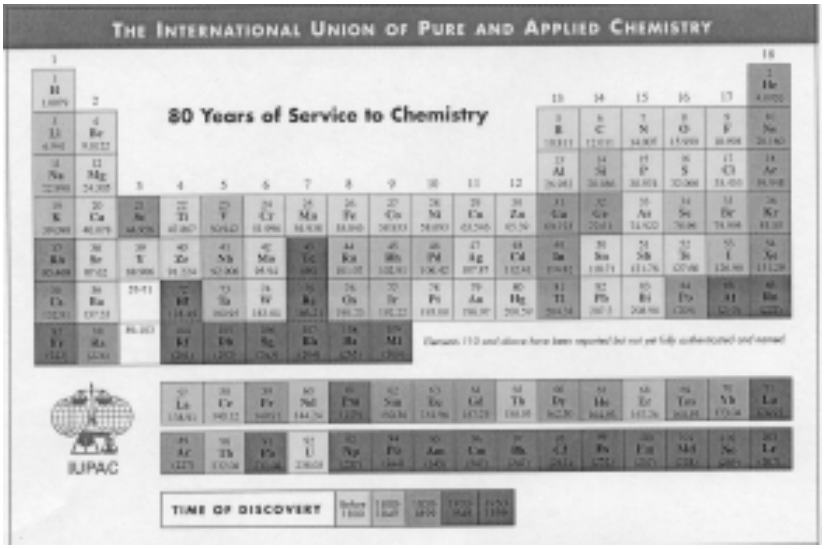
IUPAC Celebrates 80 Years of Service to Chemistry with Commemorative Periodic Table

Prof. Herbert D. Kaesz (Department of Chemistry and Biochemistry, University of California at Los Angeles, Los Angeles, California 90095-1569, USA; E-mail: hdk@chem.ucla.edu), Chairman of the IUPAC Commission on Nomenclature of Inorganic Chemistry (II.2), has submitted the following brief text to accompany the commemorative periodic table inserted in the mailing with this issue of *Chemistry International* (see also cover illustration). The material below has been excerpted from a paper currently in preparation by Prof. W. H. Koppenol (a former Titular Member and Secretary of Commission II.2) on the procedures for naming new elements, and it incorporates suggestions offered by Prof. John Corish (President of IUPAC's Inorganic Chemistry Division II) and Dr. Gerd M. Rosenblatt (Vice President of Division II).

The right to name a new element has traditionally been accorded by the scientific community to the discoverer(s) after claims have been established beyond a doubt. Since 1947, names suggested by discoverers have been reviewed for suitability by the IUPAC Commission on Nomenclature of Inorganic Chemistry (II.2), and the accepted name has been forwarded for approval to the IUPAC Council. To avoid confusion, discoverers are asked to use an atomic number rather than a name in the literature until approval of a proposed name is received from IUPAC. If a particular name has been used unofficially for a given element but a different name is ultimately chosen, the first name *cannot* be transferred at a later time to designate a different element.



The most recent process of review and approval of the names for elements 101–109 (IUPAC Recommendations 1997) appeared in *Pure and Applied Chemistry*, Vol. 69, No. 12, pp. 2471–2473 (1997), and a summary was published in *Chemistry International*, Vol. 20, No. 2, pp. 37–38 (1998). Because claims of the synthesis of heavy elements can be controversial, a joint Working Party of the International Unions of Pure and Applied Chemistry (IUPAC) and Physics (IUPAP) has been established to review published details and assign priority in the discovery. This procedure was applied to elements 101–109, and it is now in force for elements 110 and beyond. A more complete report on the procedures for naming new elements is in now preparation for submittal to *Pure and Applied Chemistry*.

Report on First Workshop on Thermochemical, Thermodynamic, and Transport Properties of Halogenated Hydrocarbons and Mixtures, Pisa, Italy, 15–18 December 1999

Dr. John H. Dymond (Department of Chemistry, University of Glasgow, University Avenue, Glasgow, Scotland G12 8QQ, UK; E-mail: johnd@chem.gla.ac.uk), Secretary of the IUPAC Commission on Thermodynamics (I.2), has submitted the following report:

The objective of this IUPAC project is to increase knowledge and understanding of the thermodynamic and transport properties of halogenated organic compounds–especially halogenated aliphatic hydrocarbons–and of their mixtures, and also of their mixtures with hydrocarbons.

The aims of this first workshop, held under the auspices of the IUPAC Commission on Thermodynamics (I.2) were as follows:

- to review the available experimental data for these systems (density, speed of sound, vapor pressure, viscosity, thermal conductivity, etc., with the addition of phase equilibria and excess properties for mixtures) in order to identify areas for further study;
- to consider available methods for thermodynamic modeling, including EOS for pure fluids and mixtures, innovative mixing rules, model intercomparisons, computer simulations, and model approaches for the transport properties; and
- to select key systems and topics for collaborative research to be carried out for presentation and discussion of the results at future workshops.

There were eight invited lectures. In the opening lecture, Prof. J. Gmehling (University of Oldenburg, Germany) reviewed the data situation by reference to the information stored in the Dortmund Data Bank, and pointed out data gaps and limitations in the temperature range of the data. He also gave results of selected predictive methods for certain properties. Dr. A. Laesecke (NIST, Boulder, CO, USA) pointed out the serious discrepancies that existed between different sets of viscosity data reported in the literature for refrigerants and alternative refrigerants, and showed how they arose from failure to apply the correct working equation for the viscometer. He discussed the metrology advances at NIST in viscosity and thermal conductivity measurement and reported results on binary and ternary fluorocarbon mixtures. Prof. M. J. Assael (Aristotle University, Thessaloniki, Greece) suggested R135a as a calibrant fluid for such measurements. He reported the temperature and pressure dependence of recent transport property measurements on methane-, ethane-, and propane-derived halogenated refrigerants and described a hard-sphere-based scheme for their correlation. Prof. K. Watanabe (Keio University, Yokahama, Japan) gave an overview of state-of-the-art thermodynamic property measurement and thermodynamic property modeling of halogenated hydrocarbon refrigerants, with reference to technically important HFCs and their mixtures and also fluorinated ethers. Dr. J. H. Dymond (University of Glasgow) concentrated on second virial coefficients of halocarbons and the transport properties of the liquids at saturation pressure, pointing out data needs and the degree of success of data correlation with current methods. Dr. S. B. Kiselev (Colorado School of Mines, Golden, CO, USA) described a new crossover approach for the prediction of thermodynamic and transport properties of pure fluids and binary mixtures in and beyond the critical region. Dr. M. Quintel (University Hospital, Mannheim, Germany) described the use of perfluorocarbons as artificial oxygen carriers and in liquid ventilation, pointing out that future possible use of these compounds depended on detailed knowledge of their properties. Prof. J.A. Glasysz (Universität Erlangen-Nürnberg, Germany) illustrated the importance of fluorous compounds in biphasic catalysis, and showed the need for physical property data for the optimum design of these compounds.

Dr. H. V. Kehiaian (University of Paris 7) reported on the IUCODIX Project for the transfer of standardized electronic numerical data files from data generators to data users. The aim of this project is to build on the work of the IUPAC-CODATA Task Group to improve the accessibility of numerical data. This effort will result in the design and use of standard data formats for the presentation and exchange of numerical data.

There were 30 oral communications and a poster discussion session for the 30 poster presentations. The workshop closed with a round-table discussion to consider the priorities for further research. Details can be found at http://www.iupac.org/divisions/current_projects/1998/121_18_98.html.

The proceedings of this workshop will be published as a special issue of *Fluid Phase Equilibria*.

This highly successful workshop, which attracted 90 participants, was excellently organized by Prof. E. Matteoli (Pisa) and his Scientific and Local Organizing Committees. The next workshop, to be organized by Prof. Dominique Richon (École Nationale Supérieure des Mines de Paris), is planned for March/April 2001.

Report on the 2000 Annual Meeting of the Consultative Committee for Amount of Substance (CCQM), International Bureau of Weights and Measures (BIPM) Headquarters, 4–7 April 2000, Sèvres, France

Dr. Aleš Fajgelj (Quality Assurance Supervisor, International Atomic Energy Agency Laboratories, A-2444 Seibersdorf, Austria; E-mail: A.Fajgelj@iaea.org), Chairman of the IUPAC Interdivisional Working Party on Harmonization of Quality Assurance Schemes for Analytical Laboratories, has submitted the report published below. Please note that all statements contained therein reflect only the author's opinion; at the time of the report's preparation, no official minutes had been issued by CCQM (BIPM).

As the IUPAC representative, I attended the 2000 annual meeting of the Consultative Committee on Amount of Substance (CCQM) at the BIPM Headquarters in Sèvres, France, 4–7 April 2000. Items discussed included the mutual recognition arrangement, structure of the information database on CCQM key-comparisons, reports from working groups, and biometrology. The most important part of the meeting was a symposium on "Primary Methods of Analysis". CCQM is the highest metrological body involved with metrology in chemistry; within its authority, the following methods have so far been identified as potentially primary: gravimetry, coulometry, titrimetry, and isotope dilution mass spectrometry.

It has been recognized for some time that a method *per se* is not enough to deliver results expected for primary methods—that is, results with the smallest possible measurement uncertainty and direct traceability to basic units of the International System of Units (SI). A combination of matrix, analyte, method, and analyst defines what level of traceability and uncertainty can be achieved in practice. In this sense, it was the aim of the symposium to investigate the following analytical methods with respect to their potential for being primary methods of analysis:

- coulometry for determining purity
- differential scanning calorimetry for determining purity
- integrated instrumental methods for determining purity
- titrimetric determination of copper in an elemental solution
- gravimetric determination of sodium in serum
- ID-GC/MS for clinical diagnostic markers
- ID-ICP-MS for trace elements in natural waters
- INAA for arsenic in semiconductor materials
- ICP-OES for major elements in a high-temperature alloy
- cavity ring down spectroscopy for gas purity measurements
- absolute isotopic ratio measurements for determining amount of substance

A required scope for all presentations encompassed underlying principle(s) of methodology, basis for being primary method (in principle and in practice), critical review of best practices, scope of applicability (limits and boundary conditions), and example(s) with quantified measurement uncertainty.

No instant conclusion emerged at the meeting to declare one or more of the methods as having primary characteristics. Apparently, the very high quality of most of the presentations and examples was somewhat overwhelming to the Committee. For this reason, it is unlikely that additional methods will soon be added to the list of primary methods, although it was recognized that some of the methods presented might produce results of the highest metrological quality. A popular opinion at the CCQM after the presentations was that, rather than declaring methods as being primary, one should see if the methods applied and the results obtained (i.e., traceability and measurement uncertainty) are really "fit for purpose". Therefore, a traditional distinction between "primary" and "other" methods of analysis does not play as important a role as the use of validated methods that are "fit for their intended use".

By definition, primary methods are being applied in production of primary reference materials. For this reason, the above-mentioned change in the perception of analytical methods has a very strong influence on the characterization and certification of reference materials. This change was immediately reflected at the meeting of the ISO Committee on Reference Materials (ISO REMCO, held in Geneva, Switzerland, 15–17 May 2000; see report on page 167), specifically in the preparation of a new ISO Guide 35, "Certification of Reference Materials—General and Statistical Principles".

Report on the 32nd Codex Committee on Pesticide Residues (CCPR) Meeting, 1–5 May 2000, The Hague, Netherlands

Dr. Kenneth D. Racke (Dow AgroSciences, 9330 Zionsville Road, Building 308/2B, Indianapolis, Indiana 46033, USA; E-mail: kracke@dowagro.com), Chairman of IUPAC's Commission on Agrochemicals and the Environment (VI.4), has contributed the following report in his capacity as head of the IUPAC delegation to the 32nd CCPR Meeting:

General

This meeting included approximately 55 national and 15 observer delegations (including IUPAC). The Codex MRL-setting process is a slow one, and the current meeting provided evidence that this will continue to be the case for the foreseeable future. CCPR is active both in recommending new maximum residue limits (MRLs) and in reviewing existing MRLs via a periodic review program. For a third consecutive year, the meeting was attended by a small but quite vocal activist group, Consumers International (CI). This group made many comments related to the sensitivity of children, the need for conservative approaches for dietary risk assessment, and the need for cumulative exposure assessment of pesticides with a common mechanism of toxicity. A large observer delegation also attended on behalf of industry (Global Crop Protection Federation), which distributed a series of position papers on several topics of interest.

Chronic Dietary Assessment and Risk Management Options

The CCPR continues to use calculations of the theoretical maximum daily intake (TMDI, based on MRL intake) and international estimated daily intake (IEDI, based on supervised trial median residues, SMTRs) against the acceptable daily intake (ADI) to determine the acceptability of newly proposed or reevaluated MRLs. This methodology was refined and supported by the recently concluded IUPAC project, "Optimum use of available residue data in the estimation of dietary intake of pesticide residues" (*Pure Appl. Chem.* **69**, 1373–1410, 1997).

