custody of the national standards of measurement and to develop new ones as needed by the country's rapidly expanding industry. NIST/NBS has grown from a relatively small laboratory with approximately 12 employees to a major research laboratory. NIST has also had a long involvement with IUPAC in many areas of chemical research. The aim of this article is to give a brief history of NIST/NBS, with some discussion of its interactions with IUPAC.

Three excellent written histories of NIST/NBS exist. They include *Measures for Progress: A History of the National Bureau of Standards*, by R. C. Cochrane (National Bureau of Standards, U.S. Department of Commerce, Washington, DC, 1966, 2nd Printing, 1974); *A Unique Institution: The National Bureau of Standards, 1950–1969*, by E. Passaglia and K. A. Beal (NIST Special Publication 925, U.S. Department of Commerce, Technology Administration, NIST, Washington, DC, for sale by the Superintendent of Documents, U.S. Government Printing Office, 1999); and *Responding to National Needs: The National Bureau of Standards Becomes the National Institute of Standards and Technology, 1969–1993*, by J. F. Schooley (NIST Special Publication 955, U.S. Department of Commerce, Technology Administration, NIST, Washington, DC, for sale by the Superintendent of Documents, U.S. Government Printing

Office, 2000). The history described herein has been excerpted from these sources.

Establishment of the National Bureau of Standards (NBS)

The United States was a rapidly changing nation 100 years ago. The country had been primarily agricultural for most of the 19th century, but had undergone extremely rapid industrial growth in the latter part of that century. By 1900, the United States was already a major industrial power, and electricity was arriving in many cities and towns. Articles of commerce require legally based standards to ensure fairness in trade, and there was clearly a need for standards for many physical quantities. In 1836, the United States had established a Bureau of Weights and Measures that maintained standards of mass, length, and volume. In 1884, the Bureau of Weights and Measures also adopted standards for electrical units. Yet, the work of the Bureau of Weights and Measures had very little legal standing, as this function was left to the individual states. Also, the United States had been one of the 17 original member states of the "Convention of the Metre" (1875) that led to the founding of the International Bureau of Weights and Measures (BIPM) in Paris. By the end of the 19th century, several countries had established prominent national standards laboratories, among them the Physikalisch-Technische Reichsanstalt (Germany, 1887) and the National Physical Laboratory (Great Britain, 1899). Surprisingly, at the turn of the last century, the



NBS occupied the former quarters of the Office of Weights and Measures in the Coast and Geodetic Survey Building shown here in 1901.



Samuel Wesley Stratton, the first director of NBS.

United States was the only great commercial nation without a significant standards laboratory. Thus, a convincing case for the establishment of a proper standards laboratory could easily be made on the basis of the rapidly changing nature of the nation's economy, a desire to aid the scientific enterprise, and a wish to be commensurate in this important activity with other modern nations in the new century. As indicated above, the need for standards was particularly acute in regard to the rapidly developing electrical industry. Thus, the administration of President McKinley pressed Congress for the establishment of a modern national standards laboratory. Enabling legislation was passed 3 March 1901, but did not become effective until 1 July 1901. The National Bureau of Standards (NBS) was originally established within the Department of the Treasury; it was moved to the newly formed Department of Commerce (and Labor) in 1904.

NBS was first located in the Coast and Geodetic Survey Building, which was the home of the Office of Weights and Measures in Washington, DC. The first director, Samuel Wesley Stratton, had been a professor of physics at the University of Chicago. He brought incredible talent and energy to the Bureau and worked hard to establish the new laboratory. The original staff consisted

of approximately 12 individuals, but grew to about 800 during the nearly 22 years that he served as director before leaving in 1923 to become president of the Massachusetts Institute of Technology. During his tenure as NBS Director, Dr. Stratton enlisted a very distinguished staff that included well-known experts in various scientific disciplines: E. B. Rosa and Frank A. Wolff (electrical measurements); Charles W. Waidner, Nathan S. Osborne, and Hobart C. Dickinson (heat and thermometry); W. W. Coblenz and W. W. Bates (optics); and W. A. Noyes and W. F.

Hillebrand (chemistry). The emphasis was to serve science and industry in the nation. While the scientific work of the Bureau became ever more well-known in scientific and technical circles, the general public often identified NBS with standards and calibrations. Additionally, NBS publications on subjects of interest to consumers and on popular science subjects attracted significant attention.

Early in 1904, NBS moved to its Connecticut Avenue location in Washington, DC, where it would remain for about 60 years. Relocation of the main labo-



NBS occupied a 3-hectare site about 6 km north of the White House in 1910. Subsequent land purchases expanded the site to about 28 hectares.



The current administration building of the National Institute of Standards and Technology at Gaithersburg, Maryland.

ratory to the present Gaithersburg, Maryland site took place from 1962 to 1969. In 1951, a new NBS laboratory that specialized in cryogenics research was established in Boulder, Colorado. The Boulder laboratory also housed research on radio propagation and became the home of the Time and Frequency Division.

Scientific Work of NBS/NIST

Most of the work of NBS/NIST had its origins in standards. Calibration services available from NBS in its early years were limited to mass, length, volume, temperature, electric potential, and resistance. Much of the early scientific equipment was imported with the assistance of the European standards laboratories. However, as NBS expanded its staff and its expertise, this relatively new laboratory rapidly became an equal to the other great standards laboratories. Because standards are almost always international in nature, collaboration with other standards laboratories and organizations has always been an important organizational goal for NBS/NIST.

Scientific endeavors at NBS/NIST have resulted in two important university collaborations. The first was the Joint Institute for Laboratory Astrophysics (JILA) that was created in 1962 by a memorandum of understanding between NBS and the University of Colorado. The aim of JILA was the study of the basic physics of atoms and molecules in space. The second collaboration was the establishment with the University of Maryland in 1984 of the Center for Advanced Research in Biotechnology (CARB). The main focus of scientific research at CARB is protein chemistry. Currently, structural and theoretical chemistry, molecular biology, and thermodynamics are all applied toward understanding protein structure and function.

NBS programs were clearly affected by national and international events. Thus, NBS played an important role in the early days of government testing. These testing activities included a wide variety of products, many of which were being used by the U.S. Government. However, many of the results of the tests were made available to consumers who benefited from the information. NBS also made significant contributions to the U.S. effort during both world wars. Important breakthroughs were the development of the radio proximity fuse and improved methods for the production of synthetic rubber and aviation fuel. In 1953, the defense

programs that had existed at NBS were transferred to the newly created Harry Diamond Ordnance Laboratories and the Navy Corona Laboratory, both in the Department of Defense. While this transfer involved a loss of over one-third of the NBS staff and more than one-half of its budget, it also meant that the work of NBS was now devoted primarily to standards, civilian technology, and science.

A very important change in NIST's interaction with industry came with the Advanced Technology Program, which was established in 1988 to form a partnership with the private sector for the purpose of accelerating the development of innovative technologies that promised significant commercial payoffs and widespread benefits for the nation. An additional NIST program that interacts directly with industry is the Manufacturing Extension Partnership. It consists of a nationwide network of not-for-profit Centers in over 400 locations nationwide. Its purpose is to provide small- and medium-sized manufacturers with access to technical information that can help them succeed. NIST also manages the Malcolm Baldrige National Quality Award, which aims to encourage improvements in manufacturing performance and in the quality of goods and services. The Baldrige Award consists of a prestigious prize given annually to U.S. organizations that have demonstrated performance excellence. The increasing importance of technology in the work of NBS led to a name change. Thus, in 1988 the name of the agency was changed to "National Institute of Standards and Technology" to reflect more accurately the involvement of technology in the work that was being done.

NIST's work is made available to the public in several forms that include calibration services, standard reference materials, standard reference data, and sci-

entific publications as principal mechanisms for the distribution of services and information. At present, the most widely disseminated standard is time and frequency, which is broadcast from the NIST Boulder laboratory. This information, which is essential to communications and transportation, is now accessed several million times daily. The best source for current information on NIST can be found at its web site: <http://www.nist.gov>.

A reasonably complete summary of the work done at NBS/NIST over the past 100 years would have to encompass essentially all aspects of not only chemistry and physics, but also mathematics and statistics, computer science, engineering, and biotechnology. A compendium of summaries of just over 100 of the “most significant publications” from NIST has been prepared for the NIST Centennial from the approximately 100 000 publications that have come from NBS/NIST. Included in these publications are books and journal articles on a wide variety of topics that have had very significant scientific and/or practical impacts. Several of these publications are cited below, together with selected (and edited) narratives from the aforementioned compendium.

N. S. Osborne, H. F. Stimson, D. C. Ginnings. “Calorimetric determination of the thermodynamic properties of saturated water in both the liquid and gaseous states from 100 to 374 °C”, *J. Res. Natl. Bur. Stand. (U.S.)* **18**, 389–447 (1937). Some of the most important research to meet the need for high-accuracy property data for water was performed at NBS. The effort was led by N. S. Osborne, who, with his colleagues, made measurements of unparalleled accuracy of water’s saturation pressure and its thermodynamic properties. While there was a series of papers on the subject, this particular paper is usually considered the most important. These measurements resulted in international standards that, with modifications, are still in use. It is a testimony to the quality of the measurements in this paper that they are still considered the best available over 60 years later. These measurements provide much of the foundation for the “steam tables” used throughout industry. Thus, they have been integral to the design and operation of most electric power generation facilities existing in the world today, and they also continue to be important in many other industries such as chemical manufacturing and petroleum refining.

C. E. Moore. *Atomic Energy Levels as Derived from the Analysis of Optical Spectra. Vol. I*. Natl. Bur. Stand. (U.S.) Circular 467. U.S. Government Printing Office: Washington, DC (1949). Data on the structure and spectra of atoms is of critical importance for physics, chemistry, astronomy, and a wide variety of applied techni-

cal fields. These data are derived largely from the study of optical spectra and have been presented in thousands of research papers beginning in the early 1900s. By the 1940s, it was apparent that there was a need to compile these data in a readily accessible form. This task was undertaken by Dr. Charlotte Moore of NBS, who was joined by several colleagues in later publications. The resulting Atomic Energy Levels volumes have become among the most widely cited and influential publications in atomic physics.

F. D. Rossini, D. D. Wagman, W. H. Evans, S. Levine, I. Jaffe. *Selected Values of Chemical Thermodynamic Properties*. Natl. Bur. Stand. (U.S.) Circular 500. U.S. Government Printing Office: Washington, DC (1952). Circular 500 represented the culmination of 20 years of work by Frederick Rossini in evaluating and systematizing the world literature in thermochemistry. It tabulated accurate values of the thermodynamic properties of all known inorganic and simple organic compounds in a format that allowed prediction of the outcome of thousands of chemical reactions. Such calculations, which indicate whether a reaction will take place and, if so, the amount of heat released or absorbed, are immensely important in the chemical and energy industries. The late Henry Eyring, one of the major figures of 20th century chemistry, once claimed that Circular 500 saved U.S. industry enough money to pay the entire cost of NBS since its founding. The book also had a major impact on scientific research and education. It was a fixture in every undergraduate chemistry lab for a generation. The U.S. Department of Defense and the National Air and Space Administration programs to develop high-performance rocket engines in the 1950s drew heavily on the data in Circular 500.

W. F. Hillebrand, G. E. F. Lundell, H. A. Bright, J. I. Hoffman. *Applied Inorganic Analysis: With Special Reference to the Analysis of Metals, Minerals, and Rocks*, (2nd ed.), Wiley, New York (1953). This treatise contains an extensive amount of information on classic inorganic chemical separations and quantitative analyses. It helped to shape analytical chemistry worldwide. Six initial chapters describe common analytical methods such as weighing and reagent preparation. In Part II, each element or small group of similar elements has a chapter, giving general chemical considerations, then detailed methods for dissolution, separation, and determination. Nearly 50 years after its publication, there is still no equivalent source for much of the information.

C. S. Wu, E. Ambler, R. W. Hayward, D. D. Hoppes, R. P. Hudson. “Experimental test of parity conservation in beta decay”. *Phys. Rev.* **105**, 1413–1415 (1957). From

the time that parity was introduced as a concept into atomic and nuclear physics, its conservation was an article of faith among physicists. However, it had been pointed out [T. D. Lee and C. N. Yang. *Phys. Rev.* **104**, 254–258 (1956)] that no evidence existed either to support or to refute the conservation of parity in weak interactions. Lee and Yang proposed a number of experiments on beta decays, and on hyperon and meson decays, to resolve the matter, including those of possible asymmetry of the angular distribution of the beta decay of polarized nuclei. This publication reported experiments that showed beta rays that emitted from polarized ^{60}Co atoms, in a thin crystalline layer on single-crystal cerous magnesium nitrate [$\text{Ce}_2\text{Mg}_3(\text{NO}_3)_{12}\cdot 24\text{H}_2\text{O}$] within a demagnetization cryostat, did exhibit this asymmetry, thereby providing unequivocal proof that parity is not preserved. Over preceding years, the authors had developed outstanding theoretical and unexcelled experimental capabilities in this field, so that they were able to grasp the opportunity to carry out the investigation. Its outcome culminated in the Nobel Prize being awarded to Lee and Yang. It also gave NBS well-deserved pride for having participated in one of the major events in the history of physics.

M. Abramowitz and I. A. Stegun (Eds.). *Handbook of Mathematical Functions with Formulas, Graphs, and Mathematical Tables*. Natl. Bur. Stand. (U.S.) Applied Mathematics Series 55. U.S. Government Printing Office: Washington, DC (1964). This 1046-page handbook provides fundamental reference information about mathematical functions that are of use in many applications. The functions covered include elementary transcendental functions, exponential integrals, the gamma function, Legendre functions, Bessel functions, hypergeometric functions, Coulomb wave functions, elliptic functions, orthogonal polynomials, probability functions, and others. In each case, mathematical properties, such as defining differential equations, recurrence relations, integral representations, summation formulas, and asymptotic expansions, are presented, along with descriptions of computational methods. More than half of the book is devoted to numerical tables of function values. Because of its succinct presentation of information of critical use in applications, the Handbook has had enormous impact on science and engineering. It has been continuously in print since 1964, with total sales estimated at approximately one-half million copies. It is among the most widely cited of all scientific publications.

L. A. Currie. “Limits for qualitative detection and quantitative determination: Application to radiochemistry”, *Anal. Chem.* **40**, 586–593 (1968). This classic paper

clearly showed the inadequacies of the many definitions of the term “detection limit”. A notable example was a figure showing eight literature definitions applied to the same measurement problem that spanned a factor of 500 in the quantity measured. More importantly, the author defined statistically defensible expressions for decision limit, detection limit, and quantitation limit that are now the standard for measurement science. This paper has had more than 1 400 citations in the literature and has been used in many analytical chemistry textbooks since the mid-1970s. It has served as a basis for the Detection/Quantification portion of IUPAC Recommendations [“Nomenclature in evaluation of analytical methods including detection and quantification capabilities”, *Pure Appl. Chem.* **67**, 1699–1723 (1995)]. Subsequently, these Recommendations were incorporated in the latest edition of the IUPAC “Orange Book”.

A. Wlodawer, J. Walter, R. Huber, L. Sjölin. “Structure of bovine pancreatic trypsin inhibitor”, *J. Mol. Biol.* **180**, 301–329 (1984). This paper is recognized as a landmark contribution to the field of protein crystallography. It was the first publication to combine X-ray and neutron data in the joint refinement of protein structure, and the first to extend spatial resolution of hydrogen positions in small proteins to $<10^{-10}$ m. By describing the study of two similar crystal structures, the paper presented the first detailed analysis of how protein structure is affected by molecular packing. This paper also established that joint X-ray–neutron refinement could produce structural detail consistent with the then-emerging technique of 2-dimensional nuclear magnetic resonance (NMR) protein crystallography. Thus, this publication had a notable impact on the field of protein crystallography.