Some controversy had arisen at the last CCPR Meeting as to what risk management steps are available when the IEDI is exceeded. Australia had prepared a discussion paper titled "Proposed Measures When Dietary Exposure Estimates Exceed the ADI". Current practice is to withhold final approval of MRLs pending production of additional data to allow a more refined assessment and/or withdrawal of one or more uses by the manufacturer. The option is whether instead to proceed with approval of MRLs in such instances but, recognizing the conservative nature of the IEDI calculation, flag such Codex limits (CXLs) as candidates for further assessment by national regulatory authorities. After spirited discussion, the Committee agreed to maintain the current practice but, by circular letter also obtain from national authorities their views on such practices and options that the CCPR should consider in the future. Some other potential options identified in the discussion paper included use of monitoring data for intake assessment refinement, consideration of percentage of crop treated, and reliance by CCPR on more sophisticated national dietary intake assessments. Australia agreed to summarize inputs from national authorities and bring these forward at the 2001 CCPR Meeting. [CX/PR 00/7]

Acute Dietary Assessment and Risk Management Options

A topic of much interest once again at the CCPR Meeting was acute dietary risk assessment. Having reached agreement on the basic methodologies for the international estimate of short-term dietary intake (IESTI) through a couple of past consultations and an ad hoc expert meeting before the 1999 CCPR Meeting, the Joint FAO/WHO Meeting on Pesticide Residues (JMPR) had been directed to begin implementation of such calculations for adults and children for acutely toxic pesticides. Although the JMPR has been setting acute reference dose (ARfD) when it felt necessary during the past several years, the 1999 JMPR was the first to employ and report such IEDI calculations (see 1999 JMPR Report, Appendix IV). For each commodity for which an MRL is proposed or already exists, a single-tier assessment is available, which is based on maximum residues observed in field trials multiplied by an uncertainty factor; there is no level of refinement available short of generating new field residue data. One change suggested by the JMPR and endorsed by CCPR was to employ a variability factor of 7 instead of 10 for medium-sized commodities.

The CCPR chair, Wim van Eck, had prepared a discussion paper titled "Acute Dietary Risk Assessment of Pesticide Residues and Risk Management Options" to summarize his proposal for how the IESTI calculations would be used by CCPR in setting and reviewing MRLs. Basically, if the IESTI for a given commodity exceeds the ARfD and further refinement through generation of new data will not result in an acceptable calculation, the proposed MRL will not be advanced. It was understood that this same approach would be used also with existing CXLs for acutely toxic pesticides. The CCPR endorsed such an approach on an interim basis, but also agreed to continue to seek refined approaches to acute dietary intake assessment and also to solicit national authority comments on their approaches to acute dietary intake assessment. This refinement should be greatly assisted by the ongoing IUPAC project on "Acute Dietary Intake Assessment".

Several delegations expressed concern over the highly conservative nature of the current approach. For example, the Netherlands indicated that some comparison of probabilistic acute dietary calculations at the 99.99 percentile with the IESTI employed by CCPR revealed the latter of these approaches to be more conservative. It was anticipated that at some point in the future, an expert consultation on refined approaches to acute dietary assessment will likely be held, and this matter was tabled for discussion until the 2001 CCPR Meeting. [CX/PR 00/3]

Development of Databases for Acute Exposure Assessment

Dr. Jerry Moy shared "Progress Report on the Development of Databases for Acute Exposure Assessment". The CCPR-endorsed methodology for the IESTI calculation employs 97.5 percentile body weights for adults and children and also 97.5 percentile consumption data (eaters only) for each commodity of interest for acute intake assessment. Because consumption data had only been provided by six countries (Australia, Japan, United States, France, Netherlands, and United Kingdom), it has not been possible to construct regional diets, as is the case for chronic dietary assessment. Instead, the highest 97.5 percentile consumption among each of these six countries has been chosen so as to create a single database of global "super-eaters". [CX/PR 00/3-Add.1]

Sensitivity of Infants and Children

Significant discussion occurred related to the issue of the potentially greater sensitivity of infants and children than adults to pesticides. Based on a request from last year's CCPR Meeting, the 1999 JMPR had reviewed this issue and concluded in its report: "The routine use of safety factors in addition to those currently used is not justified on the basis of current information". JMPR/WHO Joint Secretary John Herrman indicated that JMPR evaluates all the relevant data for each pesticide, including studies on developmental toxicity, and makes a case-by-case determination based on the most sensitive endpoints for establishment of no observed effect levels (NOELs) and ADIs. A room document circulated by Consumers International castigated the JMPR for its inability to reach the same answer as the U.S. National Academy of Sciences had several years ago, and pressed for an expert consultation of pediatric specialists to provide guidance on the issue. The delegations of Germany and France made statements regarding their concerns also for proper protection of infants, although the former had a more sweeping concern and the latter had a narrower concern (i.e., perhaps only ten or so pesticides really are of high concern). After some discussion (see also section below on MRLs for baby food), the CCPR agreed to support the JMPR position, but encouraged the JMPR to consider with each individual chemical review the specific evidence available that would indicate greater sensitivity of the young. In addition, a circular letter from CCPR to national governments will request information on the nature and rationale for their concerns related to infant and child sensitivity to pesticides, including a listing of specific pesticides already identified as being of national concern. The 2001 CCPR Meeting would then consider further the option of an expert consultation on child sensitivity to pesticides. [CRD 16]

Establishment of Special MRLs for Cereal-Based Baby Food

At the last meeting of the CCPR, the German delegation had been asked to prepare a paper dealing with pesticide considerations and baby foods, and a document introduced for review by the 2000 CCPR was titled "Feasibility of Establishing Specific MRLs for Cereal-Based Foods and Infant Formula". The paper was strongly focused on age-related differences in susceptibility to pesticides and contained a set of ten recommendations that included development of additional data requirements (e.g., developmental neurotoxicity), adoption of a very low common limit for residues of pesticides in processed cereal-based foods for infants and children and infant formula, and consideration of whether to require new residue testing data for processed children's foods or to set separate child-MRLs for the raw agricultural components of these foods.

Although the common very low limit proposal was supported by the EC Delegation, several delegations (e.g., Australia, Canada, and the United States) expressed strong reservations about the approaches outlined in the German paper or the real need for any special approach on cereal foods and infant formula. At the end of the discussion, the CCPR concluded that 1) at present, CXLs were not being set for composite foods, 2) such an approach would require new methodology so complicated as to be infeasible, 3) some delegations questioned the need for such an approach, 4) consensus could not be reached on setting a low MRL for baby food or child-MRLs for raw commodities, and endorsed the ALINORM 99/26 statement that if the presence of pesticides in such baby foods is technically unavoidable, they are to be reduced to the maximum extent possible. [CX/PR 00/9]

FAO Specifications: Future Link with JMPR Reviews

Some discussion occurred related to the proposal of the 1999 JMPR report to schedule only those pesticides for a first or periodic review for which FAO specifications have been established. JMPR recognized that it might take some time before this recommendation is fully implemented. Several concerns related to this proposal were raised, including whether it was reasonable to expect specifications to be set for new pesticides (i.e., still under patent and not subject to generic manufacture) before Codex MRL establishment. The CCPR, however, supported the recommendation of JMPR in linking the Codex MRL and FAO specification processes, and directed the informal Working Group on Priorities to explore ways of aligning the JMPR future schedule with that of the FAO specification process.

Establishing MRLs to Accommodate Genetically Modified Organism (GMO) Crops

A short discussion paper on establishing MRLs to accommodate genetically modified organism (GMO) crops was advanced by Canada for discussion. The primary focus was on herbicide-tolerance GMO crops, which may have either an altered balance of metabolite versus parent or new metabolites as compared with non-GMO crops. The paper concluded that an MRL for a given commodity must accommodate both traditional and GMO crops, but that it is not possible to establish separate MRLs for GMO crops, owing to analytical difficulties. A number of delegates supported this approach, but a few (e.g., Germany) seemed interested in establishing separate residue definitions in some cases where new metabolites occurred in the GMO. Based on discussion, it was agreed to issue a circular letter to national authorities as to how they currently deal with residue definition and enforcement monitoring for GMO crops. A summary of responses will be collected by Canada and advanced at the 2001 CCPR Meeting for further discussion. [CX/PR 00/8]

Proposal for a Baker's Dozen of New Regional Diets

A proposal to replace the 5 existing world diets used for chronic dietary assessment with 13 regional "consumption cluster" diets was again advanced in a report from WHO. A statistical method was employed to group countries into the 13 units. The proposal would require compilation of an extensive dietary survey of a number of the clusters for which inadequate consumption data are currently available. There was general concern from the Committee about the proliferation of regional diets and complication of the dietary assessment process. Questions arose as to whether the 5 existing diets might not already be adequate and whether an increase to 9 regional diets might be more reasonable. In addition, several delegations expressed concern that proliferation of the number of world diets would potentially increase the likelihood that the TMDI or IEDI would exceed the ADI for at least one region, thereby blocking future progress in advancing MRLs. The present European diet, which most often is that of the region with a calculated ADI exceedence, was used as an example; it would be split into 5 separate clusters with the new system. Based on these concerns, WHO agreed to prepare a revised proposal for the 2001 CCPR Meeting and also to bring forward some example chronic intake calculations for the 5 vs. 13 dietary region approaches. [CX/PR/00/4]

Harmonization of MRLs for Crop Pesticides and Animal Drugs

A discussion paper on harmonization of MRL-setting for compounds used both as pesticides and veterinary drugs was advanced by WHO. At present, the CCPR establishes animal product MRLs for plant pesticides and external veterinary products (e.g., sheep dips and cattle sprays), whereas the Codex Committee on Residues of Veterinary Drugs in Foods (CCRVDF) develops MRLs for internal veterinary products. At times, different residue definitions and MRLs for the same commodities and pesticides have been established by each committee. Harmonization of some animal commodity definitions has already occurred, but CCPR refused to rename "meat" per the CCRVDF term "muscle". The Committee agreed to seek fuller cooperation with CCRVDF, and also directed JMPR to seek liaison with the CCRVDF-equivalent Joint Expert Committee on Food Additives (JECFA) earlier in the evaluation process for chemicals of joint interest, but harmonization in the Codex world clearly has a long road ahead. [CX/PR 00/6]

Pesticide Residue Problems in Developing Countries

The ad hoc working group on problems related to pesticide residues in food in developing countries considered two papers. South Africa brought forward a discussion document that highlighted issues related to import residue problems of tropical and minor crops, which often lack CXLs as well as national MRLs in importing countries. The best option at present appears to be for developing countries, as well as bilateral partnerships such as COLEACP (Europe-Africa-Caribbean-Pacific Liaison Committee for the Promotion of Tropical Fruits and Off-Season Vegetables), to generate and submit residue trial data to JMPR and/or national governments to establish MRLs. India brought forward a discussion document that focused on the need for MRLs or extraneous maximum residue limits (EMRLs) for spices, which frequently are found to contain violative residues of existing or banned pesticides (e.g., DDT), presumably owing to spray drift, environmental contamination, or possible unauthorized use. Although field residue trials data are required to set MRLs for spices, monitoring data are required instead for setting EMRLs for environmental contaminants. India agreed to serve as data collection coordinator for spice residue information to be brought forward to JMPR in the future. [CX/PR 00/14] [CX/PR 00/14-Add.1]

Priority List for Future JMPR Evaluations

The listing of new pesticides and older ones for periodic review was updated during the meeting and presented as a discussion document. [CX/PR 00/13-Add.1]

New chemicals for review during upcoming JMPR sessions are as listed below:

- 2000: chlorpropham, fipronil
- 2001: imidacloprid, spinosad
- 2002: esfenvalerate, flutolanil

- 2003: acibenzolar-S-methyl, quinclorac
- 2004: famoxadone, alpha-cypermethrin, zeta-cypermethrin

Compounds for which manufacturer support for periodic review was withdrawn included chlorfenvinphos, permethrin, flucythrinate, and vamidothion.

The updated listing of tentative JMPR agendas should be available soon at: http://www.fao.org/waicent/FaoInfo/Agricult/AGP/AGPP/Pesticid.

Report on the 23rd Committee on Reference Materials (REMCO) Meeting of the International Organization for Standardization (ISO), ISO Headquarters, 15–17 May 2000, Geneva, Switzerland

Dr. Aleš Fajgelj (Quality Assurance Supervisor, International Atomic Energy Agency Laboratories, A-2444 Seibersdorf, Austria; E-mail: A.Fajgelj@iaea.org), Chairman of the IUPAC Interdivisional Working Party on Harmonization of Quality Assurance Schemes for Analytical Laboratories, has submitted the report published below. Please note that all resolutions contained therein were still undergoing final approval at press time. The resolutions are listed only by topic, and the accompanying text reflects only the author's opinion.

The Committee on Reference Materials (REMCO) of the International Organization for Standardization (ISO) was established in 1975. The aim of the committee is to carry out and encourage a broad international effort for the harmonization and promotion of certified reference materials, their production, and applications. The specific objectives of ISO REMCO are as follows:

- to establish definitions, categories, levels, and classifications of reference materials for use by ISO
- to determine the structure of related forms of reference materials
- to formulate criteria for choosing sources for mention in ISO documents (including legal aspects)
- to prepare guidelines for technical committees to use when citing reference materials in ISO documents
- to propose, as far as necessary, action to be taken on reference materials required for ISO work
- to deal with matters within the competence of the Committee—in cooperation with other organizations—and to advise the Technical Board on action to be taken

ISO REMCO has so far been structured into six task groups, which include Hierarchy, Calibration, Promotion, Accreditation, Sampling, and Transportation and Distribution of Reference Materials.

There is a traditionally strong cooperation between ISO REMCO and IUPAC–especially with IUPAC's Interdivisional Working Party for Harmonization of Quality Assurance Schemes for Analytical Laboratories. As a successor to Dr. Arthur Head in the position of IUPAC–ISO REMCO liaison person, I attended the ISO REMCO 2000 Annual Meeting. This 23rd ISO REMCO Meeting took place 15–17 May 2000 at ISO Headquarters in Geneva, Switzerland. Conclusions of this meeting are described in 20 resolutions, the most important of which are listed below:

- **Business Plan/Strategic Review of REMCO**: ISO REMCO should be the highest body dealing with technical and "political" issues related to certified reference materials (i.e., classification, regulation, certification principles, preparation of guides, etc). In recent years, other organizations have also entered this field, for example, EURACHEM and the International Laboratory Accreditation Cooperation (ILAC; Secretariat in Sydney, Australia). This fragmentation has resulted in some discrepancies in guidance documents issued by various organizations and duplication of work. To improve the situation, a strategic plan was prepared and introduced to the members.
- **New Organizational Structure of REMCO**: The number of Task Groups was reduced from six to three, and Task Groups have been renamed as the following Subcommittees: 1) International Coordination and Harmonization, 2) Technical Guidance, and 3) Classification and Education. Seven new Working Groups (WGs) were formed, including: 1) Revision of ISO Guide 35, 2) Inclusion of Guide to the Expression of Uncertainty in Measurement (GUM) in ISO Guides, 3) Categories of Certified Reference Materials (CRMs), 4) Transportation, 5) Pharmacopoeia, 6) Information Booklets, and 7) Revision of International Vocabulary of Basic and General Terms in Metrology (VIM). I was nominated chairman of the WG on categorization of Reference Materials (RMs).
- **Publication of ISO Guide 31 and ISO Guide 33**: *Contents of Certificates of Reference Materials* (ISO Guide 31) and *Uses of Certified Reference Materials* (ISO Guide 33) were accepted and will be published within a few months. Final versions can be obtained from the ISO Central Secretariat. Unfortunately, because publication of both these guides was delayed for almost two years, new revisions, needed to bring them into accord with the latest version of ISO Guide 34 and a new ISO Guide 35, will be required soon.
- **Publication of ISO Guide 34**: *Quality System Requirements for Reference Materials Producers* (ISO Guide 34) was just published. Although it was origi-

nally planned that there would be only one such document, ILAC has published a similar guide (ILAC Guide 12). Thus, a difference in classification of reference materials exists and should be resolved between ISO and ILAC.

- **Consistency between ISO Guides and GUM**: The ISO Guide *Expression of Uncertainty in Measurement* (Geneva, 1995) has, in the last few years, influenced almost all fields of analytical chemistry. The requirement of ISO Standard 17025 that analytical results need to be reported together with their associated measurement uncertainty also strongly underpins ISO REMCO's new *Certification of Reference Materials–General and Statistical Principles* (ISO Guide 35). This viewpoint is understandable, because RMs are often applied in field laboratories for quantification of combined uncertainty or separate sources of measurement uncertainty. At the moment, revision of ISO Guide 35 is around 50% complete. Its publication is not to be expected before summer 2001. ISO Guide 35 is also a basis for future classification of RMs. However, the principles of the new guide are clear, and they will, to a certain extent, influence all reference materials producers dealing with matrix RMs. Principles of ISO Guide 35 include the following:
  1. Characterization of the candidate material through large international laboratory comparisons, which normally results in a consensus value, is no longer regarded as appropriate. Comparison of results from a small number of laboratories is preferred; however, all participants must demonstrate traceability of their results and report their measurement uncertainty.
  2. When a number of laboratories participate, as described at the beginning of paragraph 1, the results should be treated in the same way as if they were produced by a single laboratory. Statistics applied in combining these results and their uncertainties does not break a traceability chain when each laboratory separately reports traceable results. At the same time, a small number of participants can better communicate to clarify eventual discrepancies, and the entire certification project can be processed faster. Exclusion of outliers on the basis of statistics alone is not allowed. Unfortunately, in large worldwide intercomparisons, it is almost impossible to control and to achieve these requirements.
  3. In preparing the revised ISO Guide 35, no distinction will be made between "primary" methods of measurement and "other" methods. There is a common requirement that methods applied for CRM characterization are "fit for purpose" and that measurement uncertainty is as small as reasonably achievable. These decisions were based partially on the latest developments at the Consultative Committee on Amount of Substance (CCQM) at BIPM, Sevres, France (see report on page 163). CCQM has recognized that methods of analysis cannot be declared as traceable as methods *per se*. Rather, a combination of analyte, measurand, matrix, and technique is important. For various analytical techniques, the ability to produce results that are "fit for purpose" has already been demonstrated, although not declared as "primary".
- **Similarities and Differences between Materials Used in Measurement Processes**: Several different types of materials are used in measurement processes (e.g., CRMs, RMs, proficiency-testing materials, internal quality control samples, calibration standards, etc.). A clear distinction between them, based on the quality requirements for these materials and their intended use, has to be made. The first draft of a paper on this topic was expected by the end of this year. As the topic also concerns chemical terminology, strong cooperation with IUPAC is foreseen. The result of IUPAC Project 501/9/97, "Compilation and clarification of quality assurance-related nomenclature" and Alphabetical Index of Defined Terms and Where They Can Be Found, prepared by Mr. David Holcombe and published in three parts in *Accreditation and Quality Assurance* [see *Accred. Qual. Assur*. **4**, No. 12, pp. 525–530 (1999); **5**, No. 2, pp. 77–82 (2000); and **5**, No. 4, pp. 159–164 (2000)] will serve as a starting point. For a summary of the project and links to the abstracts of the *Accred. Qual. Assur*. articles, please visit the IUPAC web site at www.iupac.org/divisions/current_projects/1997/501_9_97.html.

The next two ISO REMCO Meetings are planned to take place at the National Institute of Standards and Technology (NIST), Gaithersburg, Maryland, USA, 21–23 May 2001 in conjunction with the 100th anniversary of NIST; and in Ljubljana, Slovenia in May 2002, respectively.

Overview of the International Symposium on Atmospheric Deposition and its Impact on Ecosystems, with Reference to the Mideast Region, Tel Aviv, Israel, 4–5 June 2000

Prof. René E. Van Grieken (Departement Scheikunde, Universitaire Instelling Antwerpen, Universiteitsplein 1, B-2610 Antwerpen [Wilrijk], Belgium; E-mail: vgrieken@uia.ua.ac.be), a National Representative on

IUPAC's Chemistry and the Environment Division's Commission on Atmospheric Chemistry (VI.2), and Dr. Yehuda Shevah (TAHAL Consulting Eng., Ltd., 54 Ibn Gvirol Street, POB 11170, Tel Aviv 61111, Israel; E-mail: tahalcmp@netvision.net.il), Chairman of IUPAC's Commission on Soil and Water Chemistry (VI.3), have submitted the following report:

Introduction

Atmospheric supplies of nitrogen and phosphorus, heavy metals, polychlorinated biphenyls (PCBs), chlorinated pesticides, and other persistent organic pollutants (POPs) may play a major role in ecosystem dynamics, particularly in oligotrophic marine areas such as the Southeast Mediterranean, in terrestrial ecosystems, and in inland freshwater bodies. The interface between the atmosphere and the sea plays a central role in the exchange of matter. Trace elements, such as lead, cadmium, and mercury, enter the sea to a considerable extent via the atmospheric pathway. Over 50% of the nitrogen input to the North Sea may be supplied by the atmosphere, with most of this amount being derived from anthropogenic sources. In estuaries and seas, extra nutrients can cause eutrophication, with enhanced growth of algae populations, and subsequent oxygen deficiency when the dead algae material decomposes.

Hundreds of lakes and streams can no longer sustain life, while the threat to forests and watersheds in many parts of the world is growing. In Israel, the freshwater Sea of Galilee—providing 35% of the water supply—is now showing a very unstable quality. It is likely that the dustfall, which can amount to 60% of the total solid input into the lake, may exert a profound influence on the properties and behavior of the lake in general and on the water quality in particular. In the Dead Sea area, ozone depletion was reported to coincide with an interaction of atmospheric oxidants with bromide at the Dead Sea salt pans.

In view of the growing threat of atmospheric deposition and the increasing need to expand our knowledge in the field, an International Symposium on Atmospheric Deposition and Its Impact on Ecosystems was convened 4–5 June 2000 in Tel Aviv, Israel. The symposium, organized by IUPAC's Division of Environmental Chemistry and by the Israel Chemical Society, brought together about 70 internationally recognized experts from the United States, Europe, the Mediterranean Region, and Israel.

Symposium Issues

- Atmospheric processes related to the Mideast Region as a zone in which air mass trajectories can trace both local pollution and the influence of Europe and the Sahara as sources.
- Effects of the large efforts that have been made to reduce or control emissions to air of SO_2 and NO_x, volatile organic compounds (VOCs), and, more recently, of metals and POPs.
- Cycling of pollutants between the atmosphere and the ecosystem compartments and new developments in experimental techniques for flux measurements.
- Review of atmospheric deposition studies covering the work of the Cooperative Program for Monitoring and Evaluation of Long-Range Transmission of Air Pollutants in Europe (EMEP), the EUREKA Project on the Transport and Chemical Transformation of Environmentally Relevant Trace Constituents in the Troposphere over Europe (EUROTRAC), ASE, the Biosphere Atmosphere Exchange of Trace Gases and Aerosols (BIATEX), and interaction with regional and local studies in the Middle East.

Topics of Discussion and Main Sessions

- backward trajectories of air masses over the Mediterranean
- effects of atmospheric pollutants on the Southeast Mediterranean Region
- Saharan dust
- impact on ecosystems
- research cooperation

Wet and Dry Atmospheric Deposition

Atmospheric removal occurs by dry deposition of aerosol particles and gases, or by wet deposition in rain, fog, hail, and snow. The relative importance of these two processes varies between locations and is primarily a function of the rainfall intensity. For example, at the Northern and Western European temperate latitudes, wet deposition amounts to about half of the total atmospheric input of nitrogen to natural ecosystems.

The processes of dry deposition were described by C. Davidson to include three major steps. The first step, aerodynamic transport, carries contaminants from the free atmosphere into the relatively quiescent layer close to the surface, which can be described using the friction velocity, stability class, and other parameters pertinent to turbulent flow. The second step is boundary layer transport of contaminants across the viscous layer of air, immediately adjacent to the surface. Analogies with momentum and heat transport across boundary layers are often used to describe contaminant mass transport in the viscous layer. The third step refers to interactions of the contaminants with the surface. For gases, this step describes adsorption and absorption interactions. For particles, it is important whether they adhere to the surface or bounce off.

The processes that govern the formation of rain, the scavenging of aerosol particles both within and below clouds, and the effects of aerosol size on these processes were discussed by L. Spokes, including problems as-

sociated with the collection and determination of wet fluxes, chemical reactions occurring in rainwater and controlling the pH and the aerosol solubility, and the importance of episodic high-concentration deposition events and their effect on surface water biogeochemistry.

Long-Range Transport

The East Mediterranean Region is influenced by "European" air masses that are high in anthropogenic pollutants. This import is compounded by the scavenging of alkaline Saharan dust, which has a magnified effect on cloud physics and chemistry and, subsequently, on natural precipitation, cloud seeding, and deposition onto terrestrial and aquatic ecosystems.

Recent investigations of long-range transport of European pollutants to Israel were discussed by P. Alpert, who calculated monthly cyclonic tracks over the Mediterranean based on European Center for Medium-Range Weather Forecasts (ECMWF) data. Summer back trajectories from Tel Aviv pointed to sources spreading from Southeast Russia to Southern Europe, Spain, and North Africa. Z. Levine speculated that transported particles that pass through clouds are affected by wet chemical reactions and by physical processes, leading to the formation of dust particles coated with soluble salts such as sulfates from industrial origin or from dimethyl sulfide naturally emitted by the Mediterranean itself. Gas scavenging and subsequent liquid-phase oxidation add additional sulfate. The soluble coating of the mineral dust particles could significantly change their ability to serve as cloud condensation nuclei (CCN), causing cloud water to redistribute into larger concentrations of smaller droplets.

Sulfur-coated particles were reported by D. Rosenfeld to prevent rain droplets from forming in low clouds and, possibly, to cause lower rainfall. "Polluted" clouds are composed of much smaller droplets, without any precipitation echoes detectable by precipitation radar.