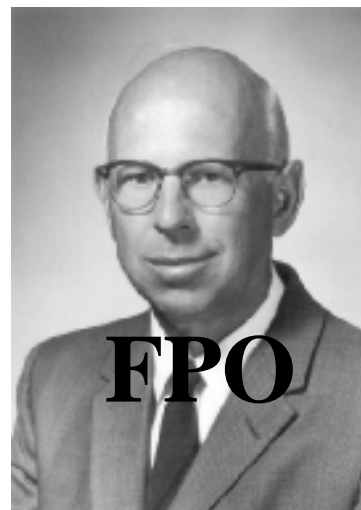
P. D. Lett, R. N. Watts, C. I. Westbrook, W. D. Phillips, P. L. Gould, H. J. Metcalf. “Observation of atoms laser cooled below the Doppler limit”. *Phys. Rev. Lett.* **61**, 169–172 (1988). This paper is one of a series of papers that reported scientific breakthroughs in the cooling and trapping of atoms that led to Bill Phillips being a corecipient of the 1997 Nobel Prize in Physics. By the time of this paper, Phillips and a coworker had shown how an atom beam could be slowed by an opposing laser beam if a varying magnetic field kept the atoms in resonance by compensating for the changing Doppler shift as the atoms decelerated. Phillips and coworkers had also reported the first observation of electromagnetically trapped neutral atoms. However, and most importantly, what was thought to be a fundamental theoretical lower limit on laser cooling of atoms, the Doppler limit, was shown to be violated in this paper. This very surprising discovery resulted from investigations to obtain a better understanding of the basic nature of

the optical cooling process. The result was so surprising that Phillips and coworkers spent considerable time testing the measurement system to make sure that it was working properly. They then determined the velocity distribution of the atoms (and, therefore, the temperature) four different ways before submitting the paper for publication. This work furthered our understanding of the interaction between light and matter and pointed the way for a refined theory to explain these surprising results. Additionally, the possibility of trapping atoms and cooling them to very low temperatures has opened up new science and applications. The present generation of atomic clocks, based on atomic fountains, would not have been possible without sub-Doppler cooling. Ultracold atoms, which have very long de Broglie wavelengths, have given rise to new research fields such as atom optics, atom interferometry, optical lattices, and Bose–Einstein condensation of dilute gases.

This compendium of summaries of NBS/NIST's "most significant publications" has been published under the title *A Century of Excellence in Measurements, Standards, and Technology: A Chronicle of Selected NBS/NIST Publications, 1901–2000*, edited by David R. Lide (NIST Special Publication 948, U.S. Department of Commerce, Technology Administration, National Institute of Standards and Technology, Washington, DC, for sale by the Superintendent of Documents, U.S. Government Printing Office, 2001). Additional NBS/NIST publications included in the book that are of interest to chemists cover the discovery of deuterium, accurate measurements of the gas constant, the photochemistry of small molecules, electron probe microanalysis, advances in surface science, and the behavior of fluids, particularly in the critical region. A general review of NBS/NIST's impact on the 20th century is *NIST at 100: Foundations for Progress*, by Laura Ost (NIST Special Publication 956, U.S. Department of Commerce, Technology Administration, National Institute of Standards and Technology, Washington, DC, for sale by the Superintendent of Documents, U.S. Government Printing Office, 2001).

NBS/NIST Participation in IUPAC

Many scientists on the NBS/NIST staff have participated in IUPAC projects as members of Commissions,



Left: Frederick Rossini, an NBS scientist who helped establish the IUPAC Commission on Chemical Thermodynamics (I.2). Rossini was also the principal author of the widely used publication *Selected Values of Chemical Thermodynamic Properties*. Right: Roger G. Bates, an NBS scientist who served with three different IUPAC Commissions from 1953 to 1983. He also played an important role in the development of the pH scale.

Committees, and Subcommittees. Frederick D. Rossini helped establish the Commission on Thermodynamics (I.2). A particularly impressive record is that of Roger G. Bates, who served on three different Commissions as well as on the Analytical Chemistry Division (V) Committee. His tenure with IUPAC lasted 30 years (1953–1983). A selected, but by no means complete, list of NBS/NIST participants in IUPAC is given below, with emphasis on the past 20 years.

Physical Chemistry Division (I)

Subcommittee on Reference Materials

Stanley D. Rasberry

Commission on Physicochemical Symbols, Terminology, and Units (I.1)

David R. Lide (also President of Physical Chemistry Division, 1983–1987; Chairman of Committee on Chemical Databases, 1985–1989)

Roger G. Bates

William H. Kirchhoff

Commission on Thermodynamics (I.2)

George T. Armstrong

Eugene S. Domalski

Robert N. Goldberg

Peter L. M. Heydemann

Patrick A. G. O'Hare (Chairman, 1989–1995; also served on Physical Chemistry Division Committee, 1996–1999)

Edward J. Prosen

Frederick D. Rossini (led the Commission and its predecessor bodies from 1946–1961)

Howard J. White

Commission on Electrochemistry (I.3)

Roger G. Bates

Commission on Chemical Kinetics (I.4)

Robert F. Hampson

John T. Herron (Chairman, 1993–1997)

Robert E. Huie

Commission on Molecular Structure and Spectroscopy (I.5)

John T. Hougen

Commission on Colloid and Surface Chemistry Including Catalysis (I.6)

Cedric J. Powell

Commission on Biophysical Chemistry (I.7)

Robert N. Goldberg (Secretary, 1996–2001)

Frederick D. Schwarz

Inorganic Chemistry Division (II)

Edward Wichers (President, 1955–1957)

Commission on Atomic Weights and Isotopic Abundances (II.1)

I. Lynus Barnes

Harry S. Hertz

Thomas J. Murphy

H. Steffen Peiser

Robert D. Vocke (Secretary, 1996–1997)

Commission on High Temperature Materials and Solid State Chemistry (II.3)

John W. Hastie

Commission on Isotope Specific Measurements as Traceable References (II.4)

John R. Moody

Robert D. Vocke

Analytical Chemistry Division (V)

Commission on Analytical Nomenclature (formerly V.3/V.1)

Lloyd A. Currie (also served on the Analytical Chemistry Division Committee, 1994–2001)

Commission on Spectrochemical and Other Optical Procedures for Analysis (V.4)

Gregory C. Turk

Commission on Electroanalytical Chemistry (V.5)

Roger G. Bates (Chairman; also served on Analytical Chemistry Division Committee)

Richard A. Durst (also served on Analytical Chemistry Division Committee, 1991–2001)

William F. Koch

Kenneth W. Pratt

Commission on Solubility Data (V.8)

Lewis H. Gevantman (Secretary, 1983–1991)

Events to Mark the Centennial

The week of 1–8 March 2001 was designated as “Centennial Week” at NIST. Major events held at NIST (Gaithersburg and Boulder laboratories) during that week included the following:

- NIST Boulder’s accomplishments and outlook, March 1 (Boulder)
- NIST history and opening Centennial Symposium-Reunion Day for NIST staff and alumni, March 5 (Gaithersburg and Boulder)
- Gala celebration, Ronald Reagan International Trade Center, Washington, DC, evening of March 6
- Symposium on Standards in the Global Economy: A Changing Future, March 7 (Gaithersburg)
- Meeting of the National Metrology Institute Directors (Gaithersburg), March 8

Approximately 65 scientific societies and professional organizations have events to mark the NIST Centennial. These societies include the American Institute of Chemical Engineers, the American Physical Society, the Electrochemical Society, and the Pittsburgh Conference. IUPAC has marked the NIST Centennial by means of a symposium on standards at the 16th IUPAC Conference on Chemical Thermodynamics that was held 6–11 August 2000 in Halifax, Nova Scotia, Canada. Additionally, a session on “Standards and Measurement: Future Directions” will be featured at the World Chemistry Congress to be held 1–6 July 2001 in Brisbane, Australia.

41st IUPAC Council Meeting

Brisbane, Australia, 7–8 July 2001

Election of Officers and Bureau Members

According to Statute 5.401, Council must elect:

- Officers of the Union
- Elected Members of the Bureau

Nominations for the various positions that fall vacant at the end of 2001 must be received by the Secretary General at the IUPAC Secretariat before 7 May 2001, i.e., two months before the start of the Council meeting (Bylaw 2.221). The situation for each position is set out below:

President

Prof. Pieter S. Steyn (South Africa), Vice President and President-Elect, becomes President on 1 January 2002 (Statute 4.2).

Vice President—Vacancy

The vice president to be elected at the 41st Council Meeting will be president-elect, and will become president on 1 January 2004.

Nominations for vice president received (as of 15 April 2001) are as follows: Prof. Hitoshi Ohtaki (Japan) and Prof. Leiv K. Sydnes (Norway).

Prof. Hitoshi Ohtaki (Japan)

Prof. Ohtaki was born 16 September 1932 in Tokyo.

Education and Career: Prof. Ohtaki graduated from the Faculty of Science, Nagoya University in 1955 and obtained M.Sc. and Dr.Sc. degrees in 1957 and 1961, respectively, from Nagoya University. He studied complex equilibria under Prof. L.G. Sillen, Royal Institute of Technology, Stockholm, Sweden, as a Postdoctoral Research Fellow (1961 to 1964). After graduate school, Prof. Ohtaki was appointed Research Associate, Tokyo Institute of Technology (1959); Lecturer (1965) and then Associate Professor (1967), Nagoya University; Associate Professor (1970) and then Professor (1973), Tokyo Institute of Technology; Professor (1988) of the Institute for Molecular Science of the Okazaki National Research Institutes, Director of the Coordination Chemistry Laboratories of the Institute for Molecular Science, and also Dean of the School of Mathematical and Physical Science of the Graduate University for Advanced Studies. He was named Emeritus Professor of the Tokyo Institute of Technology and the Graduate University for Advanced Studies in 1993. He was appointed a Professor at Ritsumeikan University in 1993

and Director of the Institute of Science and Engineering at Ritsumeikan University in 1994. Over the course of his career, Prof. Ohtaki has served as a visiting professor in Sweden, Austria, Thailand, and the Philippines.



Prof. Hitoshi Ohtaki

Awards: Prof.

Ohtaki received the Matsunaga Prize in 1976, the Tejima Memorial Award in 1989, the Takei Prize of the Electrochemical Society of Japan in 1990, the National Medal of Purple Ribbon in 1995, and the Prize for Scientific Merits of the Electrochemical Society of Japan in 2000.

IUPAC Offices and Assignments: Prof. Ohtaki was a member of the Commission on Equilibrium Data (V.6) of the Analytical Chemistry Division of IUPAC from 1975 to 1993 (Associate Member, 1975–79; Titular Member, 1979–85; Secretary, 1981–83; Chairman, 1983–85; National Representative, 1985–89; and Coopted Member of the Division 1989–93). He was also a Member of the Inorganic Chemistry Division from 1987 to 1991. He is currently a Bureau Member of IUPAC, as well as a Member of the Executive Committee.

Related Professional Activities: Prof. Ohtaki was President of the Federation of Asian Chemical Societies from 1997–1999, was formerly President of the Japanese Society of Coordination Chemistry, and also previously served as President of the Association of Japanese Solution Chemists, for which he is now an adviser. He is the Chairman of the Committee for International Affairs of the Chemical Society of Japan. Prof. Ohtaki organized the 6th International Symposium on Solute–Solute–Solvent Interactions in 1982 at Minoo, Osaka, Japan. He was the Chairman of the 2nd and 4th Eurasia Conferences on Chemical Sciences held in Seoul, Korea (1992) and Kuala Lumpur, Malaysia (1994), and, as Secretary General, he organized the 30th International Conference on Coordination Chemistry held in Kyoto, Japan (1994). He was the representative of the Chemical Society of Japan for the Federation of Asian Chemical Societies and the Vice Chairman of the 1995 International Chemical Congress of Pacific Basin Societies (PACIFICHEM'95). He was also Chairman of the 26th International Symposium on Solution Chemistry that took place in Fukuoka, Japan in July

1999. Most recently, he organized the International Symposium on New Horizons of Coordination Chemistry Towards the 21st Century at Kusatsu, Japan in September 2000.

Prof. Ohtaki is a member of the editorial boards of *J. Molecular Liquids*, *J. Solution Chemistry*, *J. Brazilian Chemical Society*, and *J. Malaysian Chemical Society*. He is a member of the Science Council of Japan [President (2000–2003) and formerly Vice President (1996–2000) of Division 4, Pure Science]. He was appointed a professional member of the Council of Science and Technology of the Japanese Government in December 2000.

Research Activities and Interests: Prof. Ohtaki's research interests cover various areas of solution chemistry and coordination chemistry, especially structural chemistry of solutions, including solvents, solvated ions, and complexes existing in solution by means of solution X-ray diffraction. He has also employed EXAFS and neutron diffraction methods in his investigations. He has undertaken thermodynamic studies on solution equilibria; his molecular dynamics simulation studies on dissolution and nucleation processes of crystals have shed new light on the dynamic chemistry of ionic solvation and crystal growth. Recently, his interests have focused on structural studies of supercritical water and other liquids and solvation structures of ions in supercritical fluids. He has been determining structures of short-lived reaction intermediates by the stopped-flow-EXAFS method newly developed by his group.

Prof. Ohtaki has published more than 300 research papers and reviews. He has authored and coauthored 5 books and edited and coedited 3 more books. Prof. Ohtaki has authored chapters in more than 17 books. His book *Chemistry of Reactions in Solutions* has been translated into Chinese. He has translated into Japanese books written by Prof. Viktor Gutmann in Austria and by Prof. Kalman Burger in Hungary.

Prof. Leiv K. Sydnes (Norway)

Date and place of birth: 9 July 1948 in Haugesund, Norway. Married, three children born in 1973, 1975, and 1977.

Education: Cand. mag., University of Oslo, December 1971; Cand. real., Organic Chemistry, University of Oslo, October 1974; Dr. philos., Organic Chemistry, University of Oslo, November 1978.

Employment: Research Associate, University of Oslo, 1974–1978; Postdoctoral Fellow, University of Western Ontario, Canada, 1978–1980; Associate Professor, University of Tromsø, 1980–1986; Visiting Professor, Iowa State University, USA, 1985–1986; Professor, University of Tromsø, 1987–1993; Adjunct Professor, University of Tromsø, 1993–1998; Visiting Fellow, Australian National University, Canberra, 1998; Adjunct Scientist, Norwegian Institute for Air Research,

1998 to present; Professor, University of Bergen, 1993 to present.

Research and Scientific Publications: The M.Sc. and Dr. philos. degrees were earned under the supervision of Prof. Lars Skattebøl, University of Oslo, on the basis of these describing research in the field of *gem*-dihalocyclopropanes.

In Canada, Prof. Sydnes worked with organic photochemistry in the research group of Prof. Paul de Mayo, Photochemistry Unit, University of Western Ontario. The academic year 1985–86 was devoted to organometallic chemistry, which was employed to synthesize prostaglandin derivatives in the group of Prof. Richard Larock, Iowa State University.

Prof. Sydnes's research is mainly concentrated on organic synthesis with emphasis on cyclopropane chemistry and photochemistry. Many of the problems currently investigated are related to the preparation of biologically active molecules. So far, the research has resulted in 100 contributions in publications with a referee system. The research has also been presented in numerous lectures/poster presentations at conferences in Norway and abroad.

Nonscientific Publishing: Since 1976, Prof. Sydnes has also been involved in various kinds of nonscientific publishing related to chemistry. He has written more than 60 articles in national periodicals, including book reviews of foreign scientific books, papers about chemistry topics for nonspecialists, discussion papers about teaching, etc. He has written 5 books covering laboratory work in introductory and intermediate organic chemistry at the university level. He has published 19 high school textbooks in chemistry and 2 textbooks for chemical colleges. He has contributed one or more chapters to 18 technical or more general scientific reports.