The Regional Atmospheric Modeling System (RAMS) for meteorological simulations and the Hybrid Particle and Concentration Transport (HYPACT) package for dispersion modeling were used by M. Luria to explain the transport of polluted air masses toward the coast of Israel. Specific synoptic and wind conditions over the Eastern Mediterranean govern the movement of polluted air masses toward Israel. In one case study involving aircraft measurements, prevailing northwest winds forced the pollution from Southern Europe and the Balkans into the Eastern Mediterranean coast along the 180-km flight path, significantly increasing the average measured concentrations of SO_2, NO_x, O_3, and particulate sulfate.

Short-Range Transport

W. Kordel described aerial short-range-transport for pesticides; direct spray drift occurred during application and by volatilization from the target area in the post-application phase. Pesticide concentrations in nontarget plants exceeding 10% of the actual pesticide concentration in the target plants were observed in neighboring nontarget ecozones, which may cause unintended effects on fauna and flora. Particularly for semivolatile pesticides with vapor pressures between 5 x 10^{-3} and 10^{-6} Pa, this relationship is important. The observed shelter effects of downwind hedges were low.

Ozone Depletion

Photochemistry of NO_2 is the main source of O_3 in the ground and boundary layer. L. Klasinc showed that, in Croatia, the O_3 concentration has more than doubled recently and is still rising. Vertical fluxes of O_3 and energy over a plant growth cycle in a large coniferous forest of Southwest France were reported by Lopez et al.; they indicated the effects of dry, wet, and dew conditions on O_3 deposition velocity, and the effect of stomatal conductance on increased deposition velocity during the day.

Atmospheric reactive BrO was measured, and its effect on O_3 ozone chemistry was assessed over the Dead Sea in Israel by Peleg et al., who reported a negative diurnal repeating cycle of O_3 and BrO variations, correlated with solar radiation and wind direction. During the elevated BrO events, O_3 regularly decreased from noontime levels of 50–80 ppb or higher down to 10–30 ppb and occasionally to levels below the detection limit of 5 ppb. Interaction of atmospheric oxidants with bromide at the salt pans of the Dead Sea were stipulated to be the source of BrO. The only other places where this kind of chemistry occurs are over the Arctic and Antarctic.

Trace Metals

A literature survey of published concentrations of atmospheric trace metals above the North Sea and the English Channel over the period 1971–1994 was conducted by Van Grieken et al. Of the six trace metals—Cd, Cu, Pb, Zn, Ni, and Cr—that were evaluated, Pb, Zn, and Cd showed a very strong decreasing trend with time. Similarly, a seasonal variability of atmospheric Pb concentrations over the English Channel was reported by Puskaric et al.; they indicated a decrease by about one order of magnitude over the last fifteen years and a different isotopic signature for Pb aerosols from Eastern Europe versus those originating in Western Europe. Cd, Cu, Pb, Zn, and natural elements (Al, Fe, Mn, and Cr) were also measured in dry atmospheric inputs at the coast of Israel, where mixing and dilution effects of European emissions with local emissions are taking place (Herut et al.).

Fossil fuel combustion sources and incinerators are the major sources of reactive gas phase Hg (RGM). Compared to elemental Hg°, which has a slow removal

rate from the atmosphere (low solubility in water), RGM is extremely water-soluble and efficiently removed from the atmosphere during rain events. Hg deposition studies are being conducted by Mamane et al. for Hg, RGM, and total particulate mercury (TPM) to model the Hg emission in Europe, as well as its transport and deposition on the South Baltic Sea and the Mediterranean Sea.

Organic Pollutants

Gas-phase POPs over Lake Michigan have been studied by Hornbuckle et al., who employed the Lake Michigan Mass Balance Project to identify the large summertime "plume" of gas-phase PCBs from Chicago, differentiating between short-range (higher molecular weight congeners) and long-range atmospheric transport (lower molecular weight congeners).

Nitrogen and Sulfur Compounds

Owing to the discontinued used of soft coal, emissions of SO_2 over Europe have been reduced by 55% since 1980, resulting in lower concentrations of S-components in air and precipitation. In the meantime, the emissions of NO_x, contributing to acidification and to photochemistry, remain very much the same today as in 1980, although long-term studies of nitrate concentrations in precipitation from the early 1980s to the present seem to indicate that concentrations have been falling (Schaug et al. and N.O. Jensen). It was shown that large inputs of alkaline species and a relatively high abundance of Ca and NH_4^+ cause neutralization of the acid rain. In this context, a rather neutral value of pH 6.4 in the precipitation of Ankara, Turkey was reported by Incecik.

Saharan Dust

The Saharan dust is an important component in wet deposition, accounting for approximately half of the annual deposition of Al and Fe in the Eastern Mediterranean region. Tuncel et al. showed that the dust particles are potential CCNs, an atmospheric sink for trace gases, and a major factor in the neutralization of rain acidity by $CaCO_3$. Rudich et al. further suggested that mineral particles are coated with organic compounds, which can potentially influence the hydrophilic behavior of the particles and their optical properties. Danin also speculated that airborne dust trapped in vegetation is an important factor in the amelioration of growth conditions and functions as a trap of eolian dust, thereby avoiding soil erosion. Ganor et al. showed that dustfall generated locally and dust storms originating in North Africa are deposited over the Sea of Galilee in Israel. Calcite, quartz, feldspar, dolomite—and, to a lesser extent, gypsum and halite, and clay minerals, such as kaolinite, illite, and palygorskite—can be as much as 60% of the total solid input into the lake.

Conclusions

The symposium and the associated discussions focused on the issue of atmospheric deposition and its impact on ecosystems and highlighted ongoing research and problems that still need monitoring. The symposium provided the scientific basis for effective emission, mitigation, and adaptation policies, emphasizing the:

- numerous sources of polluting emissions;
- chemical transformation processes of pollutants in the atmosphere;
- relationship between sources and effects, which is not always easy to establish;
- deficiency of point measurements, which are not sufficient to characterize air quality in a particular region because the information about transport or atmospheric chemistry is missing; and
- need for integration of atmospheric pollutant concentrations and deposition, which are intricately related and need to be studied together.

The symposium also emphasized the need for:

- improving the knowledge of cause–effect relationships between air pollution and factors affecting conditions and health of ecosystems,
- improving prediction and detection,
- better ways of monitoring the environment,
- international standards for measuring and reporting emissions, and
- necessary regional and international cooperation.

These issues are of a global dimension, and regional and international coordination is highly essential. Therefore, the role of conventions, for example, the Helsinki Commission (HELCOM) for the Baltic Sea, the Oslo and Paris Commission (OSPAR) for the North Sea and Northeast Atlantic, the Barcelona Convention for the Mediterranean, and the UNDP Regional Seas Program, should be strengthened, as well as the institutions involved in measurement of air and precipitation quality and database formation, such as the Norwegian Institute for Air Research (NILU).

Acknowledgments

The authors are grateful to IUPAC and to all the contributors who made this symposium a successful event.

Epilogue: Coding Scheme for Properties in Laboratory Medicine

Since 1995, the Committee on Nomenclature, Properties, and Units (C-NPU of IFCC and IUPAC) has published nine papers on a coding system (i.e., a structure or a framework for the pairs of codes and meanings) and a coding scheme (i.e., the pairs of codes and their meanings) for properties in laboratory medicine.

"Meanings" can be descriptions of properties that are measured or observed in laboratory medicine. These manuscripts have been published in *Pure and Applied Chemistry* (*PAC*) and elsewhere (see references in articles cited just ahead), and recently four more papers have been published in *PAC* as Technical Reports with codes in the domains of Pharmacology and Toxicology (Vol. 72, No. 3, pp. 479–552, 2000), Clinical Microbiology (Vol. 72, No. 4, pp. 555–745, 2000), Clinical Chemistry (Vol. 72, No. 5, pp. 747–972, 2000), and Allergology (Vol. 72, No. 6, pp. 1067–1205, 2000). The codes offer unique and sufficient information about the properties and are, therefore, extremely valuable in the transfer of information among laboratories and to the end users of laboratory information. The codes make it possible to translate the data to any language automatically. So far, the meanings have been tested for translation into 18 languages, including many of the European languages, Arabic, and Cantonese.

The coding scheme comprises a total of 10 083 pairs with the international coding scheme identifier "NPU" for properties, and a further 13 379 pairs for elements. These latter pairs are for use primarily as results of taxonomic investigations; for example:

- NPU16294 Secretion(Oropharynx)—Bacterium+Fungus; taxon = ATCC12600 (*Staphylococcus aureus);* ATCC12344 (*Streptococcus pyogenes)*
- NPU04062 Urine—Benzodiazepines; taxon = CAS846-49-1(Lorazepam); CAS439-14-5(Diazepam)

In order to test the functionality, the coding scheme has been successfully mapped to the various codes that are currently used in more than 50 medical laboratories in Denmark and Sweden. To accommodate national or local needs, special codes can be used.

The domains currently covered by the IFCC/IUPAC coding scheme are Allergology, Clinical Chemistry, IOC-Prohibited Drugs, Microbiology, Pharmacology, Reproduction and Fertility, Thromboses and Hemostasis, and Trace Elements. The schemes have been prepared in collaboration with professional groups and organizations that represent the various specialities.

Coding schemes for Inborn Errors, Molecular Biology, Tissue Typing, and Transfusion Medicine are yet to be prepared .

The coding scheme is accessible at http//:www.ifcc-iupac.suite.dk; for practical application, see http://www.labinfo.dk/.

See http://www.iupac.org/projects/1987/710_18_87.html for project description and update.

Committee on Nomenclature, Properties, and Units (C-NPU) of the International Federation of Clinical Chemistry (IFCC) and Laboratory Medicine and IUPAC

In Memoriam

Kurt Leopold Loening (1924–2000)

Kurt L. Loening, the world's foremost expert and leader in chemical nomenclature, passed away at the age of 76 on 12 July 2000 in Columbus, Ohio, USA.

Dr. Loening was born in Berlin, Germany, in 1924. He also spent a few years growing up in French-speaking countries. When he came to the United States, he already had an early appreciation of languages and communications skills. He graduated from high school in New York City in 1942 and received his B.Sc. degree in chemistry from The Ohio State University (OSU) in 1944. After a tour of duty with the U.S. Army Chemical Warfare Service, he returned to OSU to pursue research in physical chemistry. He received his Ph.D. in 1951.

Dr. Loening joined Chemical Abstracts Service (CAS) in the same year. His 39-year career at CAS linked him with many of the persons who were pillars of the organization. In his early days, he worked under the tutelage of CAS Editor E. J. Crane, former Editor and consultant Austin M. Patterson, and Associate Editor Leonard T. Capell. His primary mentor was W. Russell Stemen. In 1964, Dr. Loening succeeded Capell as Director of Nomenclature at CAS, a post he held until his retirement in 1990. His early contribution to the development and application of chemical nomenclature to the Chemical Abstracts (CA) Volume and Collective Indexes was a thorough documentation of CAS naming and indexing policies, of which the present Appendix IV of the CA Index Guide is a direct descendant.

Outside CAS, he served for 25 years as chairman of the American Chemical Society (ACS) Committee on Nomenclature. He also participated in the work of all of the IUPAC Nomenclature Commissions. His most enduring contributions were the reconstitution of the

IUPAC Commission on Macromolecular Nomenclature (IV.1), which he chaired for 11 years (1968–1977), and the founding of the IUPAC Interdivisional Committee on Nomenclature and Symbols (IDCNS), which he guided for another 11 years (1976–1987). The former produced pioneering documents dealing with nomenclature of polymers, and the latter assured conformity of all the IUPAC publications with the approved standards by establishing a publication procedure that allowed public comment before official approval of recommendations by IUPAC. He also served as a Member of the IUPAC Commission on the Nomenclature of Organic Chemistry (III.1) from 1963–1983, a Member of the IUBMB-IUPAC Joint Commission on Biochemical Nomenclature (JCBN) from 1977–1985, and a Member of the IUPAC Commission on Microchemical Techniques and Trace Analysis (V.2) Subcommittee on Surface Analysis from 1987–1991.

Dr. Loening lectured and published widely, with work ranging from articles in journals to chapters in books and encyclopedias. His nomenclature and terminology topics covered all fields of chemistry, including history. In national and international circles, he was known for his patience and ability to reconcile differences of opinion among chemists of many nations and to forge consensus on sensitive nomenclature issues.

He did not hesitate to tackle controversial subjects such as recommending an 18-column Periodic Table of Elements, which is now an accepted standard worldwide, or criticizing some of the more recent decisions of the IUPAC Commissions.

When asked what he considered the highlight of his career, he answered that it was the opportunity to help chemists solve their nomenclature problems. He had often compared chemical nomenclature with linguistics, and was just as concerned as linguists are about the precision and specificity of expressions to avoid potential misunderstandings.

In 1987, Dr. Loening received the prestigious Patterson-Crane Award of the ACS Columbus and Dayton Local Sections for work in the documentation of chemistry in the development of chemical nomenclature and terminology. He was also a recipient in 1990 of the ACS Executive Director's Award for his many years of distinguished service to the ACS. He was elected a Fellow of the American Association for the Advancement of Science (AAAS).