Other Professional Activities: In addition to having been and being involved in a large number of committees and boards at the University of Tromsø and now at the University of Bergen, Prof. Sydnes has been engaged in professional activities as follows: Chairman, Division of Teaching, Norwegian Chemical Society, 1976–78; Chairman, Northern Norway Section, Norwegian Chemical Society, 1981–83; Board Member,



Photo by Lars Ole Ørjasæter

Prof. Leiv K. Sydnes

Norwegian Chemical Society, 1983–89; Vice President, Norwegian Chemical Society, 1989–92; President, Norwegian Chemical Society, 1992–96; Bureau Member, IUPAC, 1994 to present; Member of IUPAC Strategy Development and Implementation Committee (SDIC), 1997–98; Associate Member of IUPAC Organic Chemistry Division Committee, 1998–99; Member of IUPAC Subcommittee on Organic Synthesis, 1998 to present; Member of Project Committee of IUPAC Bureau, 1999–2001; Member, European Communities Chemistry Council (ECCC), 1994 to present; Vice Chairman, ECCC, 1997–2001; Member, European Communities Registration Board (ECRB), 1996 to present and Chairman, 2001; Executive Committee Member, Federation of European Chemical Societies (FECS), 1998–2001; Member, European Cooperation in the Field of Scientific and Technical Research (COST) D2 Management Committee (Selective Synthesis), 1992–97; Member COST D12 Management Committee (Organic Transformations: Selective Processes and Asymmetric Catalysis), 1998–2002, Vice Chairman, 2000, Chairman, 2001; Member, International Association for the Promotion of Cooperation with Scientists from the New Independent States of the Former Soviet Union (INTAS) Assessment Panel, Brussels, 1994; Member, Editorial Board, *Acta Chemica Scandinavica*, 1989–94; Member, Editorial Board, Norwegian Journal of Chemistry (*Kjemi*), 1976 and 1989 to present; Organizer of the National Organic Chemistry Meeting in 1988, 1992, and 1996; Organizer of the Nordic Natural Product Meeting in Tromsø in 1982; Chairman, Organizing Committee of the National Laboratory and Chemical Fair in 1993, 1995, 1997, 1999, and 2001; Organizer of the COST D12 Conference on Organic Transformations in Fefor, Norway, 12–15 October 2000; Member and Chairman of the Board, Unilab Analyse AS, 1988–92; Member/Vice Chairman of the Board, Tromsø Research Park AS, 1990–1999; Member of the Board, Marine DNA, Tromsø, 1991–1992.

Awards: Kyoto Institute of Technology Lectureship, 1990; Thaulow Prize, 1995; elected Member of the Norwegian Academy of Science and Letters, 1999.

Past-President

The retiring President, Dr. Alan Hayes (UK) will remain an Officer (Statute 6.1) and a Member of the Bureau for a period of two years (Statute 7.2).

Secretary General

Dr. Edwin D. Becker (USA), the present Secretary General, was elected to a second four-year term (2000–2003) in 1999.

Treasurer

Dr. Christoph F. Buxtorf (UK), the present Treasurer, was elected to a four-year term (2000–2003) in 1999.

Bureau—Six Vacancies (Minimum)

According to Statute 7.2, the Bureau consists of the Officers, the Presidents of the Divisions/Sections, together with not less than ten other Members elected by Council, who shall be known as “Elected Members”. At the conclusion of the 40th Council in Berlin, there were ten Elected Members of the Bureau. At the 41st Council, the Bureau will make recommendations to Council as to the number of Elected Members (ten or more), who should be on the Bureau for the succeeding two years.

Elected Members are elected for a period of four years, and they are eligible for election for a second period of four years.

No Adhering Organization shall have more than one Elected Member of the Bureau.

Statute 7.2 also states that “the principle of fair geographical representation of Members shall be taken into account”.

Elected Members of Bureau, retiring in 2001, who are not eligible for reelection, but may be nominated for another office:

Prof. E. J. Grzywa (Poland); Prof. J. W. Lorimer (Canada); Prof. L. Sydnes (Norway); Prof. C.-H. Zhang (China).

Elected Members of Bureau, retiring in 2001, who are eligible for reelection for a further four-year period:

Dr. E. P. Przybylowicz (USA); Prof. G. Somsen (Netherlands).

Elected Members of Bureau, who were elected at the 40th Council until 2003:

Prof. N. J. Moreau (France); Prof. O. M. Nefedov (Russia); Prof. H. Ohtaki (Japan); Prof. G. M. Schneider (Germany).

At least six Elected Members of the Bureau must be elected at the 41st Council in Brisbane, i.e., the minimum number of ten Elected Members (Statute 7.2) less the four Elected Members who continue in office until 2001.

Nominations for Bureau received (as of 28 March 2001) are as follows: Prof. R. G. Gilbert (Australia), Prof. Dr. S. Gültekin (Turkey), Prof. G. Horvai (Hungary), Prof. Murray Moo-Young (Canada), Dr. E. P. Przybylowicz (USA)—reappointment, Dr. A. Smith (UK), Prof. Gus Somsen (Netherlands)—reappointment.

Prof. R. G. Gilbert (Australia)

Prof. Bob Gilbert was born on 21 January 1946 and resides in Sydney, his natal city.

Education and Career: Studied at the University of Sydney and graduated with the University Medal in



Prof. Bob Gilbert

1966. He completed his Ph.D. at the Australian National University, Canberra, in 1970, on the theory of unimolecular reactions. He did a post-doctoral fellowship at MIT (Cambridge, MA, USA) as a Harkness Fellow,

working on chemical dynamics. He returned to Sydney University as a Lecturer in 1970. He holds a Personal Chair in Polymer Chemistry (appointed in 1992). In 1999, the Key Centre for Polymer Colloids was established (by the Australian Research Council) within the University of Sydney, with Prof. Gilbert as Director. In the mid-1970s, his interest in polymers was aroused by his colleague, Prof. Donald H. Napper, and the two collaborated for many years.

Prof. Gilbert's research interests over the years have been in the theory of chemical dynamics (with concomitant experimental work), particularly in gas-phase unimolecular reactions, but also including solution dynamics, and in the fundamentals and applications of the formation and properties of polymer colloids. He developed theories to understand the pressure dependence of unimolecular reactions, including models for collisional energy transfer and for microscopic rate coefficients for barrierless reactions. In 1990, he published (with Dr. Sean Smith) a book on the theory of unimolecular reactions, which is seen as definitive. In polymer colloids, his work has included the development of means, using appropriately designed experiments, to determine rate coefficients for individual processes in these very complex heterogeneous systems, and then using the data so obtained to determine mechanisms. His book on this topic, published in 1995, is regarded as a landmark. Most recently, his research has broadened to look at polymer colloids in natural systems (e.g., starches and natural rubber latex), and to bridge the gap between chemical and chemical engineering sciences in the manufacture of industrial products. He consults widely with industry around the world.

Prof. Gilbert speaks and lectures in English, French, and German. Over the years, he has supervised 38 Ph.D. and M.Sc. students, and 22 postdoctoral fellows. He received an Excellence in Teaching Award at the University of Sydney in 1990. His awards include both the Polymer and Physical Chemistry Medals, and the Smith Medal, of the Royal Australian Chemical Institute. In 1994, he was elected a Fellow of the Australian Academy of Science. He is author of two books, three patents, and about 250 papers. His hobbies are music and

surfing (he was champion in his age division in the Australian bodysurfing titles in 1986 and 1988).

Related Professional Activities: Prof. Gilbert has served on the editorial boards of a number of journals: *International Journal of Chemical Kinetics*, *Chemtracts*, *Macromolecular Chemistry*, *Trends in Polymer Science*, *Polymer*, *Polymers for Advanced Technologies*, *Journal of Rubber Research*, *Biomacromolecules*, and *Journal of Polymer Science*. For several years, he was the Chair of the Editorial Board of the *Australian Journal of Chemistry*, at a time which saw major changes in this journal. He has been Chair of the Physical Chemistry and Polymer Divisions of the Royal Australian Chemical Institute, and on the executive board of that organization in various capacities. He served on the Australian National Committee for Strategic Review of Chemistry Research in Australia in 1992–1993. He has been Secretary of the International Polymer Colloids Group from 1997, and is Vice Chair of the Gordon Conference in Polymer Colloids in 2001. He served on the RACI International Relations Committee from 1995 to 2000.

IUPAC Offices and Assignments: Prof. Gilbert's involvement with IUPAC started in 1986, when he led the Working Party on Modeling Polymerization Kinetics and Processes; he passed the baton of leadership of this group to Prof. Michael Buback in 1998, but is still an active Task Group member. This WP has produced a series of papers on rate coefficients in free-radical polymerizations that are widely cited in the international literature, and has established benchmark procedures for consistent measurement procedures and values for these quantities. He became a Titular Member in Commission IV.2 in 1992. In 1996, he was elected Vice President and then President (from 1998) of the Macromolecular Division. He served as Chair of the IUPAC Division Presidents' meeting in 1999. He was Chair of Macro98 (the IUPAC World Polymer Conference) in 1998. He was leader of the Australian delegation to the IUPAC General Assembly in 1995 and 1997, and has been a member of the Australian delegation to every General Assembly since 1992. He was the Convener of the IUPAC "New Directions" Asian Summit held in Singapore in 1997. He was a member of the IUPAC Strategy Development and Implementation Committee in 1997, which produced a blueprint for the major reforms that IUPAC is now implementing. He served as a member of the organizing committee for the IUPAC Congress, Berlin, in 1999, and of a number of IUPAC-sponsored conferences around the world. He is Conference Cochair, and Chair of Scientific Program Committee, of the IUPAC Scientific Congress in 2001.

Prof. Dr. Selahattin Gületkin (Turkey)

Prof. Dr. Gületkin was born on 7 November 1950 in Erzurum, Turkey; he is married with four children.

Education and Career: Prof. Gületkin received B.S.

and M.S. degrees in chemistry in 1973 from Istanbul University and also earned M.S. (1977) and Ph.D. (1980) degrees in chemistry from the Massachusetts Institute of Technology (MIT).

Since October 2000, Prof. Gületkin has been Professor of Chemistry at Dogus University in Istanbul. He previously (1994–2000) was a professor in the Chemistry Department at Yildiz Technical University in Istanbul. His prior professional positions have included serving as a visiting professor at MIT, associate and assistant professor in the Chemical Engineering Department at King



Prof. Dr. Selahattin Gületkin

manager in the Quality Control Division at the SABA Pharmaceutical Company in Istanbul.

Research Activities: Prof. Gületkin has research interests in kinetics, reactor design and catalysis, mathematical modeling of chemical systems, computer simulations, industrial chemical processes, electrochemistry, and transport phenomena. He has more than 50 publications in areas of his research activities, and his work has been cited more than 120 times in the *Science Citation Index*. He has presented papers at scientific conferences all over the world during the past two decades. Prof. Gületkin has supervised work on 5 doctoral and 12 master's thesis.

Related Professional Activities: Prof. Gületkin currently serves as Secretary General of the Turkish Chemical Society and Executive Committee Member of the Federation of European Chemical Societies (FECS). He is actively involved in deliberations on how to make chemistry a popular profession in Turkey. He has recently coauthored the *Dictionary of Chemistry and Chemical Engineering Terms: English-Turkish and Turkish-English* (Istanbul, 2000).

Awards: Prof. Gületkin has won Distinguished Researcher (1986) and Distinguished Teacher (1989 and 1993) Awards at KFUPM. He is also the recipient of Incitement Awards in Science and Engineering at Yildiz Technical University (1996, 1998, and 1999).

Fahd University of Petroleum and Minerals (KFUPM), assistant professor at Istanbul University, teaching and research assistant at MIT, lecturer in the Chemical Engineering Department at Istanbul University, second lieutenant in the Turkish Army, and

Prof. George Horvai (Hungary)

Prof. Horvai was born on 14 January 1949 in Budapest, Hungary, and he is married.

Education and Career: Prof. Horvai received M.S. and Ph.D. degrees in chemistry and chemical engineering from the Technical University of Budapest, where he studied with Profs. E. Pungor and K. Toth. He also holds an M.S. in applied mathematics from R. Eotvos University, Budapest. During his predoctoral studies, he worked in the laboratories of K. Schwabe (Meinsberg, Germany), P. Kivalo (Finland), and W. Simon (Zürich, Switzerland).

Since 1973, Prof. Horvai has been on the faculty of the Technical University of Budapest, where he currently serves as vice rector for scientific and international affairs and head of the Division of Chemical Information Technology. He holds the rank of full professor.

Research Activities: Prof. Horvai has research interests in physical chemistry, computer modeling and applications of ion-selective electrodes, electrochemical detection in HPLC and FIA, automation in the wet/pharmaceutical analytical laboratory, and environmental analysis. He is the author or coauthor of more than 60 refereed papers, and he holds six Hungarian patents and one U.S. and European patent. His research collaborations and visits have included R. G. Bates (University of Florida, USA), R. P. Buck (University of North Carolina, USA), T. A. Nieman (University of Illinois, USA), F. A. M. Leermakers (Wageningen University, Netherlands), and six European research laboratories in the EU IV-th Framework Program.



Prof. George Horvai

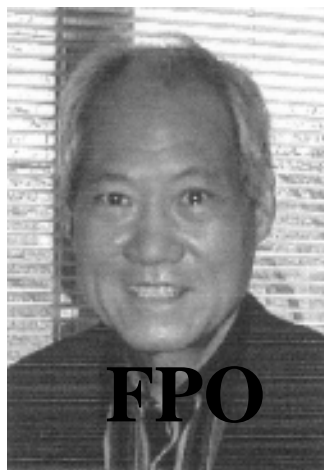
Awards: Prof. Horvai has won the “Academy Prize” of the Hungarian Academy of Sciences and the “Outstanding Inventor” prize of the Hungarian Minister for Industry.

IUPAC Activities: Prof. Horvai currently serves as Titular Member and Secretary of the Commission on Fundamental Environmental Chemistry (VI.1). He is Chairman of the Hungarian Academy of Sciences and a member of the Hungarian Chemical Society. He has also served on the Analytical Chemistry Division (V) Working Group on Automated Analysis.

Prof. Murray Moo-Young (Canada)

Prof. Moo-Young is on the Chemical Engineering faculty at the University of Waterloo, where he holds a Research Chair in Industrial Biotechnology and is also the UNESCO-designated director of the Microbial Resource Centre.

Education and Career: Prof. Moo-Young received his university education at London (B.Sc., Ph.D.), Toronto (M.A.Sc.), and Edinburgh (postdoctorate). Before coming to Waterloo, he was a faculty member at the Universities of Toronto and Western Ontario. Prof. Moo-Young has many honors, including a FRSC (Fellow of the Royal Society, Canada), “the highest accolade of an academic in Canada”; the Engineering Medal



Prof. Murray Moo-Young

of the Association of Professional Engineers for “innovation”; and in 1999, the premier award of the Biochemical Technology Division of the American Chemical Society, the Marvin Johnson award, for “outstanding research contributions” to the subject. He is an active consultant to industry and government agencies worldwide, including ICI, Dupont, Cetus/Chiron, and NASA. To date, his work has produced nine patents, 286 papers, and 11 books, including the major multivolume reference work, *Comprehensive Biotechnology*. Prof. Moo-Young is editor of the journal *Biotechnology Advances*. He has been featured as an inventor in media such as *People* and *New Scientist*.

IUPAC Activities: Since 1978, Prof. Moo-Young has served IUPAC through its Commission on Biotechnology (III.4), moving through the ranks from National Representative, Titular Member, to Vice Chairman, and now National Representative again. He has written articles for *Pure and Applied Chemistry*; was on the advisory committees for several IUPAC publications including the *Glossary of Terms in Biotechnology*; and served on the scientific committees for most of the IUPAC-sponsored series, *International Biotechnology Congress* (in Germany, Australia, USA, France, India, Canada, and Japan).

Dr. E. P. Przybylowicz (USA)—Reappointment

Education and Career: A native of Detroit, Michigan, Dr. Przybylowicz received a B.S. degree in chemistry from the University of Michigan and a Ph.D. degree in

analytical chemistry from Massachusetts Institute of Technology. In 1991, after over 35 years with the Eastman Kodak Company, Dr. Przybylowicz retired as Senior Vice President and Director of Research. He joined Kodak as a research chemist in the Chemistry Division at the Research Laboratories in September 1956. During his career, he had increasing technical and managerial responsibilities in the basic sciences, engineering, and product development as well as in the clinical and copy products businesses. He became Assistant Director of Kodak



Dr. E. P. Przybylowicz

Research Labs in 1983, and he was named Director of Research and elected as Senior Vice President of the company in August, 1985.

Dr. Przybylowicz has been active in a number of programs that are focused on the commercialization of technology and in stimulating closer working relationships between industry and academia. From 1987 to 1997, he was a member of the Board of the New York State Science and Technology Foundation, a state foundation that has programs designed to stimulate the transfer of technology between universities and industry. He is also a Commissioner of the U.S.-Polish Joint Fund for Cooperation in Science and Engineering, a program that fosters the collaboration of Polish and U.S. scientists. In the past decade, he cochaired conferences and workshops on technology transfer in Poland, the Czech Republic, and Russia.

From April 1994 to March 1996, Dr. Przybylowicz was Director of the Chester F. Carlson Center for Imaging Science at the Rochester Institute of Technology. He is currently on the Industrial Advisory Committee for the Center. In March 1996, he became Assistant to the Dean, College of Science, Rochester Institute of Technology. He has published over 20 technical articles and 2 books in the fields of chemistry and photography, and he holds 4 patents in related fields.

Dr. Przybylowicz was elected a member of the National Academy of Engineering in 1990, and he is active on a number of National Research Council committees. In 1997, he chaired the Panel on Black and Smokeless Powder, a study directed by the Federal Antiterrorism and Effective Death Penalty Act of 1996.

The report of this panel was released in October 1998. He is currently a member of the Chemical Sciences Roundtable of the National Research Council. He is an emeritus member of the Industrial Research Institute. He also serves on a number of university visiting committees in engineering and the sciences.

IUPAC Activities: Since 1993, Dr. Przybylowicz has been a member of the IUPAC Finance Committee and is currently its Chairman. In 1997, he was elected to the IUPAC Bureau and Executive Committee, the governance bodies of IUPAC. He has served on the U.S. National Committee for IUPAC since 1994, and he is currently its Chairman.

Awards: Dr. Przybylowicz is the recipient of numerous awards. The Rochester Engineering Society awarded him the 1992 Leo East Award as "Engineer of the Year." In 1993, he was the recipient of the Greater Rochester Chamber of Commerce "Civic Award in Science and Technology", and he won the 1994 Distinguished Alumni Award from the University of Michigan, Department of Chemistry. In 1995, he was elected Honorary Member of the Society for Imaging Science and Technology "for his lifelong contributions to the advancement of imaging science and engineering, from his technical contributions at Kodak, to his work to enhance industry/university/government cooperation and to expand education in imaging." In 1996, he was awarded the Malcolm E. Pruitt Award of the Council on Chemical Research for the promotion of university-industry relations.

Dr. Alan Smith (UK)

Dr. Alan Smith was born in Sherwood Forest, England, 13 December 1943.

Education and Career: Dr. Smith gained his B.Sc. (Hons.) in Chemistry at Queen Mary College, University of London in 1965, during which time he had his first publication while still an undergraduate. He stayed on there and in 1968 received a Ph.D. in physical organic chemistry. He was then awarded a NATO Postdoctoral Fellowship for 2 years (1968–1970) and spent the first year on research into heterocyclic chemistry at the Technical University in Delft, Netherlands. The second year was spent in the School of Pharmacy, Nottingham University.

He joined the staff of the University of East Anglia (1970–1972), where he lectured and carried out research for the International Institute of Synthetic Rubber Producers. From 1972 to 1987, he worked at Laporte, during which time it became a leader in speciality chemicals. As Head of Research and Development, he had worldwide responsibilities for Laporte's technology, and he also looked after their laboratories for Interlox, Laporte's joint venture with Solvay. From 1987 to 1991, he was on the Board of BDH/Merck in the UK, where

he was Technical Director and ran their Advanced Materials Business. From 1991 to 1996, he returned to Laporte as the Head of Group Technology, with responsibilities for worldwide technical matters, especially relating to their extensive program of acquisitions. In 1996, he set up AZ-TECH Consultancy, which advises on scientific technical matters and acquisitions and mergers, and included the post of part-time Technical Director for BIP, Ltd.



Dr. Alan Smith

Offices and Assignments: Dr. Smith served on the Chemical Industry Association's Science, Education, and Technology Committee from 1986 to 1996. He is currently president-elect for the Industrial Affairs Division of the Royal Society of Chemistry, and is also on the following RSC committees: Annual Conference Committee, Innovation Team Award Committee, and the Research Fund Committee. He is a member of the Industrial Advisory Boards for Chemistry at Imperial College and Bristol University, and lectures at the University of Strathclyde and Nottingham University. He was on a CBI task force to put an industrial input into the next Research Assessment Exercise for UK universities. He is on the Board of the latest Faraday Partnership on Colloids, established by the UK Government. From 1995 to 1999, he was on the Chemicals Panel of the Government's Foresight exercise. From 1999 to date, he has been on the Materials Panel, and continues to lecture extensively on Foresight. He is a Fellow of the Royal Society of Chemistry and a Fellow of the Linnean Society.

IUPAC Activities: From 1994 to date, Dr. Smith has been on the Committee of Chemical and Industry, and from 1995 to 1999 was on the Editorial Advisory Board for *Chemistry International*. From 1998 to date, he has been a member of the CHEMRAWN Committee. From 1997 to 2001, Dr. Smith has been a delegate for the UK's National Committee, and for 2001 he is chairman of the UK delegation.

Prof. Gus Somsen (Netherlands)—Reappointment

Prof. Somsen was born on 23 July 1932; he is married with four children.

Education and Career: Prof. Somsen graduated in chemistry in 1956 after study at Vrije University in Amsterdam and at the University of Utrecht. He received his Ph.D. in physical chemistry after working with Prof. Jan Coops.

After military service as an officer in the field artillery (1956–1958), Prof. Somsen joined the faculty of the Department of Chemistry at Vrije University as an instructor (1959–1964). He was subsequently promoted to associate professor (1964–1971) and then to professor of physical chemistry (1971–1997). Prof. Somsen served as head of the Department of Chemistry (1980–1983 and 1993–1997), vice rector (1983–1985), dean of faculty (1985–1987), and member of the University Council (1988–1990) at Vrije University. He has been an emeritus professor at Vrije since 1997.

Research Activities: Prof. Somsen has research interests in experimental chemical thermodynamics, physical chemistry of solutions, and liquids and liquid structures. He has authored about 120 publications on thermochemistry and physical chemistry of solutions.

Related Professional Activities: Prof. Somsen holds memberships in the Koninklijke Nederlandse Chemische Vereniging (Netherlands) and the Royal Society of Chemistry (UK). He has served as a member of the editorial advisory boards of *Recueil des Travaux Chimiques des Pays-Bas* (1981–1989), *Journal of Chemical Thermodynamics* (1985–1990 and chairman, 1991–2000), and *Journal of the Chemical Society, Faraday Transactions* (1990–1993).

Prof. Somsen has also served as secretary of the Division on Liquids and Interfaces of the Dutch National Organization for Chemical Research (SON, 1977–1980 and 1985–1989), director of the North American Calorimetry Conference (1977–1979, 1984–1986, and 1992–1994), member of the Academy Commission on

Chemistry of the Koninklijke Nederlandse Akademie van Wetenschappen (1981–1991), and member of the National Reviewing Committee on chemical education at the universities in The Netherlands.

Awards: Prof. Somsen has won the Medal Uniwersytetu Łódzkiego from the University of Łódź, Poland (1994); the Swietoslowski Medal from the Polish Society of Calorimetry and Thermal Analysis, Poland (1994); and a designation as Officer in the Order of Orange Nassau from Her Majesty, the Queen of the Netherlands (1995).

IUPAC Activities: Prof. Somsen currently serves as an Elected Member of the IUPAC Bureau (1998–2001), a Member of the Project Committee of the Bureau (1999–2001), and an Associate Member of the Physical and Biophysical Chemistry Division (I) Committee (2000–2001). His previous IUPAC positions include the following: Member (1977–1985) and Chairman (1985–1989) of the Commission on Thermodynamics (I.2); Member (1990–1991), Secretary (1992–1993), Vice President (1994–1995), President (1996–1997), and Past President (1998–1999) of the Physical Chemistry Division (I); and Chairman of the Ad Hoc Committee on Project Evaluation Criteria (1998).



Prof. Gus Somsen

IUPAC Prize for Young Chemists

Winners of the 2001 Prize

Winners of the 2001 IUPAC Prize for Young Chemists, as announced recently, are Soumyakanti Adhikari, University of Mumbai, India (currently with Radiation Chemistry and Chemical Dynamics Division, Bhabha Atomic Research Center, Mumbai, India); Michelle Louise Coote, University of New South Wales, Australia (currently with IRC in Polymer Science, University of Durham, England, UK); Stephan Link, Georgia Institute of Technology, Atlanta, Georgia, USA; Teri Wang

Odom, Harvard University, Cambridge, Massachusetts, USA; and Paolo Samori, Humboldt University, Berlin, Germany. The five winners will each receive a cash prize of USD 1 000 and a free trip to the IUPAC Congress, 1–6 July 2001, Brisbane, Australia. Each prize winner will also present a poster at the IUPAC Congress describing his/her award-winning work.

The IUPAC Prize was initiated last year for the best Ph.D. thesis in the chemical sciences, as described in a 1 000-word essay. The essays describing the winners' theses can be found on the IUPAC web site (<http://>

www.iupac.org/news/prize/2001_winners.html) and cover a wide range of subject matter: Dr. Adhikari, "Radiation Chemical Studies on Biological and other Important Molecules in Micelles, Microemulsions, and Aqueous Solutions"; Dr. Coote, "The Origin of the Penultimate Unit Effect in Free-Radical Copolymerization"; Dr. Link, "Spectral Properties and Relaxation Dynamics of Surface Plasmon Electronic Oscillations in Gold and Silver Nanodots and Nanorods"; Dr. Odom, "Electronic Properties of Single-Walled Carbon Nanotubes"; and Dr. Samori, "Self-Assembly of Conjugated (Macro)molecules: Nanostructures for Molecular Electronics".

There were 29 applicants from 15 countries. The Prize Selection Committee comprised Members of the IUPAC Bureau with a wide range of expertise in chemistry. The Committee was chaired by Dr. Joshua Jortner, Professor of Chemistry at Tel Aviv University and Past President of IUPAC. Prof. Jortner commented on the high quality of the applications and said, "I was very happy with the nominations for the 2001 Prize, which reflect on the high quality of the international activity, and on the development of new and exciting research areas in the chemical sciences. In choosing the Prize winners, we considered scientific standards and quality as primary criteria, and geographical diversification as a secondary criterion".

In view of the quality of many applications, the Committee decided also to give four Honorable Mention awards to Volker P. W. Boehm, Technische Universität, München, Germany (currently at the University of North Carolina, Chapel Hill, North Carolina, USA); Erwin Kessels, Eindhoven University of Technology, Netherlands; Angelos Michaelides, The Queen's University of Belfast, Northern Ireland; and Janne Ruokolainen, Helsinki University of Technology, Finland (currently at the University of California at Santa Barbara, Santa Barbara, California, USA). The Honorable Mention Award winners will receive a cash prize of USD 100 and a copy of the *Compendium of Chemical Terminology*, the IUPAC "Gold Book".

The awards to the four winners of the IUPAC 2000 Prize and the five winners of the IUPAC 2001 Prize will be made during the Grand Opening session of the IUPAC Congress in Brisbane, Australia. Applications for the 2002 Prize are now being solicited, as described below.

Announcement of the 2002 Prize

The IUPAC Prize for Young Chemists has been established to encourage outstanding young research scientists at the beginning of their careers. The prize will be given for the most outstanding Ph.D. thesis in the general area of the chemical sciences, as described in a 1 000-word essay.

IUPAC will award up to four prizes annually. Each

prize will consist of USD 1 000 cash and travel expenses to the next IUPAC Congress. In keeping with IUPAC's status as a global organization, efforts will be made to assure fair geographic distribution of prizes.

Prizes will be presented biennially at the IUPAC Congress (next Congress: 10–15 August 2003, Ottawa, Canada). Each awardee will be invited to present a poster on his/her research and to participate in a plenary award session.

Applications must be submitted, as described below, to the IUPAC Secretariat. In addition, some IUPAC National Adhering Organizations are soliciting applications in their own countries, frequently in conjunction with a national award. In such cases, applications may be submitted to the NAO or to the Secretariat (not both). A list of participating countries is given on the IUPAC web site, <http://www.iupac.org/news/prize.html>.

Applications will be judged by a committee of eminent scientists appointed by the President of IUPAC.

Procedures for the 2002 Prize

- a. Entrants must have received their Ph.D. (or equivalent) degree, or completed all Ph.D. requirements including successful defense of the doctoral thesis, during calendar 2001 in any of the 60 countries that are Members or Associate Members of IUPAC. Entrants need not be citizens or residents of one of these countries at the time the application is submitted.
- b. The research described in the entrant's thesis must be in the field of the chemical sciences, defined as "chemistry and those disciplines and technologies that make significant use of chemistry."
- c. The IUPAC Prize recognizes only work that was performed while the entrant was a graduate student.
- d. Application requires submission of a completed entry form (available on the IUPAC web site at <http://www.iupac.org/news/prize.html>), together with the material listed in items e and f. The entry form and supporting material should be submitted by e-mail whenever feasible. Additional material may be sent as needed by fax or mail.
- e. An essay must be submitted by the entrant that describes his or her thesis work and places it in perspective relative to current research in the chemical sciences. The essay must be written in English by the entrant and may not exceed 1 000 words. (For applications submitted through NAOs, a national language may be permissible, and the NAO will assist in translation to English. The announcement by the appropriate NAO should be consulted.)
- f. Two supporting letters (sent by e-mail if feasible) are required from the thesis adviser and/or chairman of the thesis committee and one additional faculty member. These letters should comment on the qualifications and accomplishments of the applicant

and the significance of the thesis work.

- g. Complete applications must be received at the IUPAC Secretariat by 1 February 2002. If submitted through an IUPAC National Adhering Organization or Associate NAO, the deadline established by the NAO must be met. Early submission is

strongly encouraged so that any questions may be resolved before the deadline date.

Visit the IUPAC web site at <http://www.iupac.org/news/prize.html> for complete information and an application form.

Reports from IUPAC-Sponsored Symposia

38th International Symposium on Macromolecules (World Polymer Congress/MACRO 2000), 9–14 July 2000, Warsaw/Lódz, Poland

All scientific presentations associated with the Warsaw portion of this large conference took place in the beautiful 19th century main building of the Warsaw University of Technology. Delegates from 54 countries attended the meeting, which attracted 1 267 active participants, 17 plenary lectures, 84 section invited lectures, and a large number of contributed papers, both verbal and poster. Two of the plenary lectures were by Nobel laureates (Prof. Jean-Marie Lehn and Sir Harry Kroto), and another was a masterful overview of future directions in industrial research by Dr. Joe Miller, Research Vice President of DuPont. A special plenary lecture was reserved for a young scientist, and this honor was awarded by an international panel to Dr. Craig Hawker of the United States. There was also an excellent social program, which enabled delegates to exchange views in an informal atmosphere (including an International Youth Forum that the participating young scientists organized themselves, with some financial assistance from the IUPAC Macromolecular Division). The high scientific quality of the presentations, and the smoothness of the organization, more than amply justified IUPAC support by consistency with the goals of the Union, and warm congratulations are due to the Conference Chair, Prof. Stan Penczek, his deputy, Prof. Zbigniew Florjanczyk, and their large team.