In the decade following his retirement, he did not rest on his laurels. He founded, with Helmi Sonneveld of the Netherlands, a terminology consulting firm, Topterm, and was the Managing Director of its North American Division. He was a cofounder and a coeditor of the journal *Terminology*. For that achievement, he received in 1997 the A. A. Reformatskii Prize of the

Dr. Kurt L. Loening

Scientific Board of the Russian Terminological Society (RossTerm).

He traveled widely and was consulted by industrial companies, national and international government agencies, professional associations, and countless individuals worldwide. He served as a consultant to the WHO International Nonproprietary Names program, to the U.S. Adopted Names Council (USAN), and to the U.S. Pharmacopeial Convention. He was frequently asked to be an expert witness in matters involving legal litigation related to terminology and nomenclature.

Dr. Loening also held a post of Senior Research Associate in the Department of Chemistry of The Ohio State University, where now The Kurt Loening Endowment Fund in Chemical Nomenclature and Chemical Information has been established.

Outside purely scientific pursuits, he was involved in harness racing for many years as a horse owner. Nothing gave him a greater pleasure than occasionally winning the purse. His horse, Good Lover, was the Ohio Sire's Stakes Champion for three-year old pacers in 1991.

Kurt Loening will be greatly missed by many around the world.

Dr. W. V. Metanomski
Secretary, IUPAC Interdivisional Committee on Nomenclature and Symbols (IDCNS)

New Projects

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

Soil and Water Bioremediation: *In-Situ* Treatment of Polluted Soil and Water with Emphasis on the Use of Genetically Engineered Microorganisms

IUPAC has approved a project to prepare a critical review of the state-of-the-art of the removal of hazardous chemical contaminants from liquid, solid, and gas phases using biological processes, including bioremediation of leachates, toxic industrial wastewater, soils, and sediments. Emphasis will be placed on novel application of genetically engineered microorganisms for bioremediation. Comments from the chemistry and environmental community are welcome and should be addressed to the project coordinator, Dr. Raphi Mandelbaum, LDD Technologies, POB 3506, Petach Tiqva, Israel 49130, Tel.: +972 3 937 3740; Fax: +972 3 937 3770; E-mail: rm.ldd@neopharm-ltd.co.il.

See http://www.iupac.org/projects/2000/990132_600_00.html for project description and update.

News and Notices from Other Societies and Unions

Formulating International Ethical Guidelines for Science (ICSU-SCRES)

Dr. Kathinka Evers (Postbox 522 Sentrum, 0105 Oslo, Norway; Tel.: +47 23 31 83 17; Fax: +47 23 31 83 01; E-mail: evers@online.no), Exceutive Director of the Standing Committee on Responsibility and Ethics in Science (SCRES) recently established by the International Council of Scientific Unions (ICSU), has contributed the following article, along with a request for comments on it to be sent to her in English, French, German, Spanish, Swedish, Danish, or Norwegian. A more complete description of this new ICSU-SCRES project was presented as a background paper for the World Science Conference held 26 June–1 July 1999 in Budapest, Hungary and recently published in *Science and Engineering Ethics* **6**, 131–142 (2000).

SCRES focuses part of its present activities on *the possibility of formulating international ethical guidelines regulating scientific research.* Ethical guidelines have been formulated to regulate activities within various scientific disciplines, and some of these go beyond the national perspective (e.g., the ban on human experimentation without informed consent). Ethics in science has gained increasing relevance in the past decades when the development of science has been very rapid, and traditional values and familiar moral intuitions appear threatened by some discoveries, as the heated debate around, for example, mammal cloning illustrates. Understanding of this development is limited to a select minority, which raises questions of how best to spread scientific education. The public perception of science has deteriorated dramatically in recent decades, and we need to develop an instrument to promote public trust in science. Modern science and technology exert strong influence on the world's development, a power that can be dangerous unless restrained by principles or guidelines. Calls for international guidelines regulating scientific research on a global front have become more frequent, for example, concerning socioeconomic development, sustainability of natural resources, world peace, quality of life, equity among nations, handling of scientific data, or problems in cyberspace.

The question is: Given the plurality that reigns within ethics as a result of different cultural backgrounds, political or financial systems, religious or other ideologies, levels of development, socioeconomic systems, etc., is it possible to find international norms that combine broad acceptance with substance in their formulation? The institutions of science may provide a context for eliciting norms–this pluralism notwithstanding. Assuming that this convergence is, in principle, possible and sufficiently realistic to be a worthwhile pursuit, in which scientific contexts might such guidelines be desirable? A few have been mentioned, but there are others.

The object under analysis would be a group of related concepts: codes of *conduct, guidelines, oaths,* and *pledges,* notably. The primary concept is the guideline or code. An oath or a pledge makes appeal to a principle that must be universalizable, for example, applicable to all individuals in relevantly similar circumstances. This principle (or a cluster of them) constitutes the code or the guideline that can—but need not—be expressed in a ceremony where the individual swears to follow its dictate. Oaths are, therefore, conceptually secondary to codes. Some call for an oath for scientists to be developed, because they feel that the ceremony might serve to make individuals more aware of the ethical principles to which the oath (or the pledge) would appeal. Others are worried that this practice can make ethics seem optional, for an oath concerns only those who swear it. This situation might perhaps be avoided if all members of a given group are obliged to swear

the oath in order to enter that "society of honor". The objection has then been raised that this image is antiquated. The primary task from SCRES's point of view is to analyze actual or possible codes and guidelines. A discussion whether to express them in an oath or a pledge may follow but cannot precede that task. It should be noted that any pledge for science must be a part of a larger social-political dialogue.

The subjects concerned are the individual scientists, but also scientific institutions—academies, unions, associations, etc. When a code is binding for a given group, it articulates a *cooperative practice* for all the members of that group. This practice may relate to individual moral qualities (such as honesty, conscientiousness, and integrity) or to the group's social relationship (e.g., to the state, or to bodies providing or offering financial support). (The group may assert social duties, political neutrality, and incorruptible academic freedom, or its codes may require a different approach). Generally, it is important to distinguish between individual and communal perspectives. Clearly, the individual scientist cannot be held responsible for any and all applications of her or his research in a broader communal context. There is an equilibrium to be found between individual and communal responsibility. Furthermore, the individual scientist acts in a variety of roles that need to be distinguished, for each carries different (not necessarily compatible) responsibilities, and the relevant codes of conduct will vary accordingly. In particular, we may note the difference between the scientist *qua* researcher, author of reports, social consultant, political tool or advisor, and advocate/witness.

Within a national perspective, the relationships between ethical codes for science and, for example, educational strategies and laws are relevant to establish. In international contexts, this exercise is equally important, but considerably more difficult. Already within Europe there are profound cultural disparities in the attitudes toward "acceptable" behavior in science, and these differences appear to deepen when distinct continents are compared. Nevertheless, there seems to be a need for international agreements in many ethical issues, such as socioeconomic development, sustainability of natural resources, world peace, quality of life, equity among nations, handling of scientific data, or problems in cyberspace. It is, therefore, worthwhile to investigate if we can find a "smallest common denominator" that might form a foundation for international agreement. In this context, it will be of interest to draw comparisons to the declaratory tradition in international law and to the UN Charter.

New Books and Publications

New Publications from the World Health Organization

Quality Assurance of Pharmaceuticals: A Compendium of Guidelines and Related Materials, Volume 2: Good Manufacturing Practices and Inspection

1999, v + 196 pages (available in English; French in preparation), ISBN 92-4-154526-7, CHF 62.-/USD 55.80; In developing countries: CHF 43.40, Order No. 1152452. WHO Marketing and Dissemination, CH-1211 Geneva 27, Switzerland; E-mail: bookorders@who.ch; Tel.: +41 22 791 24 76; Fax: +41 22 791 48 57.

This book draws together 12 WHO guidelines related to good manufacturing practices (GMP) and to the inspection of pharmaceutical manufacturers and drug distribution channels. Most of these guidelines have appeared as annexes in various reports of the WHO *Expert Committee on Specifications for Pharmaceutical Preparations.* By making these guidelines available in a single reference work, the book facilitates access to the complete body of WHO guidelines and recommendations aimed at ensuring that pharmaceutical products are manufactured in compliance with internationally accepted standards for quality and safety.

Guidelines are presented in four chapters. Chapter 1 reproduces the core GMP guidelines, which set out the philosophy and essential elements of GMP and define good practices in production and quality control. Guidelines for the validation of manufacturing processes explain and promote the concept of validation embedded in the core GMP texts. The guidelines can also be used to establish priorities and select approaches when a validation program is being developed. Chapter 1 concludes with an explanatory text describing the role, functions, and training of the person authorized to release batches of finished products for sale.

The two guidelines in the next chapter, on starting materials, provide GMP for active pharmaceutical ingredients and for the manufacture of pharmaceutical excipients. As strict application of full GMP is not always practical or necessary for starting materials, these guidelines outline the procedures and practices that manufacturers should employ to ensure that the methods, facilities, and controls used for their production are operated or managed so that phamaceutical starting materials have the quality and purity appropriate for use in finished pharmaceutical products.

Chapter 3 reproduces four sets of specialized guidelines for specific pharmaceutical products. Guidelines for sterile pharmaceutical products cover the additional steps necessary to minimize the risks of microbiological, particulate, and pyrogen contamination in sterile products. The second guidelines set out GMP for the special case of products manufactured with biological materials and processes. GMP for investigational products specifically address those manufacturing practices that may be different, given the fact that investigational products for clinical trials in humans are not usually manufactured in accordance with a set routine, and may be incompletely characterized during the initial stages of clinical development. Chapter 3 concludes with GMP for the manufacture of herbal medicinal products, giving particular attention to procedures and techniques that are substantially different from those employed in the manufacture and quality control of conventional products.

The final chapter includes provisional guidelines for the inspection of pharmaceutical manufacturing facilities, aimed at enforcing GMP compliance, and guidelines for the inspection of drug distribution channels, aimed at ensuring that drug quality is maintained throughout the pharmaceutical supply system or distribution network.

WHO Expert Committee on Biological Standardization, 48th Report, Technical Report Series No. 889

1999, vi + 111 pages (available in English; French and Spanish in preparation), ISBN 92-4-120889-9, CHF 23.-/USD 20.70; In developing countries: CHF 16.10, Order No. 1100889.

This report presents the recommendations of a WHO expert committee commissioned to coordinate a range of research and other activities needed to assure the purity, potency, safety, and stability of biological products used in medicine. Work includes the development and adoption of detailed requirements for the manufacturing, licensing, and control of vaccines and other biologicals. The committee also coordinates the establishment of international reference materials for measuring the potency and other characteristics of biological products. These reference materials are used worldwide and play a crucial role in ensuring the comparability of products on a global basis.

The report has four parts. The first provides a brief discussion of general issues that shape the committee's work. Issues discussed include progress in the establishment of cytokine standards, efforts to harmonize technical requirements for vaccine production and licensing, implications for vaccine requirements of the Agreement on Technical Barriers to Trade of the World Trade Organization (WTO), and safety questions arising from the detection by very sensitive polymerase chain-reaction-based methods of low levels of reverse transcriptase activity in live viral vaccines prepared in chicken cells.

The second part provides a brief review of the status of some 15 international guidelines, requirements, and related documents relevant to the manufacture and quality control of biologicals. Part 3 summarizes activities relating to the status and development of biological reference materials for various antibodies, antibiotics, blood products and related substances, cytokines and growth factors, and other substances requiring international reference materials.

The fourth and most extensive part issues detailed guidelines for the production and control of synthetic peptide vaccines, requirements for tick-borne encephalitis vaccine (inactivated), and guidelines for thromboplastins and plasma used to control oral anticoagulant therapy. Also included are an amendment to the requirements for hepatitis B vaccine made by recombinant DNA techniques, and a report on the standardization and calibration of cytokine immunoassays.

Health Effects of Interactions between Tobacco Use and Exposure to Other Agents, Environmental Health Criteria No. 211

1999, xx + 149 pages (English, with summaries in French and Spanish), ISBN 9- 4-157211-6, CHF 36.-/USD 32.40; In developing countries: CHF 25.20, Order No. 1160211.

This book evaluates the findings of close to 600 studies aimed at determining whether the health risks associated with tobacco use are enhanced by coexposure to numerous chemical, biological, and physical agents commonly found in the workplace. Coexposures in the domestic and general environment, which are especially important in newly industrializing countries, are also considered in this comprehensive review. Although all forms of tobacco use are covered, particular attention is given to risks arising from exposure to mainstream and sidestream smoke from cigarettes.

The book has four chapters. The first summarizes what is known about the health risks caused by tobacco use. A brief overview of the history of tobacco use is followed by a detailed explanation of the chemistry of processed tobacco and the many toxic compounds found in tobacco and in mainstream and sidestream smoke. The chapter also includes an overview of all documented acute and chronic adverse effects, including chronic obstructive lung disease, chronic bronchitis, small airways disease, emphysema, pulmonary fibrosis, many forms of cancer, and effects on the cardiovascular system. The chapter concludes with a review of evidence demonstrating the health hazards of smokeless tobacco.