Prof. Robert G. Gilbert
President, IUPAC Macromolecular Division IV
University of Sydney
New South Wales, Australia

9th International Symposium on Solubility Phenomena (9th ISSP), 25–28 July 2000, Hammamet, Tunisia

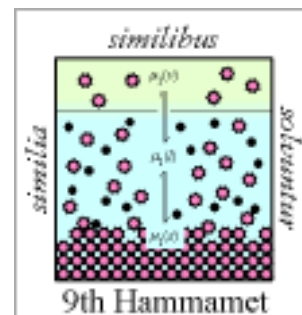
The seaside resort city of Hammamet, south of Tunis, was the site of the 9th International Symposium on Solubility Phenomena (ISSP). Welcoming banners in Ara-

bic and English greeted participants at the entrance of the Hotel Sol Azur, where excellent conference facilities were available. The symposium was cochaired by Dr. Najia Kbir-Arigoib (Institut National de Recherche Scientifique et Technique, INRST) and Prof. Radhouane Chtara (President, Société Chimique Tunisienne, SCT). Joint organizers were the IUPAC Commission on Solubility Data (V.8) and the SCT. The symposium also welcomed the sponsorship of IUPAC and the SCT. Support is further acknowledged from the Faculty of Science of Tunis, High School for Education and Recycling, and INRST.

Ninety-six participants from 22 countries (Austria, Belgium, Bulgaria, Canada, Czech Republic, Egypt, Finland, France, Germany, India, Ireland, Israel, Japan, Netherlands, Poland, Portugal, Russia, Saudi Arabia, Spain, Sweden, Tunisia, and the United States) took part. Of the scientific participants, 46 were from Tunisia and 50 from abroad. There were also 8 accompanying persons.

The opening ceremonies brought greetings from Prof. Chtara and Dr. Kbir-Arigoib (Symposium Co-chairs), Prof. David G. Shaw (Chairman of IUPAC Commission V.8), and Prof. John W. Lorimer (Official IUPAC Representative to the 9th ISSP).

Plenary lectures were given by Prof. H. A. J. Oonk (Netherlands), "Solid State Solubility and its Limits"; Prof. M.-Th. Cohen-Adad (France), "Phase Equilibria at Very High Temperatures: Influence of Pressure"; and Prof. J.-E. Dubois (France, President of CODATA), "New Data Access and Integration: Interdisciplinary Actions of CODATA". Six invited lectures were given by N. Kbir-Arigoib (Tunisia), "Extraction of Salts from the Tunisian Brines: Use of Solubility Diagrams"; J. Rumble (USA), "Reliable Solubility Data in the Age of Computerized Chemistry: Why, How, and When"; W. Voigt (Germany), "Solubility Equilibria in Multi-component Oceanic Salt Systems at $t = 0$ to 200 °C: Model Parametrization and Databases"; T. Ogawa (Japan), "Dissolution and Formation of Nuclear Materials



in Molten Media"; E. Königsberger (Austria), "Thermodynamic Modeling of Crystal Deposition in Humans"; and M. Gaune-Escard (France), "Dissolution of Spent Fuels in Molten Salts in Pyrochemical Treatment". In addition, there were 24 contributed papers and 33 posters.

The invited lectures, contributed papers, and posters covered the general areas of: solid-state solubility and molten salts; thermodynamics and kinetics in solution; biomineralization; fullerenes; nucleation phenomena; applications of coprecipitation phenomena and phase equilibria in separation technology and formulation of thin films; and compilation and evaluation of solubility data. Lectures and contributed papers were given in six sessions, and there was a very fine half-day poster session. The plenary and invited lectures will be published in *Pure and Applied Chemistry* under the editorship of Prof. Peter G. Fogg (UK).

Participants enjoyed an evening dinner reception hosted by the Société Chimique Tunisienne. A half-day excursion to the site of Carthage and its excellent museum, plus the picturesque seaside village of Sidi Bou Saïd, was followed by the symposium dinner, hosted by Dr. Kbir-Arighuib, in a restaurant in Carthage. Accompanying persons were well looked after, with excursions to the renowned Bardo Museum in Tunis and to the ancient cities of Kairouan, Sousse, and Monastir. The organizers are to be congratulated on a well-planned meeting that provided valuable new information on many aspects of solubility phenomena. The extensive participation of Tunisian chemists, along with a number of posters describing their current work, was a particularly notable feature of the symposium.

Prof. John W. Lorimer
Member, IUPAC Subcommittee on Solid Solubilities V.8.3
Department of Chemistry
University of Western Ontario
London, Ontario, Canada

12th International Congress on Thermal Analysis and Calorimetry, 14–18 August 2000, Copenhagen, Denmark

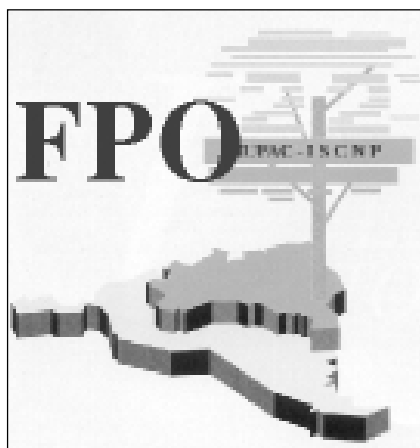
About 300 participants from 39 nations had the opportunity to attend 280 presentations (130 lectures and 150 posters) at this meeting. Lectures and posters were generally of a high standard. Organization and information distributed before and during the conference were excellent. In my brief talk at the opening of the Congress, I conveyed the traditional greetings from IUPAC, with good wishes for a successful conference. Although there was not time for any significant presentation of IUPAC programs and policies, I delivered a substantial mes-

sage from IUPAC's Commission on Thermodynamics (I.2), with wishes for closer cooperation between Commission I.2 and the International Congress on Thermal Analysis and Calorimetry (ICTAC), in particular regarding nomenclature and terminology. I also presented a letter on that subject, from Commission I.2 Chairman Prof. Ron D. Weir to outgoing ICTAC President Edward Charsley. The letter was later discussed at the ICTAC business meeting, and our proposal was received very favorably.

Prof. Ingemar Wadsö
National Representative, IUPAC Commission on Thermodynamics I.2
Termokemi, Kemicentrum
Lunds Universitet
Lund, Sweden

22nd IUPAC International Symposium on the Chemistry of Natural Products (ISCNP-22), 4–8 September 2000, São Carlos, São Paulo, Brazil

Research on the chemistry of natural products has a long tradition. The topic can be regarded as the basis of modern organic and biomolecular chemistry. It is not surprising that IUPAC, at an early stage of its activities, initiated the present series of biennial symposia, which now has been going on for nearly half a century.



Organic natural products have been a major source of inspiration not only for present activities in organic chemistry, but also for activities in related fields of life sciences. Today we experience exciting development of molecular understanding of functions of natural organic compounds in life processes, and we can enjoy and be fascinated by the enormous diversity that nature offers.

The development of methods for synthesis, separa-

tion techniques, and structural studies, has provided tools for studies of natural products. These studies offer a deeper understanding of the chemistry of life processes and of complex biological and ecological interactions in nature.

The recent ISCNP-22 symposium in Brazil clearly demonstrated the importance of interdisciplinary research efforts in the field. It gave an overview and provided excellent opportunities for exchange of information and for starting collaborative research efforts. Scientific quality of the presentations was high, and the scientific program provided an outlook on several research frontiers from synthesis and biosynthesis to mode of action. During the 5 symposium days, 8 plenary lectures, 19 invited lectures, and 33 short lectures were presented. Each morning there were poster sessions; more than 300 posters were presented in all. Particularly impressive were the contributions from the many young, mainly Brazilian, scientists. Enthusiasm and interest for research and development in the field, demonstrated by the Brazilian scientists, were significant and strongly indicate future successful activities of high international quality. Prof. Dr. Otto R. Gottlieb, who was chairman of the symposium organizing committee, can be very proud, because he is the mentor for many of the natural product chemists of Brazil.

The initiative of having this symposium in a developing country and, in particular, in a biodiversity-rich country such as Brazil, was very much appreciated. The symposium will not only have an impact for the future development of this field of research in Brazil, but will also provide a platform for activities in other biodiversity-rich countries. The organizers—and, in particular, Prof. Dr. M. Fátima das G. F. da Silva, who was the Secretary General—are to be congratulated for a successful symposium.

Prof. Torbjörn Norin
President, IUPAC Organic and Biomolecular
Chemistry Division III
Royal Institute of Technology
Stockholm, Sweden

16th International Symposium on
Medicinal Chemistry, 18–22 September
2000, Bologna, Italy

It is the third time that this symposium was held in Italy (previously, it was held in Florence in 1974 and in Milan in 1978), but the Bologna location shed a unique light on the meeting. Bologna is the site of the oldest university in the world, as the University of Bologna was established almost a millennium ago in 1088. This noble locale demanded an outstanding effort of the Organizing Committee, chaired by Prof. C. Melchiorre (Uni-

versity of Bologna) to achieve a high standard for the scientific program. The symposium's objectives were fully achieved, and 1 200 participants enjoyed a unique four-day event, merging scientific, cultural, and historical interests with world-famous Bolognese cuisine and well-known hospitality, along with the open-minded and fun-loving personality of the people of Bologna.

The opening ceremony was initiated by Prof. Melchiorre, who introduced the symposium program to the audience, followed by representatives of IUPAC, the Medicinal Chemistry Division of the American Chemistry Society, the Asian Federation of Medicinal Chemistry, the European Federation of Medicinal Chemistry, and the Medicinal Chemistry Division of the Italian Chemical Society. All of these speakers further stressed the scientific and cultural attributes of the venue.

The prestigious Nauta Award for Medicinal Chemistry was given to Prof. E. De Clercq (Rega Institute for Medical Research, Katholieke Universiteit Leuven) for his outstanding work in antiviral research. Special mention is due De Clercq's work in the HIV area, which he outlined in a plenary lecture. He reviewed all the potential mechanisms by which HIV could be targeted to provide new and effective therapies. For example, the replication of the virus could be stopped by reducing viral absorption to the cell by blocking it with polyanionic compounds containing the viral envelope glycoprotein, gp 120, which is instrumental to the adhesion process. Additional targets are the virus-cell fusion processes, blocked by certain oligopeptides, and viral assembly that could be prevented by dithiobisbenzamido derivatives. The importance of these newer approaches is further increased by the continuous appearance of HIV strains that are resistant to the current therapy.

The inaugural lecture on rational drug design was given by Prof. Daniel H. Rich (Department of Chemistry and School of Pharmacy, University of Wisconsin, Madison, Wisconsin, USA). What will it look like at the end of the 21st century? After a historical overview on the progress made by medicinal chemists in the design and synthesis of new drugs, from the Erlich concept of the magic bullet to the use of computerized approaches, Prof. Rich suggested that the main limitation of effective drug design is our poor knowledge of the real conformations of protein receptors and enzymes. More powerful tools, such as understanding how certain natural toxins can easily cross barriers (i.e., the blood-brain barrier) will be available during the new century to help medicinal chemists overcome these issues.

Prof. P. Krosgaard-Larsen (Royal Danish School of Pharmacy, Copenhagen, Denmark) delivered a plenary lecture on inhibitory and excitatory amino acid agonists and antagonists and their potential application

in the treatment of neurological disorders. Although the application of molecular biology to receptor classification has increased the number of receptor subtypes, chemical manipulation of prototype molecules has already produced a number of selective ligands that are able to interact with single subtypes. It is hoped that this development will result in more specific action of drugs that will eventually emerge from clinical trials.

Technology innovation is of paramount importance in current drug discovery process, as Dr. D. Trist (Glaxo Wellcome, Verona, Italy) outlined in his lecture. New technology, such as combinatorial chemistry and ultra-fast screening, have revolutionized the pace of new lead discovery, while the availability of genetic information from the human genome project will allow researchers to associate diseases with targets and validate them quickly. Lead compounds could be effectively optimized in terms of their physicochemical, pharmacokinetic, and toxicological properties, and then tested in humans to confirm their biological profile (proof of concept). In this way, the best molecules can be selected in the early phase of the discovery process, thereby greatly increasing the probability of success in the development phase.

Main lectures and posters sessions were organized around the following subjects:

- antihypertensive agents
- impact of organic chemistry on drug discovery
- antiinfective agents
- hypolipidemics/antiatherosclerotics
- anticancer agents
- new paradigm in receptorology
- natural products
- antiviral agents
- ligands for P1 and P2 receptors
- neurodegenerative diseases
- ligands for glutamate and GABA receptors
- pain and inflammation

Presentations and posters were characterized by a high standard, with careful, detailed descriptions of the subjects treated. They sparked many stimulating scientific discussions.

Lastly, both the gala dinner and the concert represented wonderful highlights for this very successful symposium. The dinner took place at Villa Cicogna, a summer residence for Italian princes; it was built in 1570 by the renowned architect Jacopo Barozzi. More than 400 attendees at the dinner tasted the fantastic Bolognese food while viewing the magnificent frescoes.



Organizing committee of the 1st International IUPAC Symposium on Trace Elements in Food, left to right: Prof. Maciej Jarosz, Warsaw University of Technology; Prod. Ewa Bulska, Warsaw University of Technology; Prof. Barbara Szteke, Institute of Agricultural and Food Biotechnology; Dr. Renata Jedrzejczak, Institute of Agricultural and Food Biotechnology; and Prod. Adam Hulanicki, Warsaw University.

The concert was held in the Gothic Basilica of Santa Maria dei Servi, where about 800 attendees were entertained with a selection of classic pieces from Bach and Vivaldi to Verdi, all performed by a fine orchestra and choir.

Dr. Giovanni Gaviraghi
National Representative, IUPAC Medicinal Chemistry Section Committee VII.M
Glaxo Wellcome S.p.A.
Medicines Research Center
Verona, Italy

1st International IUPAC Symposium on Trace Elements in Food,
9–11 October 2000, Warsaw, Poland

This first Symposium on Trace Elements in Food was initiated by the IUPAC Commission on Food (VI.5) and organized by the Polish Academy of Sciences, the Warsaw University of Technology, the Polish Food Technologist's Society, and the Institute of Agriculture and Food Biotechnology. The Symposium, whose Organizing Committee was chaired by Prof. Barbara Szteke, attracted 128 participants from 27 countries.

The program featured 16 plenary and invited papers, which were supplemented by an additional 10 selected oral presentations. There were also 52 posters, with an accompanying small scientific manufacturers exhibition. The truly interdisciplinary nature of the symposium can be seen from the program, which covered sources and translocation of trace elements in the trophic

chain; trace elements in food (occurrence and function); interaction of trace elements with other compounds (toxicological and nutritional aspects); trace element speciation in food and its implications for human health; advances in methods for analyzing trace elements in food matrices; and quality assurance and reference materials for the analysis of trace elements in food. Of particular note among the presentations were those that provided an insight into areas of future development, for example, tackling the question of how far we are today and where we are going with international legislation on trace elements as contaminants in food. The extent to which the uptake of Cu, Se, Zn, Ni, Mo, and Cr fulfils dietary needs was assessed with respect to the Austrian diet. The use of stable isotopes to determine bioavailability of trace elements was assessed, as was speciation of trace elements in terms of what we presently know and what we need to know for the future. Finally, the important area of measurement in food

was discussed from a metrology viewpoint, as was the question of traceability in food measurements.

The proceedings of the symposium, edited by Prof. Szteke and including the oral contributions, will be published before the end of 2001 as a Special Issue of *Food Additives and Contaminants*.

The Commission on Food (VI.5) will be disbanded by the time of the next symposium, owing to the upcoming restructuring of IUPAC. It is hoped, however, that the success of this first symposium will lead to a second symposium, which probably will be hosted by the Institute for Reference Materials and Measurements (IRMM) in Geel, Belgium in 2003.

Prof. John Gilbert
Chairman, IUPAC Commission on Food (VI.5)
Ministry of Agriculture, Fisheries, and Food
Central Science Laboratory
Sand Hutton, York, England, UK

New Projects

Visit <http://www.iupac.org/projects/> for complete information and further links.

IUPAC Chemical Identifier (IChI)

IUPAC has approved a project to establish a unique label, the IUPAC Chemical Identifier (IChI), as a non-proprietary identifier for chemical substances that could be used in printed and electronic data sources, thus enabling easier linking of diverse data and information compilations.

IChI will not require the establishment of a registry system. Unlike the CAS Registry System, it will not depend on the existence of a database of unique substance records to establish the next number for any new chemical substance being assigned an IChI. It will use a yet-to-be-defined set of IUPAC structure conventions, and rules for normalization and canonicalization of the structure representation to establish the unique label. It will thereby enable an automatic conversion of a graphical representation of a chemical substance into the unique IChI label, which can be performed anywhere in the world and which could be built into desktop chemical structure drawing packages (such as ChemDraw, ISIS/Draw, etc.) and online chemical structure drawing applets (such as ACD/Draw).

IUPAC would define the process flow leading from input of structural information to the creation of the Identifier in three steps: definition of chemical structure input requirements, algorithms for generating a unique set of atom labels (canonicalization), and algorithms for conversion of these labels into the Identifier (serialization). Structure input and conversion to the structural format required by the IChI generator would

be carried out with vendor-developed software.

The process would be reversible, so that the Identifier output could be used to regenerate structural input information. The Identifier would thus serve as the computer equivalent of the IUPAC name for a molecule. This arrangement would facilitate searching the Internet and labeling information in electronic documents with the name of the chemical substance in question.

A prototype algorithm with limited applicability is expected to be available for testing toward the end of 2001.

Comments from the chemistry community are welcome and should be addressed to the project coordinator, Dr. Alan McNaught, General Manager, Production Division, RSC Publishing, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge CB4 0WF, England, UK, Tel.: +44 1223 432119, Fax: +44 1223 420247; E-mail: adm@rsc.org.

See <http://www.iupac.org/projects/2000/2000-025-1-050.html> for project description and update.

Immunochemistry of Metal Sensitization

A number of metals are immunological sensitizers in humans. Examples include occupational exposures to Ni, Co, and Cr; inhalation of Pt compounds and the possibility of sensitization to chloroplatinic catalysts in silicone implants; beryllium-related lung disease; and exposure to components of alloys used in joint replacements and skeletal stabilization. In general, activation of the immune system occurs when the metal ion (hap-

ten) binds to an endogenous protein carrier, altering its structure and causing it to become antigenic. T-cells may recognize metal-modified peptides or the T-cell's MHC class II-peptide complex may itself be modified by a metal ion. The nature of the metal hapten-carrier complex has not been systematically reviewed for metals that are important occupational or iatrogenic immunosensitizers. New immunological methods are being developed for clinical evaluation of immune sensitization by a number of occupationally and iatrogenically important metals.

IUPAC has approved a two-year project to evaluate and systematize the application of these methods, and to produce a critical examination of the molecular structural foundations of the sensitizing response.

Comments from the chemistry community are welcome and should be addressed to the task group chairman, Prof. Douglas M. Templeton, Department of Lab Medicine and Pathobiology, University of Toronto, Medical Sciences Building, Room 6302, 1 Kings College Circle, Toronto, Ontario M5S 1A8, Canada; Tel.: +1 416 978 3972; Fax: +1 416 978 5959; E-mail: doug.templeton@utoronto.ca.

See <http://www.iupac.org/projects/1999/1999-047-1-700.html> for project description and update.

Critically Evaluated Termination Rate Coefficients for Free-Radical Polymerization. 1. Current Status, Evaluation of Experimental Methods, Data for Styrene and Methyl Methacrylate

Free-radical polymerization (FRP) has always been a scientifically and commercially important field. This importance is set to increase even further owing to recent advances such as the development of "controlled radical polymerization". Hence, it is of great benefit for both science and industry to be able to model the kinetics of FRP systems. Such modeling is dependent on the availability of reliable values of rate coefficients, but attaining such values is not as straightforward as one might suppose. An IUPAC Working Party on Modeling of Polymerization Kinetics and Processes has outlined the reasons for this situation [1,2] and has begun to rectify it with regard to propagation rate coefficients [3-5]. Now this process will be started for termination rate coefficients, k_t .

This collaborative project, supported by IUPAC's Macromolecular Division (IV), brings together experts in the field in order to fulfill the following goals:

- To make workers aware of the subtleties involved in studying and describing the termination reaction;

- To carry out an evaluation of methods for determining k_t , arriving at agreement regarding the strengths and weaknesses of each method; and
- To come up with critically evaluated k_t values for the initial stages of bulk polymerization of styrene and methyl methacrylate, two otherwise well-characterized systems.

This project is being chaired by Dr. Greg Russell, who may be contacted at: Department of Chemistry, University of Canterbury, Private Bag 4800, Christchurch, New Zealand; Tel.: +64 3 364 2458; Fax: +64 3 364 2110; E-mail g.russell@chem.canterbury.ac.nz. Comments and suggestions will be welcomed. See <http://www.iupac.org/projects/2000/2000-028-1-400.html> for project description and update.

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2. M. Buback, R. G. Gilbert, G. T. Russell, D. J. T. Hill, G. Moad, K. F. O'Driscoll, J. Shen, M. A. Winnik. *J. Polym. Sci., Polym. Chem. Ed.* **30**, 851 (1992).
3. M. Buback, R. G. Gilbert, R. A. Hutchinson, B. Klumperman, F.-D. Kuchta, B. G. Manders, K. F. O'Driscoll, G. T. Russell, J. Schweer. *Macromol. Chem. Phys.* **196**, 3267 (1995).
4. S. Beuermann, M. Buback, T. P. Davis, R. G. Gilbert, R. A. Hutchinson, O. F. Olaj, G. T. Russell, J. Schweer, A. M. van Herk. *Macromol. Chem. Phys.* **198**, 1545 (1997).
5. S. Beuermann, M. Buback, T. P. Davis, R. G. Gilbert, R. A. Hutchinson, A. Kajiwara, B. Klumperman, G. T. Russell. *Macromol. Chem. Phys.* **201**, 1355 (2000).

Metabolism Terms

IUPAC has approved a new project to list and define terms pertinent to the area of drug metabolism. The resulting list will be disseminated to the scientific community via publication in relevant journals. This process will help achieve a common definition base across the various publications and databases pertaining to the drug metabolism field, particularly with regard to the latter's impact upon chemical structure.

Comments from the medicinal chemistry and drug metabolism communities are welcome and should be addressed to the project chairperson, Prof. Paul Erhardt, Center for Drug Design and Development, The University of Toledo College of Pharmacy, Toledo, Ohio 43606-3390, USA; Tel: +1 419 530 2167; Fax: +1 419 530 1994; E-mail: perhard@utnet.utoledo.edu.

See <http://www.iupac.org/projects/2000/2000-009-1-700.html> for project description and update.

Human Drug Metabolism Database

IUPAC has approved a new project to construct a human drug metabolism database model. The model will be mounted on the Internet for use by the scientific community without charge. As the model is further elaborated and data are accumulated, the database will eventually serve as a standard for how various chemi-

cal arrangements have been metabolized in humans.

Comments from the medicinal chemistry and drug metabolism communities are welcome and should be addressed to the project chairperson, Prof. Paul Erhardt (see contact information immediately above).

See <http://www.iupac.org/projects/2000/2000-010-1-700.html> for project description and update.

Provisional Recommendations

IUPAC Seeks Your Comments

In this section, we publish synopses of IUPAC's latest provisional recommendations on nomenclature and symbols. All comments on these recommendations are welcome and will be taken into consideration. The final revised versions are published in *Pure and Applied Chemistry (PAC)*.

If you would like to comment on the provisional recommendations, please visit the IUPAC web site at <http://www.iupac.org/reports/provisional/index.html>, where the full texts are available for downloading as draft pdf files. Alternatively, you can write to your nearest national/regional center to request a copy; the most recent list of national/regional centers is available on the web site at the address above and last appeared in *CI*, Vol. 17, p. 141 (1997).

Analytical Chemistry Division. Commission on General Aspects of Analytical Chemistry—Selectivity in Analytical Chemistry

<http://www.iupac.org/reports/provisional/abstract01/vessman_300901.html>

The correct use of the term selectivity and its clear distinction from the term specificity is discussed. Recommendations are made with regard to (a) the definition of selectivity and (b) that the use of the term selectivity be promoted.

Comments by 30 September 2001 to Dr. Jörgen Vessman, Astra Zeneca R&D Mölndal, S-43183 Mölndal, Sweden. Tel.: +46-31-776-1321, Fax: +46-31-776-3773, E-mail: jorgen.vessman@astrazeneca.com.

New Books and Publications

New Book from Wiley-VCH and Verlag Helvetica Chimica Acta

***Color: A Multidisciplinary Approach.* Heinrich Zollinger. Wiley-VCH, Weinheim, Germany and Verlag Helvetica Chimica Acta, Zürich, Switzerland. Hardcover, 1999, x + pp. 1–258. ISBN 3-906390-18-7, USD 120.00, GBP 59.50, DM 198, CHF 176.**

Contents

Preface; Contents; Introduction: What do We Mean by Color?/Historical Survey; Physics of Light and Color: The Nature (Theory) of Light/Color by Refraction: Newton's Experiments/Color of the Rainbow/Peacock's Colors, a Phenomenon of Interference/How Many Causes of Color Do We Know?; Chemistry of Color: History of Colorants/Inorganic Pigments/Or-

ganic Colorants/Correlations between Chemical Structure and Color of Chemical Compounds; Colorimetry: Color Measurements/Color—Harmony or Contrasts?; How Do We See Colors: Perception and Cognition of Color/Anatomy of the Human Eye/Photochemistry of the Retina/What Does the Eye Tell the Brain?/Psychophysical Investigations on Color Vision/Color Vision of Animals; How Do We Name Colors?: From Color Chemistry to Color Linguistics/The Phenomenon (Prodigy) of Human Language/Categorization of the Color Space by Color Naming/Color and Phonological Universals/Cultural Influence on Color Naming; Color in Art and in Other Cultural Activities: Color in European Art from Antiquity to Gothic/From Renaissance to Neo-Impressionism/Art in the 20th Century/Color in the Art of Non-European Culture: The Case of Japan/Color in Psychology/Goethe's "Farbenlehre"/Sound-Color Synesthesia; Epilogue; Acknowledgments; Author Index; Subject Index

This book by Heinrich Zollinger, an emeritus professor at the Swiss Federal Institute of Technology in Zurich and past President and current Affiliate Member of IUPAC, is sure to interest many readers of *CI*. After all, as stated on the Wiley-VCH web site, “Who is not attracted, fascinated, or even amazed by the world of colors?” Prof. Zollinger spent his long career specializing in color and textile chemistry, and he has had a lifelong love affair with the spectrum between red and violet. He writes in a very accessible manner that will appeal to chemists, physicists, neuroscientists, psychologists, ophthalmologists, interior designers, painters, and visual artists of all types. Thomas Lazar, a professor in the Department of Molecular Genetics, Max Planck Institute for Biophysical Chemistry, Göttingen, Germany, writes in his review in *Science* (Vol. 288, p. 1351, 26 May 2000) that the text is “accompanied by informative graphics and many high-quality reproductions of photographs and paintings”. Prof. Zollinger also discusses the role of linguistics in designating special terms to describe colors and colorfulness. As Prof. Lazar states in his review, “Zollinger’s account is itself a kaleidoscope of color. The chapters proceed in a logical order from the physics of light and the chemistry of colorants, through the biology of vision, to the culture of visual arts. Each, however, can be read independently, which makes it easy to dive into the next, wherever one is lured. After exploring Zollinger’s varied perspectives, readers will look at the colorful world around them with increased awareness and appreciation”.

New Book from Elsevier

***Catalytic Polymerization of Cycloolefins. Ionic, Ziegler–Natta, and Ring-Opening Metathesis Polymerization.* V. Dragutan (Institute of Organic Chemistry of the Romanian Academy, 202B Spl. Independentei, 71141 Bucharest, Romania) and R. Streck (Hüls AG, Marl, Germany; retired). Series on Studies in Surface Science and Catalysis, 131. Elsevier, Amsterdam, Netherlands (<http://www.elsevier.nl>). Hardcover, 2000, 1292 pages. ISBN 0-444-89519-1, NLG 775.00, USD 406.00.**

This book covers the most important topics concerning cationic Ziegler–Natta and ring-opening metathesis polymerization of cycloolefins. The work describes the major pathways that cycloolefins can follow under the action of specific catalytic systems—essentially vinyl and ring-opening polymerization, both reaction types allowing the manufacture of distinct products with wide applicability in modern technologies. Comprehensive data available on this subject are logically and systematically selected and reviewed throughout 18 chapters, according to the basic catalytic processes involved,

types of monomers and catalysts employed, reaction conditions, and application fields. Modern trends in design of chiral metallocene catalysts, well-defined living metathesis catalysts, and catalysts tolerant toward functionalities and water systems are highlighted.

Dragutan and Streck discuss in detail relevant aspects of the processes outlined above, including reaction thermodynamics, kinetics, mechanisms, and stereochemistry, and they correlate the structure of manufactured polymers with their chemical and physical–mechanical properties. Related important topics include Ziegler–Natta polymerization of olefins and dienes, atom transfer radical polymerization of vinyl compounds, metathesis of olefins and acetylenes, acyclic diene metathesis reactions, carbonyl olefination reactions, metathesis polymerization of acetylenes, metathesis degradation of polymers, and ring-opening polymerization of heterocycles. Special emphasis is placed on manufacture of commercial products, new polymers and copolymers of potential interest for industry, and design and synthesis of specialty polymers with particular structures, architectures, and desired properties.

The book critically evaluates the most recent achievements reported in the field and outlines modern trends in research and application of catalytic processes for cycloolefin polymerization. For the first time, comprehensive information about the published data on the subject up to now is provided for both academic and industrial researchers working in the areas of polymer chemistry, organic and organometallic chemistry, surface science and catalysis, petrochemistry, and chemical engineering. The content of this volume will also be of interest to other scientists and advanced students and industrialists working in chemistry, as well as in areas such as computer technology, telecommunications, microelectronics, fine mechanics, optics, medicine, construction, transportation, and agriculture.

This stimulating book offers an enlightening introduction and quick documentation on the subject, as well as a solid, in-depth background in the field. Moreover, the volume contains a wealth of useful information for specialists applying polymers in various scientific and industrial areas, such as computer technology, telecommunications, microelectronics, fine mechanics, optics, medicine, construction, transportation, sports, and agriculture.

Reports from Commissions and Division Committees

Commission on Food—VI.5

Summary of Minutes of Commission Meeting at Warsaw, Poland, 7 October 2000

The outcomes of the meeting of the Division of Chemistry and the Environment held in Tel Aviv, Israel, 4–6 June 2000 were discussed, in particular in relation to the impact on future activities in food chemistry.