The second and most extensive chapter evaluates the evidence on health effects caused by interactions be-

tween tobacco smoke and asbestos, nonasbestos fibers, seven inorganic chemicals, five organic chemical agents (including ethanol), four physical agents, and seven biological agents (including two widespread infectious agents). The chapter also includes an explanation of the concept of interaction and how it can be measured, a discussion of vector effects (whereby cigarettes become contaminated with toxic chemicals in the workplace), and a review of data indicating that tobacco smoking can alter the metabolism of therapeutic drugs and other chemicals.

Chapter 3 considers whether adverse effects following coexposure to tobacco smoke and other agents are separate effects or possible interactions. The evaluation draws on data from studies of coal mining, other mineral dusts, fibrous minerals, metals, pesticides, and exposure in the rubber and petroleum industries.

The report found evidence for synergism in the production of adverse effects, including cancer, between tobacco smoking and exposure to asbestos, ethanol, silica, and radiation. The report also found evidence that tobacco smoking affects the health risks of exposure in coal mining, pesticide handling, and in the rubber and petroleum industries. In addition, tobacco smoking can increase the risk of byssinosis produced by exposure to cotton dust, and nasal cancer caused by exposure to wood dusts.

On the basis of this evaluation, the final chapter concludes that all possible measures should be taken to eliminate tobacco use, particularly smoking. To avoid interaction with occupational exposure and to eliminate hazards arising from exposure to environmental tobacco smoke, the report concludes that smoking in the workplace should be prohibited. Moreover, because smoking can result in altered responses or adverse reactions to drugs and other treatments, appropriate dose adjustments and patient surveillance should be taken into consideration by clinicians.

Principles and Methods for Assessing Allergic Hypersensitization Associated with Exposure to Chemicals, Environmental Health Criteria No. 212

1999, xxix + 399 pages (English, with summaries in French and Spanish), ISBN 92-4-157212-4, CHF 84.-/ USD 75.60; In developing countries: CHF 58.80, Order No. 1160212.

This book summarizes current understanding of the complex interactions between chemicals, the immune system, and target organs that lead to manifestations of allergic hypersensitivity and autoimmunity. Noting that the incidence of allergic disorders has increased significantly in many countries, the book responds to the urgent need to improve methods for detecting potential allergens and predicting their effects in both individuals and populations. The need for better preventive strategies and therapeutic options is also considered, particularly in view of the high costs of allergic disorders in terms of health care and time lost from work.

Addressed to researchers, the book concentrates on what is known about the mechanisms of sensitization and autoimmunity elicited by numerous industrial chemicals, adjuvant environmental factors (such as air pollution, tobacco smoke, and ultraviolet radiation), and food allergens with a proven involvement of the immune system. Although a large number of allergies are covered, particular attention is given to asthma and contact dermatitis as major occupational diseases undergoing intensive investigation. Throughout, a special effort is made to identify lines of investigation that will lead to a better understanding of fundamental mechanisms and thus improve the prospects for treatment and prevention. Over 1 000 references to the literature are included.

The book opens with a detailed explanation of the structure and functional processes of the immune system, followed by a discussion of the mechanisms by which chemicals can disrupt these functions. Also discussed are fundamental concepts of immunosuppression, immunodeficiency, and immunological tolerance that help explain the mechanistic basis of sensitization, allergic responses, and autoimmunity.

Chapter 2 provides an overview of mechanisms involved in four major types of hypersensitivity and in autoimmunity. Mechanisms are illustrated with examples of diseases—from occupational asthma, through myasthenia gravis, to chronic beryllium disease—where exposure to environmental chemicals might play a role. The numerous hypotheses put forward to explain the mechanisms of autoimmune reactions are also critically assessed. Factors influencing allergenicity are covered in chapter three, which concentrates on the many complex endogenous and exogenous factors that govern the induction of allergic responses.

Against this background, Chapter 4 discusses clinical aspects of the most important allergic diseases, which include allergic contact dermatitis, atopic eczema, allergic rhinitis and conjunctivitis, allergic asthma caused by contact with chemicals, food allergy, and autoimmune diseases associated with drugs, chemicals, and environmental factors. Each disease is profiled in terms of its epidemiology, clinical manifestations, etiology, pathogenesis, diagnosis, and strategies for treatment and prevention.

The remaining chapters review the epidemiology of asthma and allergic disease (including trends over time in different geographical regions), describe procedures for hazard identification through the demonstration of allergenicity, and explain how the principles of risk assessment can be applied to allergy.

The book concludes with a glossary of terms, followed by 15 precise recommendations for the protection of human health and a list of priorities for further research.

Awards and Prizes

William Horwitz Receives Robert Boyle Medal from Royal Society of Chemistry

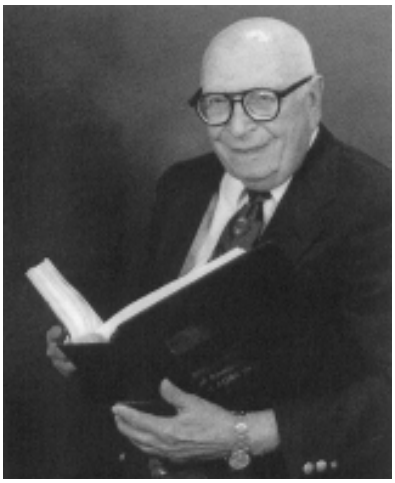
Dr. William Horwitz, current Associate Member and former U.S. National Representative on IUPAC's Commission on General Aspects of Analytical Chemistry (V.I), has received the prestigious Robert Boyle medal of the Royal Society of Chemistry. His medal citation, which appeared in the June 2000 edition of *Chemistry in Britain*, Vol. 36, No. 6, p. 62, reads as follows:

"*Distinguished for his contributions to the quality of analytical measurements and to the statistics of data treatment, including the discovery of the Horwitz function, which relates the reproducibility of such measurements to analyte concentrations*".

Bill Horwitz's luminous career as a leading analytical chemist was summarized in the *Chemistry in Britain* article in the following words:

William Horwitz is the scientific adviser to the Office of Special Research Skills at the Center for Food and Applied Nutrition of the U.S. Food and Drug Administration (FDA) in Washington, DC. He received his first degree from the University of Chicago and his Ph.D. from the University of Minnesota. He has spent his entire professional career of over 57 years with the FDA, beginning as a chemist, then as chief chemist of the Minneapolis laboratory. After being transferred to Washington, he directed laboratory investigations on various aspects of analytical food chemistry and advised on the application of analytical chemistry to the regulation of foods and drugs. [*Editor's Note*: Dr. Horwitz joined the FDA in Minneapolis in 1939 and retired from the FDA in Washington, DC on 30 June 2000.]

He was executive director of the Association of Official Analytical Chemists (now AOAC International) for 28 years and editor of six editions of its *Official Methods of Analysis*. He is the U.S. delegate to the FAO/WHO Codex Committee on Methods of Analysis and Sampling and is a member or adviser to several other Codex committees. He was also chairman of the U S. Technical Advisory Group to the International Standardization Organization (ISO), Technical Committee 34, on Agricultural Food Products. He was an abstractor and section editor of *Foods* for *Chemical Abstracts* for over 40 years. He has received several awards from the U.S. Department of Health and Human Services, including their superior and distinguished service awards and the Harvey W. Wiley award of AOAC International.



Dr. William Horwitz

In 1995, AOAC International established the William Horwitz award, of which Dr. Horwitz was the first recipient. He is the author of over 140 papers on various aspects of analytical food and drug chemistry and the reliability of chemical analysis, and he has lectured on these subjects at many universities and to chemical societies from Australia to Israel.

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*.

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 *Chemistry International* **17**, 141 (1997).

Macromolecular Division. Commission on Macromolecular Nomenclature—Definitions Relating to Stereochemically Asymmetric Polymerizations
<http://www.iupac.org/reports/provisional/abstract00/baron_300401.html>

Asymmetric polymerization has been the interest of many academic and industrial polymer scientists, but no reference has been made by IUPAC explicitly to definitions of reactions involving the asymmetric synthesis of polymers. Hence, this document presents definitions concerned with asymmetric and related polymerizations, with examples included to clarify the meaning of the definitions. Asymmetric polymerizations embrace two main categories, "asymmetric chirogenic polymerizations" and "asymmetric enantiomer-differentiating polymerizations".

Comments by 30 April 2001 to Prof. Maximo Baron, Catedra de Fisica, Facultad de Ciencias Exactas y Naturales, Universidad de Belgrano, Villanueva 1324, 1426 Buenos Aires, Argentina. Tel.: +54 11 4511 4700; Fax: +54 11 4821 4887; E-mail: baron@ub.edu.ar.

Reports from Commissions and Division Committees

Chemistry and Human Health Division Committee

Summary of Minutes of Division Committee Meeting at IUPAC General Assembly, Berlin, Germany, 10 August 1999

Division President Prof. Camille-Georges Wermuth chaired the meeting and welcomed the 13 participants, comprising members of the Sections of Medicinal Chemistry and Clinical Chemistry and their commissions.

Recent discussions and decisions that had taken place during the General Assembly (GA) meetings in Berlin—especially the strategic plan to restructure IUPAC—were discussed, including the new project evaluation process. Main criteria of the evaluation will be usefulness according to the strategic plan, improvement of the image of IUPAC, and maintenance of a high scientific standard.

Deliberations during the GA yielded several new projects within the Division, which should be submitted at the earliest convenience and completed within the next two years.

The Section on Medicinal Chemistry presented the following projects:

- "Natural and unnatural substances". This publication addresses scientists, laymen, and the press. It is intended to make the public more aware of the similarities between natural and synthetic compounds and the health risks associated with natural and herbal remedies, vitamins, nutrients, etc.
- "Database of drug metabolites for individualized drug treatment". This project involves cooperation with ICSU and coordination by IUPHAR.
- "Compendium of glossaries" and "Compendium of nutraceuticals" (Coordinator, Dr. Mukund S. Chorghade).

The Section on Clinical Chemistry discussed the following proposals:

- "Recommendation on nanotechnology in the clinical laboratory".
- "Recommendations on quality management, practices, and procedures for decentralized clinical measurements".
- "Database on chemical disasters and hazards. Measurements and markers in exposed people as part of a global network". This database shall serve as an ongoing reporting system for detection, identification, and monitoring of the effects of industrial chemical waste on human health. The project is to provide recommendations for procedures to be used for collection and analysis of samples and reporting of the impact of studies. It should be developed in association with WHO.

The Commission on Nomenclature, Properties, and Units (VII.C.1) has eight ongoing projects to be finished before 2001 and proposed three new projects. The Commission on Toxicology (VII C.2) will continue with three ongoing projects and presented proposals for seven new projects, which have been generated during this GA, partly through interdivisional discussions.

President Prof. Wermuth called for early distribution of project applications and emphasized the need for new input and activities and projects directed toward chemistry and human health. According to the IUPAC strategic plan, most of the commissions will be dissolved and the work will be done by project teams, with extra input and expertise from outside of IUPAC. Some commissions, however, may continue; the Commission on Nomenclature, Properties, and Units might be a candidate. Decisions will be made in 2001; until then, ongoing projects will continue under the old system, and new ones will be initiated under the new system. It was agreed to maintain the working structure of the Division, with two sections and the existing com-

missions, but to integrate the disciplines more into the future global structure of the Division of Chemistry and Human Health. The positions of president and secretary for the Sections and Commissions were filled, but four positions for Titular Members (TM) were left open for new members in order to broaden the aspects of chemistry and human health beyond medicinal and clinical chemistry and to encourage input from other fields related to human health.

A subsequent Division Meeting was held in Brussels, 10–11 March 2000.

Birger Heinzow
Secretary, IUPAC Chemistry and Human Health Division Committee

Commission on Toxicology—VII.C.2

Summary of Minutes of Commission Meeting at IUPAC General Assembly, Berlin, Germany, 8–10 August 1999

Eleven members of the Commission on Toxicology (VII.C.2) met for three days during the 40th General Assembly in Berlin.

Reports were given by Chairman Dr. John H. Duffus and by members of the commission who served on the scientific advisory committees of the following IUPAC-sponsored scientific meetings and proceedings: 1st International Conference on Trace Element Speciation in Biomedical, Nutritional, and Environmental Sciences (4–7 May 1998, Munich, Germany); 5th International Symposium on Metal Ions (Munich, Germany); and 15th International Conference on Chemical Education (9–14 August 1998; the first in Africa, during which a presentation on the Curriculum on Toxicology was given as part of the Clinical Chemistry Symposium). A short report on the Cairo Conference Symposium, "Tertiary Vocational Training in Chemistry Related to Health Care", prepared by Dr. Howard G. J. Worth, has been published in *Chemistry International*, Vol. 20, No. 6, pp. 171–172, 1998.