Working Group Activities

Fats, Oils, and Derivatives

- “Lexicon for lipid nutrition” (Project No. 660/42/90): to be published by IUPAC in PAC in 2001
- “Replacement of toxic chemicals in IUPAC standard methods” (Project No. 660/47/93)
- “Determination of phosphorus in edible oils by spectrophotometry” (Project No. 660/48/93): to be completed shortly and published in the 8th edition of *Standard Methods for the Analysis of Oils, Fats, and Derivatives* (see below)
- “Determination of oxidized triacylglycerols” (Project No. 660/51/93): completed and published in *PAC* (Vol. 72, No. 8, pp. 1563–1575, 2000)
- Fats, Oils, and Oilseeds Analysis Workshop: held 21–22 November 2000 in Rio de Janeiro, Brazil
- 8th edition of *Standard Methods for the Analysis of Oils, Fats, and Derivatives*: The 7th edition will be corrected and prepared for publication.
- Validation of Inductively Coupled Plasma (ICP) Methods for Metals in Oils, Especially Heavy Metals (Cd, Ni, Pb, Hg, and Al): to be completed in collaboration with the American Oil Chemists Society (AOCS)
- Development of training courses in lipids: to be carried out in collaboration with AOCS

Food Chemistry

Mycotoxins

- IUPAC Electronic Bulletin Board for Mycotoxins (Project No. 650/85/95): recommended to be continued
- The 10th International IUPAC Symposium on Mycotoxins and Phycotoxins (Project No. 650/91/97) was held 21–25 May 2000 in Guarujá, Brazil (see report in *CI*, Vol. 22, No. 5, p. 140). Proceedings of this symposium are to be published as a book.
- “Collaborative study of the determination of aflatoxin M₁ in milk combining immunoaffinity cleanup and thin layer chromatography”: coordinated with

the International Atomic Energy Agency (IAEA) and the International Dairy Federation (IDF) and scheduled to be completed within the next six months

- “Identification of major sources of ochratoxin A (OA) intake through the analysis of OA in human serum”: scheduled to be completed by July 2001
- “Mycotoxin methods for developing countries” (Project No. 1999-010-1-600): scheduled to be completed by November 2001
- The 11th International Symposium on Mycotoxins and Phycotoxins: planned to be held in 2003 in College Park, Maryland, USA

Halogenated Hydrocarbons

- “Collaborative study on novel and conventional extraction procedures for the determination of toxicologically relevant PCBG congeners in fish” (Project No. 650/90/97)

Aquatic Biotoxins

- Aquatic biotoxin nomenclature: A new project for the development of a report on aquatic biotoxin nomenclature was proposed.

General Discussion

In discussion of how the activities of the Commission could continue after the Commissions are dissolved in 2001, it was agreed that it was unlikely that projects would be submitted to IUPAC without being solicited and that there is minimal mutual interest in foods-related projects in the Division of Chemistry and the Environment (VI). The Commission concluded that IUPAC would most likely lose a significant opportunity to play an important role in this area, given the increasing recognition of the importance of food safety and food composition by the World Health Organization, Codex, and other international organizations.

Samuel W. Page

Secretary, IUPAC Commission on Food VI.5

Conference Announcements



designates IUPAC sponsorship

8th International Conference on Chemistry in Africa (8th ICCA): Chemistry and Quality of Life, 30 July–4 August 2001, Dakar, Sénégal



Major topics to be tackled by this conference include the following:

- chemistry and infectious diseases
- making medicines using plants
- how to set up an international harmonization policy of chemical protocols and analysis methods in the domain of the quality of waters
- chemistry and agriculture
- chemistry and the environment
- chemistry and new materials
- teaching of chemistry

Approximately 200 scientific participants from around the world are expected to attend this conference.

For additional information, contact Prof. Abdoulaye Samb, Department of Chemistry, Faculty of Sciences and Technology, University Cheikh Anta Diop Dakar, BP 5005 Dakar-Fann, Sénégal; E-mail: sambab@ucad.sn; Tel.: +221 864 13 33; Fax: +221 824 63 18; Web site: <http://www.cica.ucad.sn>.

10th International Conference on Bioinorganic Chemistry (ICBIC 10), 26–31 August 2001, Florence, Italy

This symposium will focus on the theme "Metallobiochemistry in the Post-Genomic Era". Scientific sessions will cover model chemistry, metalloproteins and metalloenzymes, DNA/RNA/nucleotides and metals, radicals and life, signal transduction, from the gene to ion uptake and release, metal-based drugs, physical methods, and environmental biotechnology.

For further information, contact ICBIC 10 Secretariat, Centro di Risonanze Magnetiche (CERM), University of Florence, Via Luigi Sacconi, 6, 50019 Sesto Fiorentino (FI), Italy; E-mail: icbic10@cerm.unifi.it; Tel.: +39 55 4209261/260; Fax: +39 55 4209253; Web site: <http://www.cerm.unifi.it/icbic/icbic10.html>.

IUPAC Workshop on Green Chemistry Education, 12–14 September 2001, Venice, Italy

The IUPAC Division of Organic and Biomolecular Chemistry (III) has recently constituted the Committee on Green Chemistry. The aim of this committee is to develop actions devoted to the cause of green chemistry for its wider benefit to the future of chemistry and society as a whole. The first formal activity of the Committee on Green Chemistry will be to conduct this Workshop on Green Chemistry Education, which is to be held in Venice during the Summer School on Green Chemistry (see <http://helios.unive.it/inca/formazione/summer/index4.html>).

The workshop is being organized in collaboration with the Interuniversity Consortium "Chimica per l'Ambiente" (INCA). Experts from academia and industry, national chemical societies, industrial organizations, government, environmental groups, and the media will be involved in the workshop. Representatives from countries of the Organization for Economic Cooperation and Development (OECD) and from the OECD Issue Team on Sustainable Chemistry will be invited to participate, and results of the workshop will be provided to the OECD Program on Sustainable Chemistry.

For further information, contact Prof. Pietro Tundo, Department of Environmental Sciences, University Ca' Foscari of Venice, Dorsoduro 2137, 30123 Venice, Italy; E-mail: tundop@unive.it; Tel.: +39 041 2578642; Fax: +39 041 2578620; Web site: <http://www.unive.it/inca>.

International Conference on Bioinformatics 2002: North–South Networking, 6–8 February 2002, Bangkok, Thailand



This conference will provide a forum for bioinformatics scientists from around the world to present their work, to obtain advanced information from experts, and to learn about research models for several developing countries. Networking for research cooperation between scientists of various disciplines, such as biology, computer science, physics, and mathematics, will also be established. Specific objectives of the conference are as follows:

- to stimulate contact and interactions between people

- who have interests and activities in the field of bioinformatics
- to exchange scientific knowledge among researchers internationally
 - to facilitate cooperation and networking among scientists in both developed and developing countries

Bioinformatics is of growing importance to the world as a tool of life science research. It incorporates and integrates several scientific disciplines together—namely, biological sciences, biochemistry, biophysics, and computational sciences—to create “a book of life”. In contrast to scientific work in many other disciplines, bioinformatics research can usually be carried out just by using a high-end personal computer and a good Internet connection without any other major equipment or expensive chemicals. Its success is, therefore, not necessarily limited to the developed world. A group of bioinformatics scientists who have a deep understanding of the scientific discipline related to information theory and biology can be successful anywhere in the world. Bioinformatics is also important in enhancing the capability of biologists in the developing world to design experiments competently and interpret the data obtained effectively so that they can apply their work to solve the problems of developing countries, which may not attract the interest of scientists in the developed world.

The three-day conference program will consist of plenary lectures in the morning and parallel sessions (three per day), a poster exhibition, and minisymposia in the afternoon. In addition, there will be at least one preconference workshop. Topics to be addressed during the conference include application of information theory in biology; evolutionary biology; phylogenetics; data mining and knowledge discovery in molecular databases; open sources bioinformatics; high-performance computing for computational biology; human genome variation; protein structure prediction; genome, pathway, and interaction bioinformatics; bioinformatics for biodiversity; bioinformatics for drug design; bioinformatics and control of infectious diseases; bioinformatics for agricultural research; computer modeling in physiology; and strengthening bioinformatics capability of developing countries.

Approximately 500 scientific participants from around the world are expected to attend this conference.

For further information, contact Mr. Prasit Palittapongarnpim, M.D., Deputy Director, BIOTEC, 15th Floor, Gypsum Metropolitan Tower, 539/2 Sri-Ayudhya Road, Ratchadevi, Bangkok, Thailand; E-mail: prasit@biotec.or.th; Tel.: +66 2 6425322 31, Ext. 228; Fax: +66 2 2488304; Web site: <http://incob.biotec.or.th>.



5th Conference on Solid-State Chemistry, 7–12 July 2002, Bratislava, Slovakia

This conference will cover up-to-date topics of modern solid-state chemistry in subsections on advanced synthesis and characterization techniques, structure and electron structure, electrochemistry and solid-state superionics, chemistry of glasses, novel inorganic materials, layered compounds, clathrates and intercalates, and deposited films and surface chemistry. Invited speakers (already agreed) will highlight both the interdisciplinary aspects of solid-state science and the latest achievements of chemists in areas of special significance. It is expected that the meeting will spark a lively and sensitive exchange of knowledge among members of the worldwide chemistry community and thus promote the vital area of solid state chemistry.

Plenary and invited section lectures will address crystal and electron structure of solids; glass chemistry; hydrothermally treated cement-based building materials; polymer-derived nonoxide ceramics; chemistry, local structures, and the tailoring of properties of novel inorganic materials; chemical modification of negative charge in the structure of layered silicates; magnetic and optic phenomena of solids; thick films in materials chemistry; new developments in the chemistry of high T_c superconductors; environmental scanning electron microscopy; *ab initio* molecular-dynamic studies of proton dynamics in zeolites and clays; and better ceramics through chemistry.

Approximately 250 scientific participants from around the world are expected to attend SSC 2002.

For further information, contact Prof. Dr. P. Šajgalik, Institute of Inorganic Chemistry, Slovak Academy of Sciences, Dubravska c., Bratislava, SK-842 36 Slovakia; E-mail: uachsajg@savba.sk; Tel.: +421 7 594 10400; Fax: +421 7 59410444.

21st International Carbohydrate Symposium, 7–12 July 2002, Cairns, Australia



This symposium will address all aspects of glycoscience, that is, the chemistry, biochemistry, biology, and biotechnology of carbohydrates. The program will include the Whistler Award Lecture, plenary and session lectures, and poster presentations; where possible, oral presentations by young scientists will be encouraged. One session will be set aside for doctoral students to discuss their research with plenary or session lecturers.

For further information, contact The Secretariat, 21st International Carbohydrate Symposium, Congress West, 12 Thelma Street, P. O. Box 1248, West Perth, Western Australia 6872; E-mail: conwes@congresswest.com.au; Tel.: +61 8 9322 6906; Fax: +61 8 9322 1734; Web site: www.ics2002.uwa.edu.au.

19th IUPAC Symposium on Photochemistry, 14–19 July 2002, Budapest, Hungary



This symposium, continuing in the tradition of previous conferences in the series, will serve as a forum to assess the “state of the art” of international photochemistry as well as new developments and future trends in the field. Photochemists from 30 or more countries will have an opportunity to meet in formal and less formal settings, exchange ideas, gauge the progress of ongoing international collaborations, and explore the possibility of new collaborations.

Plenary lectures will cover generation and reactions of reactive intermediates in cryogenic matrices, laser-induced optoacoustic spectroscopy in the study of biological photoreceptors, unidirectional photoinduced *E* to *Z* and *Z* to *E* isomerization of hindered chiral ethylenes, mesogenic interaction dynamics of liquid crystalline polymers studied by fluorescence, primary photosynthetic processes studied by pulsed EPR techniques, two-photon induced polymerization for 3D optical storage, application of azo polymers for photonics, homogeneous photocatalysis of generating molecular hydrogen, single molecule detection of biomolecules, and photogeneration and conversion of stable triplet carbenes.

Approximately 500 scientific participants from around the world are expected to attend the symposium.

For further information, contact Prof. Heinz D. Roth, Department of Chemistry and Chemical Biology, Rutgers University, 610 Taylor Road, New Brunswick, New Jersey 08854-8087, USA; E-mail: roth@rutchem.rutgers.edu; Tel.: +1 732 445 5664; Fax: +1 732 445 5312; Web site: <http://www.photoiupac.hu>.

10th International Symposium on Solubility Phenomena (10th ISSP), 22–26 July 2002, St. Constantine and Helen near Varna, Bulgaria



This symposium aims to discuss recent developments in the chemistry of solubility phenomena and their applications in chemical industry and to the environment, agriculture, health, treatment of marine-type solutions and of industrial wastes; to enhance scientific coopera-

tion at the international level through worldwide participation of academics; and to advertise the activities of IUPAC in these areas.

A workshop, “Solubility Phenomena—Applications for Environmental Improvement” (SOLPHEN-2002) will be held during the symposium (22–24 July). This workshop will be directed toward linkages between the fundamental chemistry of solubility and environmental improvement. It will focus mainly on the ecological problems of Balkan and Black Sea countries.

The symposium will feature subsections on quantitative structure–solubility relationships; crystallization from solutions; solubility diagrams, phase relationships, and their applications; application of solubility data in the fields of environment, agriculture, and health; and application of solubility data in the treatment of marine-type solutions and industrial wastes.

About 140 scientific participants from around the world are expected to attend the 10th ISSP.

For additional information, contact Prof. Dr. Christo Balarew, Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, Acad. G. Bonchev Str., Bl. 11, 1040 Sofia, Bulgaria; E-mail: balarew@svr.igic.bas.bg; Tel.: +359 2 9793925; Fax: +359 2 705024.

16th International Conference on Physical Organic Chemistry: Structure and Mechanism in Organic Chemistry, 4–9 August 2002, San Diego, California, USA

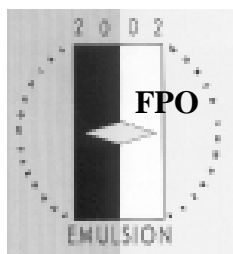


This meeting will offer a forum for researchers to present and discuss results in modern physical organic chemistry, and to demonstrate the strength, diversity, and applicability of research in the relationship between molecular structure and chemical reactivity. Plenary lectures will address coordination complexes, rotaxanes, small molecule synthesis, strained rings, self-assembly, nucleotide chemistry, molecular orbital theory, silicon chemistry, photochemistry, molecular machines, dendrimers, asymmetric synthesis, stereoselectivity, stereochemistry, conformational analysis, enantioselectivity, gas-phase ion chemistry, catalysis, macromolecular design, biomolecular mechanisms, mesoscale fabrication, materials, surface chemistry, isotope effects, and enzyme mechanisms

Approximately 350 scientific participants from around the world are expected to attend this conference.

For additional information, contact Prof. Charles L. Perrin, Department of Chemistry, University of California at San Diego, La Jolla, California 92093-0358, USA; E-mail: cperrin@ucsd.edu; Tel.: +1 858 534 2164; Fax: +1 858 822 0386.

3rd World Congress on Emulsions: From Fundamentals to Industrial Applications, 24–27 September 2002, Lyon, France



This congress is designed to advance exchanges between researchers, scientists, and engineers from all the different industries around the common theme of emulsions, and to encourage the transfer of technologies and fundamental knowledge in this field.

Emulsion is perceived in different ways by different industries. For the pharmaceutical, cosmetics, and food industries, emulsion is an intermediate product. For the paint industry, it is a raw material; in the road industry, it is the finished product. Similarly, the notion of formulation can be perceived in different ways; to some it means defining the dosage of products entering into the composition of emulsion, while to others, it means manufacturing a final product based on emulsion.

To satisfy the expectations of these different industries, this congress will corroborate the orientation toward applications, while paying due consideration to the contributions of fundamental research of academia.

Formulation, application, and processing of emulsion will be part of the scientific content of this congress, which will also take into account loaded emulsions and mixed disperse systems. A more important role will be reserved for process engineering and for manufacturing equipment and measurement tools.

The four main themes of the congress will focus on:

- formulation, preparation, and characterization of emulsions
- process engineering
- emulsion behavior in use
- industrial applications, case histories, new developments, and new constraints

As with the previous successful congresses in Paris in 1993 and in Bordeaux in 1997 (more than 1 000 participants from over 60 countries with 250 papers selected and published), this 3rd congress will feature an exhibition as well as a poster area where delegates can meet and different industries can demonstrate their most recent developments.

For more information, contact CME, 50 Place Marcel Pagnol, 92100 Boulogne-Billancourt, France, E-mail: alain.lecoroller@wanadoo.fr; Tel.: +33 1 47 61 76 89; Fax: +33 1 47 61 74 65; Web site: <http://www.cme-emulsion.com>.

Conference Calendar

Visit <http://www.iupac.org> for complete information and further links.

NEW designates a new conference since the last issue.

2001

Free-Radical Polymerization

3–8 June 2001

3rd International Symposium on Free-radical Polymerization: Kinetics and Mechanism, Lucca, Italy.

Prof. M. Buback, Institute for Physical Chemistry, University of Göttingen, Tammannstr. 6, D-37077 Göttingen, Germany
Tel.: +49 551 393141
Fax: +49 551 393144
E-mail: mbuback@gwdg.de

CHEMRAWN XIV

9–13 June 2001

Chemrawn Conference—Toward Environmentally Benign Processes and Products, Boulder, Colorado, USA.

Dr. Dennis L. Hjeresen, Environmental Management Program, Los Alamos National Laboratory - Mail Stop J591, Los Alamos, NM 87545.

Tel.: +1 505 665 7251

Fax: +1 505 665 8118

E-mail: dennish@lanl.gov

High-Temperature Superconductors

24–30 June 2001

6th International Workshop on High-Temperature Superconductors and Novel Inorganic Materials Engineering (MSU-HTSC-VI), Moscow to St. Petersburg, Russia.

Prof. Yu.D. Tretyakov, Chairman, Dr. R.V. Shpanchenko, MSU-HTSC VI Secretary, Department of Chemistry, Moscow State University, Moscow 119899

Russia

Tel.: +7 (095) 939 34 90

Fax: +7 (095) 939 47 88

E-mail: roms@icr.chem.msu.ru

Polymer Dispersions

25–28 June 2001

15th International Conference on Polymers: Preparation of Non-Conventional Polymer Dispersions, Smolenice, Slovak Republic.

Prof. Ignac Capek, Polymer Institute, Slovak Academy of Sciences, SR-842-36 Bratislava, Slovak Republic

Tel.: +421 7 5477 2469

Fax: +421 7 5477 5923

E-mail: upolign@savba.sk

IUPAC 41st General Assembly

29 June–8 July 2001

Brisbane, Australia.

IUPAC Secretariat.
Tel.: +1 919 485 8700
Fax: +1 919 485 8706
E-mail: secretariat@iupac.org

IUPAC 38th Congress/World Chemistry Congress 2001

1–6 July 2001
Brisbane, Australia.
Congress Secretariat, P.O. Box 177, Red Hill Q 4054, Australia.
Tel.: + 61 7 3368 2644
Fax: + 61 7 3369 3731
E-mail: wcc2001@ccm.com.au

Coordination and Organometallic Chemistry of Germanium, Tin, and Lead

8–12 July 2001
10th International Conference on the Coordination and Organometallic Chemistry of Germanium, Tin, and Lead, Talence, France.
Dr. B. Jousseume, Laboratoire de Chimie Organique et Organometallique, UMR 5802, Université Bordeaux 1, 351 avenue de la Libération, F-33405 Talence Cedex, France.
Tel.: +33 (0) 5 56 84 64 43
Fax: +33 (0) 5 59 84 69 94
E-mail: b.jousseume@lcoo.u-bordeaux.fr

Scattering Methods and Polymers

9–12 July 2001
20th Discussion Conference on Scattering Methods for the Investigation of Polymers, Prague, Czech Republic.
Dr. Drahomir Vyprachticky, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyrovskeho nam. 2, CZ-162 06 Praha 6, Czech Republic.
Tel.: +420 2 204 0332
Fax: +420 2 367 981
E-mail: sympo@imc.cas.cz

Plasma Chemistry

9–13 July 2001
15th International Symposium on Plasma Chemistry (ISPC-15), Orléans, France.
Prof. Jean-Michel Pouvesle,

Laboratoire GREMI, Université d'Orléans, BP 6744, Orléans Cedex 2, France
Tel.: +33 (0) 2 38417124
Fax: +33 (0) 2 38417154
E-mail: jean-michel.pouvesle@univ-orleans.fr

Polymer Membranes

16–19 July 2001
41st Microsymposium on Polymer Membranes, Prague, Czech Republic.
Dr. Drahomir Vyprachticky, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyrovskeho nam. 2, CZ-162 06 Praha 6, Czech Republic.
Tel.: +420 2 204 03332
Fax: +420 2 367 981
E-mail: sympo@imc.cas.cz

Organometallic Chemistry

22–26 July 2001
11th IUPAC International Symposium on Organometallic Chemistry Directed Towards Organic Synthesis (OMCOS 11), Tapei, Taiwan.
Prof. Tien-Yau Luh, Department of Chemistry, National Taiwan University, Tapei 106, Taiwan.
Tel.: +886 2 23636288
Fax: +886 2 23644971
E-mail: tyluh@ccms.ntu.edu.tw

Phosphorus Chemistry

29 July–3 August 2001
15th International Conference on Phosphorus Chemistry, Sendai, Japan.
Prof. Masaaki Yoshifuji, Department of Chemistry, Graduate School of Science, Tohoku University, Aoba, Sendai 980-8578, Japan.
Tel.: +81 22 217 6558
Fax: +81 22 217 6562
E-mail: yoshiff@mail.cc.tohoku.ac.jp

Chemistry and Quality of Life

30 July–4 August 2001 **NEW**
8th International Chemistry Conference in Africa, Dakar,

How to Apply for IUPAC Sponsorship

To apply for IUPAC sponsorship, conference organizers should complete an Advance Information Questionnaire (AIQ). The AIQ form is available at <http://www.iupac.org> or by request at the IUPAC Secretariat, and should be returned between 2 years and 12 months before the conference. Further information on granting sponsorship is included in the AIQ and available online.

Sénégal.

Prof. Libasse Diop, Faculty of Sciences and Technology, University Cheikh Anta Diop BP 5005, Dakar, Sénégal
Tel.: +221 824 8187
Fax: +221 824 6318
E-mail: libasse@enda.sn

Analytical Sciences

6–10 August 2001
International Congress on Analytical Sciences 2001 (ICAS2001), Tokyo, Japan.
Prof. Tsuguo Sawada, Chairman, Department of Applied Chemistry, The University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan.
Tel.: +81 3 5841 7236 (or 7237)
Fax: +81 3 5841 6037
E-mail: icas2001@lasert.u-tokyo.ac.jp

Macromolecules–Metal Complexes

19–23 August 2001
9th International Symposium on Macromolecules–Metal Complexes (MMC-9), Brooklyn, New York, USA.
Prof. K. Levon Polymer Research Institute Polytechnic University Brooklyn, NY 11201, USA.
Tel.: +1 718 260 3339
Fax: +1 718 260 3125
E-mail: klevon@poly.edu

Solution Chemistry

26–31 August 2001

27th International Conference on Solution Chemistry (27ICSC), Vaals, Netherlands.

Dr. Christian Dux, Conference Secretary of 27th ICSC, Institute of Physical Chemistry, RWTH-Aachen, D-52062, Aachen, Germany

Tel.: +49 241 80 4752 or +49 241 80 4712

Fax: +49 241 8888 327 or +49 241 8888 128

E-mail: 27icsc@liquid.pc.rwth-aachen.de

Medicinal Chemistry

2–6 September 2001

Hungarian–German–Italian–Polish Joint Meeting on Medicinal Chemistry, Budapest, Hungary.

Dr. Péter Mátyus, Institute of Organic Chemistry Semmelweis University H-1092 Budapest, Hungary

Fax: +36-1-217-0851

E-mail: matypet@szerves.sote.hu

Ionic Polymerization

22–26 October 2001

4th International Symposium on Ionic Polymerization, Crete, Greece.

Dr. Nikos Hadjichristidis, University of Athens, Department of Chemistry, Panepistimiopolis, Zografou, GR-157 71 Athens, Greece

Tel.: +30 1 724 9103

Fax: +30 1 722 1800

E-mail: hadjichristidis@chem.uoa.gr

Biodiversity

3–8 November 2001

3rd IUPAC International Conference on Biodiversity (ICOB-3), Antalya, Turkey.

Prof. B. Sener, Department of Pharmacognosy, Faculty of Pharmacy, Gazi University, P.O. Box 143 06572, Maltepe-Ankara, Turkey.

Tel.: +90 312 212 2267

Fax: +90 312 213 3921

E-mail: blgsener@tr-net.net.tr

Polymers

11–15 November 2001

6th Brazilian Polymer Conference / IX International Macromolecular Colloquium, Gramado, RS, Brazil.

Prof. Raquel Santos Mauler, Instituto de Química, Universidade Federal do Rio Grande do Sul, Av. Bento Gonçalves, 9500, 91501-970 Porto Alegre, RS - Brazil

Tel.: +55 51 3166296

Fax: +55 51 319 1499

E-mail: mauler@if.ufrgs.br

Sweeteners

13–17 November 2001

2nd International Symposium on Sweeteners, Hiroshima-Shi, Japan.

Prof. Kasuo Yamasaki, Institute of Pharmaceutical Sciences, Faculty of Medicine, Hiroshima University Kasumi, Minami-ku, Hiroshima 734-8551, Japan.

Tel.: +81 82 257 5285

Fax: +81 82 257 5289

E-mail: yamasaki@pharm.hiroshima-u.ac.jp

2002

Polymer Characterization

7–11 January 2002

10th International Conference on Polymer Characterization (POLYCHAR), Denton, Texas, USA.

Dr. Witold Brostow, Department of Materials Science, University of North Texas, Denton, Texas, 76203-5310 USA

Tel.: +1 940 565 4358, -3262, or 4337

Fax: +1 940 565 4824

E-mail: brostow@unt.edu or polychar@marta.phys.unt.edu

Bioinformatics

6–8 February 2002

The International Conference on Bioinformatics 2002: North–South Networking,

Bangkok, Thailand.

Dr. Prasit Palittapongarnpim, BIOTEC, 15th Fl, Gypsum Metropolitan Tower, 539/2 Sri-Ayudhya Road, Ratchadevi, Bangkok, Thailand

Tel.: +66 2 642532231, ext 228

Fax: +66 2 488304

E-mail: incob@biotec.or.th

Macromolecules

6–10 February 2002

5th Annual UNESCO School and South African IUPAC Conference on Macromolecules and Materials Science, Stellenbosch, South Africa.

Prof. R. D. Sanderson, UNESCO Associated Centre for Macromolecules and Materials, Institute for Polymer Science, University of Stellenbosch, Private Bag XI, Matieland 7602, South Africa

Tel.: +27 21 808 3172

Fax: +27 21 808 4967

E-mail: rds@maties.sun.ac.za

Drug Residue Analysis

4–7 June 2002

4th International Symposium on Hormone and Veterinary Drug Residue Analysis, Antwerp, Belgium.

Prof. C. Van Peteghem, Ghent University, Faculty of Pharmaceutical Sciences, Harelbekestraat 72, B-9000 Gent, Belgium

Tel.: +32 9 264 81 15

Fax: +32 9 264 81 99

E-mail: carlos.vanpeteghem@rug.ac.be

Macromolecules

7–12 July 2002

39th International Symposium on Macromolecules - IUPAC World Polymer Congress 2002 (MACRO 2002), Beijing, China.

Prof. Fosong Wang, The Chinese Academy of Sciences, Beijing 100864, China

Tel.: +86 10 62563060

Fax: +86 10 62573911

E-mail: fswang@mimi.cnc.ac.cn

Solid-State Chemistry **NEW**

7–12 July 2002

5th Conference on Solid-State Chemistry (SSC 2002), Bratislava, Slovakia.*Prof. P. Šajgalik, Slovak Academy of Sciences, Dubravská c.**Bratislava, SK-842 36 Slovakia**Tel.: +421 7 59410400**Fax: +421 7 59410444**E-mail: ssc2002@savba.sk***Organic Synthesis**

14–19 July 2002

14th International Conference on Organic Synthesis (ICOS-14), Christchurch, New Zealand.*Prof. Margaret A. Brimble, Department of Chemistry, University of Auckland, 23 Symonds St., Auckland, New Zealand**Tel.: +64 9 373 7599, Ext. 8259**Fax: +64 9 373 7422**E-mail: m.brimble@**auckland.ac.nz***Photochemistry** **NEW**

14–19 July 2002

XIX IUPAC Symposium on Photochemistry, Budapest, Hungary.

*Prof. H. D. Roth, Rutgers University, Department of Chemistry and Chemical Biology**610 Taylor Road, New Brunswick, NJ 08854-8087**Tel.: +1 732 445 5664**Fax: +1 732 445 5312**E-mail: roth@rutchem.rutgers.edu***Solubility Phenomena** **NEW**

22–26 July 2002

International Symposium on Solubility Phenomena (10th ISSP), Varna, Bulgaria.*Prof. Christo Balarew, Institute of General and Inorganic Chemistry, Bulgarian Academy of Sciences, BG-Sofia 1040, Bulgaria**Tel.: +359 (2) 9793925**Fax: +359 (2) 705 024**E-mail: balarew@svr.igic.bas.bg***Chemical Thermodynamics**

28 July–2 August 2002

17th IUPAC Conference on Chemical Thermodynamics, Rostock, Germany.*Prof. A. Heintz, FB Chemie, Universität Rostock, Hermannstr. 14, D-18051 Rostock, Germany**Tel.: +49 381 498 1852**Fax: +49 381 498 1854**E-mail: andreas.heintz@chemie.uni-rostock.de***Crop Protection**

4–9 August 2002

10th IUPAC International Congress on the Chemistry of Crop Protection (formerly International Congress of Pesticide Chemistry), Basel, Switzerland.*Dr. Bernard Donzel, c/o Novartis CP AG, WRO-1060.3.06, CH-4002 Basel, Switzerland**Tel.: +41 61 697 22 67**Fax: +41 61 697 74 72**E-mail: bernard.donzel@cp.novartis.com***Physical Organic Chemistry** **NEW**

4–9 August 2002

16th International Conference on Physical Organic Chemistry: Structure and Mechanism in Organic Chemistry, San Diego, California, USA.*Prof. Charles L. Perrin, Department of Chemistry, University of California at San Diego, La Jolla, California 92093-0358, USA**Tel.: +1 858 534 2164**Fax: +1 858 822 0386**E-mail: cperrin@ucsd.edu***Bioorganic Chemistry**

11–14 August 2002

6th International Symposium on Bioorganic Chemistry (ISBOC-6), Toronto, Canada.*Dr. Ronald Kluger, Department of Chemistry, University of Toronto, Toronto, Canada M5S 3H6.**Tel.: +1 416 978 3582**Fax: +1 416 978 3482**E-mail: rkluger@chem.utoronto.ca***Visas**

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Chemical Education

18–23 August 2002

The 17th International Conference on Chemical Education (17th ICCE)—New Strategies for Chemical Education in the New Century, Beijing, China.*Prof. Xibai QIU, 17th ICCE c/o Chinese Chemical Society, P.O. Box 2709 Beijing 100080, China**Tel.: +86 10 62568157, 86 10 62564020**Fax: +86 10 62568157**E-mail: qiuxb@infoc3.icas.ac.cn***Polymer Science and Technology**

2–5 December 2002

IUPAC Polymer Conference on the Mission and Challenges of Polymer Science and Technology, Kyoto, Japan.

*Prof. Seiichi Nakahama, Faculty of Engineering, Tokyo Institute of Technology, 2-12-1 Ohokayama, Meguro-ku, Tokyo 152-8552, Japan.**Tel.: +81 3 5734 2138**Fax: +81 3 5734 2887**E-mail: snakaham@polymer.titech.ac.jp*