The ongoing projects "Biological Monitoring for Exposure to VOCs" (IUPAC Recommendations 2000, *Pure and Applied Chemistry*, Vol. 72, No. 3, pp. 385–436, 2000), "Exposure Assessment and Decision Rules in Compliance Testing for Implementation of Exposure Limits", "Exposure Assessment Using the Logbook Method", "Risk Assessment Methodology", "Educational Material", and "Modeling Outdoor Exposure and Risk Assessment of Particulate Matter" are most likely to be completed by 2001.

As a joint project agreed with the Committee on Teaching of Chemistry (CTC) at the General Assembly in Geneva in 1997 and previously discussed in Cairo in 1998, Dr. Duffus has prepared a draft of "Toxicology: An Introduction" for use as a resource in school chemistry courses. The final version has been circulated within the CTC and Commission VII.C.2 and was discussed during a joint meeting with the CTC in Berlin. About 120 pages of educational material will be made available to download from the Internet, possibly from a Commission VII.C.2 web site, as a PowerPoint presentation that can easily be adapted to other languages. The material aims at courses on an introductory level (e.g., teaching at high schools) and might be especially useful for developing countries. From the discussion with the CTC, the need for a hard copy version was expressed, with the addition of case studies, (e.g., current cases of public concern). Material for a toxicology course is already available via the Internet at http://www.med.ed.ac.uk/hew/tox/default.htm.

Cooperation with the International Program on Chemical Safety (IPCS) will continue, as outlined at the 1997 meeting in Geneva with Dr. Mercier. An advanced toxicology textbook for schools is in the process of publication by IPCS following a review stage. Further cooperation with Commission VII.C.2 is appreciated by IPCS; the "IUPAC Glossary on Terms in Toxicology" has been used in the Organization for Economic Cooperation and Development (OECD) and IPCS project on risk assessment harmonization.

Dr. Duffus represented IUPAC as an observer at the IPCS Program Advisory Meeting in Berlin, 5–8 October 1998 (see *Chemistry International*, Vol. 22, No. 1, pp. 7–10, 2000). He also became a member of a team convened by the European Regional Office of WHO to harmonize environmental health terms used in papers prepared for the meeting of European Ministers of Health and Environment in London in 1999.

Dr. Duffus has been contacted about an interface session during the World Conference of IUTOX with participation by Commission VII.C.2. From the suggested topics, exposure assessment was regarded as most appropriate. A proposal for a half-day symposium consisting of four lectures and a joint chair (IUTOX + IUPAC) was formulated.

The Commission discussed the new system to be implemented by IUPAC, with regard to the effect of its future project-driven structure and function on possible new Commission VII.C.2 projects. The need for new input and activities and projects directed toward chemistry and human health was emphasized.

Commission VII C.2 will continue with three ongoing projects and presented proposals for seven new projects, which have been generated during the General Assembly in Berlin, partly through interdivisional

discussions. The seven new projects are listed below:

- Criteria for assessment and quality assurance of material to be presented on the Internet under the auspices of IUPAC. CTC and the Committee on Printed and Electronic Publications (CPEP) are suggested coordinators. (Project proposal by Dr. Duffus)
- Exposure assessment. IUPAC minisymposium within the 9th IUTOX Conference in Brisbane, 8–13 July 2001 (Coordinator: Dr. Duffus).
- Educational material for teaching chemistry related to case studies for risk assessment in toxicology. Senior high school level, in addition to the ongoing project "Toxicology: An Introduction" (Coordinator: Dr. Duffus; joint project with CTC).
- Modeling human exposure in the workplace (Coordinator: Dr. Erik Olsen).
- Exposure assessment for neurochemically active metals/manganese species (Coordinator: Dr. Jytte M. Christensen; participants: Prof. Douglas M. Templeton, Ingvar Thomassen, Dr. Erik Olsen, Harry Roels).
- Immunochemistry in metal exposure, possibly with a focus on nickel and beryllium (Coordinator: Prof. Douglas M. Templeton; participants: Dr. Regine Heinrich-Ramm and Dr. Jytte Molin Christensen).
- Conference on risk assessment of particulate matter, with a focus on fibers. The proceedings will be published as a monograph (Coordinator: Prof. R. P. Nolan).

Dr. Duffus will continue as chairman, Prof. Douglas M. Templeton will become secretary, and Dr. Erik Olsen and Prof. Monica Nordberg are new Titular Members. Dr. Birger Heinzow became secretary of the Division. Prof. Dr. Laszlo Nagymajényi and Dr. Jytte Molin Christensen will be new Associate Members. New associate members will be contacted by the secretary, informed about ongoing activities, and invited to join existing projects and to generate and propose new projects.

The Commission met again 28 September–1 October 2000 in Szeged, Hungary.

Birger Heinzow
Secretary, IUPAC Commission on Toxicology
VII.C.2

Conference Announcements

 *designates IUPAC sponsorship.*

6th Rio Symposium on Atomic Spectrometry, 3–9 December 2000, Pucon, Chile

Part I of this meeting will comprise a scientific program of plenary lectures, short oral presentations, and posters on atomic absorption, optical emission, atomic fluorescence, and inductively coupled plasma (ICP)-mass spectrometry. Specific topics will include the following:

- instrumentation developments
- new method developments
- vapor generation techniques
- sample preparation and pretreatment
- preconcentration
- sample introduction
- solid and slurry sampling
- interferences, their mechanisms and their prevention
- flow injection and miniaturization
- elemental speciation analysis
- quality assurance
- chemometrics in atomic spectroscopy
- applications in environmental, industrial, clinical, toxicological, biochemical, food, drug, agricultural, hydrological, geological, mineralogical, metallurgical, and petrochemical samples; in process control and analysis; and in high-purity materials.

Part II of the symposium will consist of a workshop on fundamental studies and instrumental developments in electrothermal atomic absorption spectrometry, electrothermal vaporization, inductively coupled plasma, and optical emission and mass spectrometry, presented as research papers in invited lectures and short oral presentations.

For further information, contact the Coordinator, Prof. Dr. Carlos G. Bruhn, Departamento de Analisis Instrumental, Facultad de Farmacia, Universidad de Concepcion, P.O. Box 237, Concepcion, Chile; E-mail: cbruhn@udec.cl; Tel.: +56 41 204252; Fax: +56 41 231903; Web site: http://www.udec.cl/6riosymp/.

6th International Conference on Solar Energy and Applied Photochemistry, 3–8 April 2001, Cairo, Egypt

This conference and an associated workshop aim to provide a means of communication between scientists in different academic disciplines who share a common

interest in the fundamental and technological aspects of the electronic excited state of different systems. It will focus on research among the chemistry, physics, engineering, optics, electronics, materials science, biological, pharmaceutical, and medical communities.

The conference and its satellite training workshop will cover fundamental and applied aspects of the following topics:

- photochemistry and photophysics relevant to nanoscale and supramolecular science and technology
- analytical applications of fluorescence, bioluminescence, and chemiluminescence
- photobiology, photostability of drugs, and photodynamic therapy
- photocatalysis and photodegradation of pollutants in air, water, and soil
- photoconductivity, photovoltaics, and molecular photovoltaics of organic materials and new materials
- applications of photochemistry to molecules and various chemical systems, such as xerography, coatings, semiconductor microdevices, solar cells, fuel cells, electrochromism, photochromism, lasers, imaging, etc.

For more information, contact Prof. M. S. A. Abdel-Mottaleb, Photoenergy Center, Faculty of Science, Ain Shams University, Abbassia, Cairo, Egypt; E-mail: solar@photoenergy.org or solar@link.com.eg; Tel.: +20 12 216 9584 (cellular); Fax: +20 2 244 7683 or +20 2 484 5941; Web site: http://www.photoenergy.org/solar2001.html.

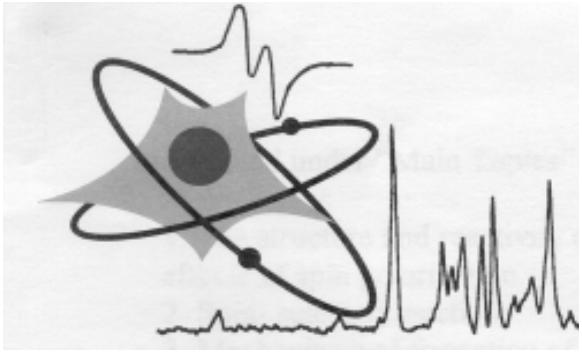
1st International Symposium on Macro- and Supramolecular Architectures and Materials (MAM-01): Biological and Synthetic Systems, 11–14 April 2001, Kwangju, South Korea

Major goals of this symposium include study of natural models for synthetic systems by integrating biomimicking concepts, investigation of effects and consequences of incorporating synthetic systems into biological systems (with emphasis on synergistic effects), and research on classical aspects of macro- and supramolecular architectures and materials.

The symposium will highlight cooperation between cell biology and materials science as the basis for the development of new biomaterials. Multiple sessions will be devoted to general topics, biological and biohybrid systems, and synthetic systems.

For further information, contact Prof. Kurt E. Geckeler or Prof. Pill-Soon Song, Symposium MAM-01, Kwangju Institute of Science and Technology (K-JIST), 1 Oryong-dong, Puk-gu, Kwangju 500-712, Korea; E-mail: mam@kjist.ac.kr or mam@matlb.kjist.ac.kr; Tel.: +82 62 970 2400; Fax: +82 62 970 2304 or +82 62 970 2338; Web site: http://matlb.kjist.ac.kr/~mam/index-net.html.

11th International Conference on Magnetic Resonance in Chemistry and Biology, 20–27 April 2001, Zvenigorod, Russia



The aim of this conference, organized by the Institute of Chemical Physics of the Russian Academy of Sciences (RAS) in cooperation with the Council of Pure and Applied Chemistry of the RAS and the International Electron Paramagnetic Resonance (EPR) Society, is to bring together scientists interested in the development of magnetic resonance techniques and experimental methods and their applications in chemical and biological research. Physical, inorganic, organic, analytical, applied, medicinal, and environmental chemistry will be covered. Three open forum discussion sessions will be featured on the following topics:

- nitric oxide in chemistry and biology
- advanced NMR imaging in biomedical fields and in solids
- the environment and magnetic resonance research

Main topic sessions will focus on the following applications:

- structure and reactivity of molecules, mechanisms of chemical reactions, and effects of spin polarization
- spin-selected reactions
- mechanisms of formation of complexes and radical reactions on surfaces
- structure and molecular dynamics of liquids, polymers, biopolymers, and micellar systems
- new approaches and progress in using spin labels and spin traps

- advanced magnetic resonance techniques and the environment; mechanisms of extreme effects on human health and the environment
- structure, biotransformations, mechanisms of drug actions, and effects of biologically active chemicals on cells
- nitric oxide in biological systems
- radical reactions in model biosystems; cellular and organismic processes
- NMR imaging in biomedical studies; other applied research
- high-resolution NMR in solids, NMR in liquids, NMR in biosystems
- theory, application, and development of EPR, spin labels and traps, pulsed EPR spectroscopy, high-frequency/high-field EPR and ENDOR, ELDOR, NQR, and other new approaches and methods in EPR and NMR spectroscopy

Approximately 120 scientific participants from around the world are expected to attend the conference.

For additional information, contact Prof. Anatoly Buchachenko, Semenov Institute of Chemical Physics, Russian Academy of Sciences, Kosygin Street 4, Moscow 117977, Russia; E-mail: spinchem@chph.ras.ru; Tel.: +7 095 939 74 90; Fax: +7 095 938 24 84.

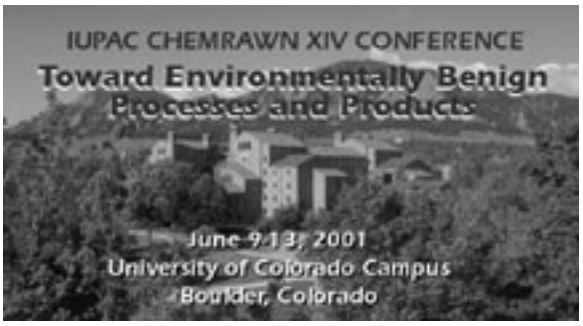
NATO Advanced Study Institute (ASI) on Molten Salts: From Fundamentals to Applications, 4–14 May 2001, Kas, Turkey

The scope of this workshop covers fundamental aspects and applications of molten salts, glasses, and metal/molten salt solutions. The Institute will address both high-temperature and low-melting salts, and it will deal with experimental approaches to reveal the microscopic, macroscopic, and dynamic behavior of melts. The role of computer modeling as a link between experiments and theory will be emphasized, as well as the importance of multidisciplinary and multitechnique approaches to unravelling the internal complexity of these technologically important liquids. The need to build up an easily accessible and reliable database will also be stressed.

Specific topics covered at the workshop will include the following: interionic forces and relevant statistical mechanics, diffraction studies, diffusion and transport, thermodynamics and thermochemistry, light scattering, electrochemistry, computer simulations, metal/molten salt solutions, ionic glasses, room-temperature molten salts, batteries, nuclear pyrochemistry, fuel cells, and data in the age of computerized science.

For more information, contact the Institute Secretariat, c/o Joyce Bartolini, IUSTI, Technopôle de Château Gombert, 5 Rue Enrico Fermi, F-13453 Marseille Cedex 13, France; E-mail: molten.salts@iusti.univ-mrs.fr; Tel.: +33 4 91 10 68 82; Fax: +33 4 91 11 74 39.

CHEMRAWN XIV World Conference on Green Chemistry: Toward Environmentally Benign Processes and Products, 9–13 June 2001, Boulder, CO, USA



Collectively we reside on a planet with insufficient natural resources to support profligate consumption. Chemistry plays a key role in increasing the efficiency of resource utilization in the development of products and processes. The key to implementing industrial ecology for a sustainable world is a new mindset that brings pollution prevention and energy conservation to the fore as design principles.

This Chemistry Research Applied to World Needs (CHEMRAWN) XIV Conference, jointly sponsored by IUPAC, the American Chemical Society, and the Green Chemistry Institute, will explore the latest scientific and engineering approaches and develop worldwide strategy and policy recommendations to implement green chemistry. The conference, to be held on the campus of the University of Colorado in Boulder, will bring together world leaders in specific fields to provide a catalyst for the common interersts of corporations, academic institutions, government agencies, and representatives of the public interest to determine a path for future action.

Objectives of the conference are to:

- conduct an objective assessment of the technical state-of-the-art in green chemistry and engineering and the contributions it can make to world sustainability;
- define scientific gaps, research priorities, economic and social issues in order to provide decision makers in industry, government, academia, and the nongovernmental sector with the knowledge required

to craft policy and accelerate application of green chemistry benefits to world needs; and
- identify and promote an educational program for green chemistry that spans educational levels and national boundaries.

The meeting will consist of invited lectures and contributed posters. Poster papers are solicited on the many topics involving the design of chemical processes and products that will eliminate or reduce the use or generation of hazardous substances. Examples of some specific topics to be discussed include alternative reaction media (e.g., supercritical CO_2) and separations, life cycle impacts, economic opportunities and case studies in large and small companies, environmentally benign food production, emerging biotech-based alternatives, green engineering, social impacts and sustainability, global innovations, green chemistry education, cleaner water and air, and success assessment and measurement. The deadline for abstract receipt is 1 December 2000; abstracts (150 words) should be submitted to Prof. Bob Sievers, Department of Chemistry and Biochemistry, Campus Box 215, University of Colorado, Boulder, CO 80309-0215, USA, on a standard ACS paper abstract form (available on the conference web site, http://cires.colorado.edu/env_prog/chemrawn) or electronically through the web site in the same format to be received at the University of Colorado by the deadline.

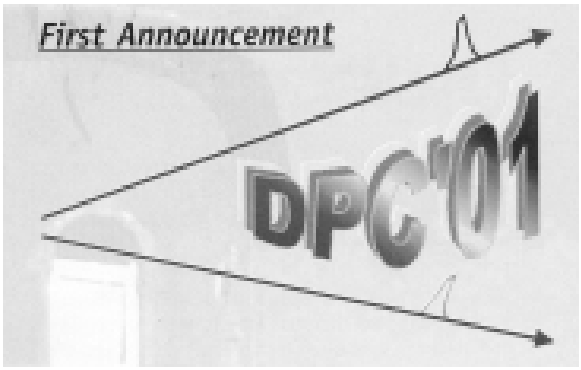
Scientists and policy makers from throughout the world will gather in Boulder to discuss sustainability issues, which may be addressed and improved by chemical research and wise policy development and implementation. Nobel Laureate Paul Crutzen of the Max Planck Institute in Mainz, Germany has agreed to give a plenary lecture. Other plenary speakers who have been invited and have tentatively accepted include Michael Fitzpatrick (Rohm and Haas), Joseph DiSimone (University of North Carolina), Zhu Qing Shi (Hefei, China), Joe Miller (duPont), Martyn Poliakopf (Nottingham, UK), Roger Beachy (Danforth Institute), Joe Thornton (author of *Pandora's Poison*, Columbia University), Neal Lane (President Clinton's Science Advisor), and Mary Good (President of AAAS). Additional information about the program and on-line registration will be available on the conference web site: http://cires.colorado.edu/env_prog/chemrawn.

Partial subsidy of the registration fee for students and limited support of travel by developing country scientists may be applied for from the conference organizers.

Approximately 900 scientific participants from around the world are expected to attend this conference.

For additional information, contact Dr. Dennis L. Hjeresen, Senior Program Manager, Environmental Management Programs, Los Alamos National Laboratory, Mail Stop J591, Los Alamos, NM 87545, USA; E-mail: dennish@lanl.gov; Tel.: +1 505 665 7251; Fax: +1 505 665 8118; Web site: http://cires.colorado.edu/env_prog/chemrawn/enter.html.

International Conference on Dynamical Processes in Excited States of Solids (DPC'01), 1–4 July 2001, Lyon, France



DPC'01 is a cross-disciplinary meeting for physicists, chemists, life scientists, and materials scientists interested in theoretical and experimental aspects of the dynamics of excited states in condensed matter. Basic as well as applied science aspects will be covered. The meeting will be limited to about 150 scientific participants, and all oral and poster sessions will be plenary.

Emphasis at DPC'01 will be on the underlying fundamental aspects of the following topics: dynamics of highly excited states of solids, energy transfer and exciton dynamics, electroluminescence, electron–phonon interaction and phonon dynamics, photoinduced large amplitude motions, cooperative motions, phase transitions, quantum optics, coherent and nonlinear spectroscopy, ultrafast phenomena, and spectroscopy of nanoscale and single nano objects.

For further information, contact Conference Secretariat, c/o Chantal Iannarelli, Congrès Scientifiques Services,2 Rue des Villarmains, F-92210 Saint-Cloud, France; E-mail: c2s@club-internet.fr; Tel.: +33 1 47 71 90 04; Fax: +33 1 47 71 90 05; or Scientific Secretariat, c/o Marie-France Joubert, LPCML, UMR 5620 CNRS, Université Claude Bernard Lyon 1, Bât. 205 43, boulevard du 11 novembre 1918, F-69622 Villeurbanne cedex France; E-mail: joubert@pcml.univ-lyon1.fr; Tel.: +33 4 72 44 83 39; Fax: +33 4 72 43 11 30; Web site: http://pcml.univ-lyon1.fr/DPC01/welcome.html.

European Symposium on Organic Reactivity (ESOR 8), 2–6 August 2001, Dubvornik, Croatia

For more information, please contact Prof. Mirjana Eckert-Maksic, Rudjer Boskovic Institute, Chemistry Department, Bijenicka c. 54, 10001 Zagreb, Croatia.

International Workshop/Conference on Coupled, Hyphenated, and Multidimensional Liquid Chromatographic Procedures for Separation of Macromolecules, 9–13 September 2001, Bratislava, Slovak Republic

This meeting, organized by the Polymer Institute of the Slovak Academy of Sciences and the Slovak Society of Industrial Chemistry, will bring together researchers from West and East working in both academic and industrial laboratories that are engaged in separation techniques aimed at characterization of synthetic and natural macromolecules. Current developments in separation methods and their applications will be discussed, including recent progress in the characterization of industrial polymeric materials and complex macromolecular systems such as copolymers, polymer blends, and functionalized macromolecules.

Specific topics will include the following:

- coupling of different separation mechanisms within one single liquid chromatographic (LC) column
- hyphenation of various LC detectors, as well as combination of LC with nonchromatographic techniques (mass spectrometry, NMR and IR spectrometry, etc.)
- two- and multidimensional LC of complex polymers: combination of two or several independent LC systems

For additional information, contact Organizing Committee 2001, c/o Prof. Dusan Berek, Polymer Institute of the Slovak Academy of Sciences, Dubravska cesta 9, SK-842 36 Bratislava, Slovakia; E-mail: upolconf@savba.sk or upoldber@savba.sk; Tel.: +421 7 5477 1641; Fax: +421 7 5477 5923 or +421 7 5477 7409; Web site: http://nic.savba.sk/~upoldber/.

9th International Conference on Correlation Analysis in Chemistry (CAIC-IX), 9–14 September 2001, Borówno (Bydgoszcz), Poland

This conference, organized under the auspices of the International Group for Correlation Analysis in Chemistry (an Associated Organization of IUPAC), will cover structure–activity relations, structure–reactivity correlations, structure–physical property relationships, spectral properties, substituent effects, solvent and medium effects, weak molecular interactions, macromolecular systems, and molecular modeling. Two roundtable discussions will be held on past, present, and future of (1) correlation analysis in chemistry and (2) solvent effects.

For more information, please contact Dr. Ryszard Gawinecki, Department of Chemistry, Technical and Agricultural University, Seminaryjna 3, PL-85-326 Bydgoszcz, Poland; E-mail: gawiner@chem.atr.bydgoszcz.pl; Tel.: +48 052 3792900; Fax: +48 052 3731160.

Conference Calendar

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

NEW *designates a new conference since the last issue.*

2000

Food Packaging

8–10 November 2000
2nd International Symposium on Food Packaging—Ensuring the Safety and Quality Food, Vienna, Austria.

Liên-Anh Tran, ILSI Europe, 83, Avenue E. Mounier, Box 6, B-1200, Brussels, Belgium.
Tel.: +32 (2) 771 0014
Fax: +32 (2) 762 0044
E-mail: anh@ilsieurope.be

Polymers

20–24 November 2000
7th Latin-American Symposium on Polymers (SLAP'2000) and 5th Ibero American Congress on Polymers, Havana, Cuba.
Dr. Ricardo Martínez, Dr. Waldo Argüelles-Monal, IMRE,

Universidad de La Habana
La Habana 10400, Cuba.
Fax: +53 7 33 42 47
E-mail: slap@imre.oc.uh.cu

2001

Polymer Characterization

9–12 January 2001
9th 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

Green Chemistry

10–13 January 2001
International Symposium on Green Chemistry, Delhi, India.
Dr. M. Kidwai, Organizing Convenor, Department of Chemistry, University of Delhi
Delhi 110007, India
Tel.: +91 11 725 6235
Fax: +91 11 725 6250
E-mail: mkidwai@mantraonline.com

Macromolecules

9–11 April 2001
4th Annual UNESCO School and South African IUPAC Conference on Macromolecules and Materials Science, Johannesburg, South Africa.
Prof. R. D. Sanderson, UNESCO Associated Centre for Macromolecules and Materials, Institute for Polymer Science, University of Stellenbosch, Private Bag X1, Matieland 7602, South Africa
Tel.: +27 21 808 3172
Fax: +27 21 808 4967
E-mail: rds@maties.sun.ac.za

Chemistry and Chemical Engineering

16–20 April 2001
IV International Congress on Chemistry and XIII Caribbean Conference on Chemistry and Chemical Engineering, Havana, Cuba.
Prof. Alberto J. Núñez Sellés, Sociedad Cubana de Química, Ave 21&200, Atabey, Apdo. 16042, CP 11600, Havana, Cuba.
Tel.: +537 218 178
Fax: +537 336 471
E-mail: cqf@cqf.co.cu

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

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

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.

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. Jousseaume, Laboratoire de Chimie Organique et Organometallique, UMR 5802, Universite Bordeaux 1, 351 avenue de la Liberation, F-33405 Talence Cedex, France.

Tel.: +33 (0) 5 56 84 64 43
Fax: +33 (0) 5 59 84 69 94
E-mail: b.jousseaume@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: yoshifj@mail.cc.tohoku.ac.jp

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, Toyko 113-8656, Japan.
Tel.: +81 3 5841 7236 (or 7237)
Fax: +81 3 5841 6037
E-mail: icas2001@laser.t.u-tokyo.ac.jp

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

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 Phamocognosy, 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

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

Chromatography

6–8 February 2002
7th International Symposium on Hyphenated Techniques in Chromatography and Hyphenated Chromatographic Analyzers (HTC-7), Bruges, Belgium.
This conference has declined IUPAC sponsorship.

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 X1, Matieland 7602, South Africa
Tel.: +27 21 808 3172
Fax: +27 21 808 4967
E-mail: rds@maties.sun.ac.za

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

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

Chemical Thermodynamics

28 July–2 August 2002
17th IUPAC Conference on Chemical Thermodynamics, Rostock, Germany.
Prof. A. Heintz, FB Chemie, Universitat 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

Bioorganic Chemistry

11–14 August 2002 *(new dates!!)*
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

It is a condition of sponsorship that organizers of meetings under the auspices of IUPAC, in considering the locations of such meetings, should take all possible steps to ensure the freedom of all bona fide chemists from throughout the world to attend irrespective of race, religion, or political philosophy. IUPAC sponsorship implies that entry visas will be granted to all bona fide chemists provided application is made not less than three months in advance. If a visa is not granted one month before the meeting, the IUPAC Secretariat should be notified without delay by the applicant.

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

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Reports from IUPAC Bodies

Reports from IUPAC-Sponsored Symposia