

# IUPAC adopts strategic plan

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The Executive Committee on 23 February 1998 adopted a Strategic Plan for 1998–99 on behalf of the Bureau. Revisions to the plan will be considered each biennium. The text of the plan is available on the Union's web site (hyperlink <http://www.iupac.org>) in HTML format for direct viewing. It can also be downloaded in either word processing format (rich text) or Adobe Acrobat (PDF) format.

An implementation plan based on the Strategic Plan will be presented to the Bureau at its meeting on 26–27 September 1998 at Frankfurt a.M., Germany. After adoption, the implementation plan will also be distributed widely within the Union.

## IUPAC strategic plan—1998

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The International Union of Pure and Applied Chemistry (IUPAC) was formed in 1919 by chemists from industry and academia. Over nearly eight decades the Union has succeeded in fostering world-wide communications in the chemical sciences and in uniting chemistry—academic, industrial and government—in a common language. IUPAC has long been recognized as the world authority on chemical nomenclature, terminology, standardized methods for measurement, atomic weights and many other critically evaluated data. The Union continues to sponsor major international meetings that range from specialized scientific symposia to CHEMRAWN meetings with societal impact. During the Cold War, IUPAC became an important instrument for maintaining scientific and technical dialogue among the world's chemists.

With the major changes that have occurred world-wide in chemistry and the chemical industry, it is important that IUPAC examine its activities and define its role as the organization principally responsible for promotion of the chemical sciences internationally. Following a series of meetings to obtain input from leaders in chemistry on four continents, IUPAC has redefined its mission and established goals and strategies to guide its approach to the shaping of the chemical sciences and the service of chemistry in a rapidly changing world.

### Mission statement

*IUPAC's mission is to advance the world-wide aspects of the chemical sciences\* and to contribute to the application of chemistry in the service of mankind. In so doing, IUPAC promotes the norms, values, standards and ethics of science and advocates the free exchange of scientific information and unimpeded access of scientists to participation in activities related to the chemical sciences.*

### Long range goals

To further its mission, IUPAC has established a set of long-range Goals and has formulated strategic thrusts that are aimed at achieving each of the Goals. The Goals are summarized here, and the complete set of Goals and Strategic Thrusts for the current biennium is given on the following pages.

1. IUPAC will serve as a scientific, international, non-governmental body in objectively addressing global issues involving the chemical sciences. Where appropriate, IUPAC will represent the interests of chemistry in governmental and non-governmental forums.
2. IUPAC will contribute to the advancement of research in the chemical sciences throughout the world.
3. IUPAC will assist chemistry related industry in its contributions to sustainable development, wealth creation and improvement in the quality of life.
4. IUPAC will facilitate the development of effective channels of communication in the international chemistry community.
5. IUPAC will promote the service of chemistry to society in both developed and developing countries.
6. IUPAC will utilize its global perspective to contribute toward the enhancement of education in chemistry and to advance the public understanding of chemistry and the scientific method.
7. IUPAC will make special efforts to encourage the career development of young chemists.
8. IUPAC will broaden the geographical base of the Union and insure that its human capital is drawn

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\*In recognition of the role of chemistry as a central science in a wide range of fields, the term 'chemical sciences' is used here to refer to chemistry, broadly defined, and to those disciplines and technologies that make significant use of chemistry.

- from all segments of the world chemistry community.
9. IUPAC will encourage world-wide dissemination of information about the activities of the Union.
  10. IUPAC will assure sound management of its resources to provide maximum value for the funds invested in the Union.

### Goals and strategic thrusts—1998–1999

To further its mission, IUPAC has established a set of long-range Goals and has formulated strategic thrusts that are aimed at achieving each of these Goals. These strategies are intended to guide the development of operational plans and the setting of priorities for optimal use of the Union's resources, both human and financial.

*1. IUPAC will serve as a scientific, international, non-governmental body in objectively addressing global issues involving the chemical sciences. Where appropriate, IUPAC will represent the interests of chemistry in governmental and non-governmental forums.*

- IUPAC will conduct projects pertaining to the chemical aspects of important issues of international concern. In addition to projects initiated within IUPAC, input for new projects of scientific and industrial importance may come from international governmental and non-governmental bodies and from appropriate public groups. Examples are the series of CHEMRAWN conferences, the recent *White Book on Chlorine* and the studies of methods for disposal of chemical weapons. IUPAC will not undertake projects that cast it in the role of policy development or as an advocate for special interest groups.
- Collaborations with international governmental bodies, such as UNESCO and the World Health Organization, should continue and be strengthened. The IUPAC/UNESCO International Council for Chemistry will serve as the central forum for planning and coordinating work with UNESCO. Collaborations with other individual scientific Unions, with international scientific societies, and with the International Council of Scientific Unions (ICSU) should be enhanced to plan and carry out projects of an interdisciplinary nature.

*2. IUPAC will contribute to the advancement of research in the chemical sciences throughout the world.*

- The importance of standardized nomenclature, symbols, terminology and methodology is critical to communication in the chemical sciences. To remain the recognized international authority in this area, IUPAC must ensure that important problems are recognized and treated fairly and expeditiously. Collaborations with national and regional chemistry societies, with

governmental bodies and with commercial information organizations should be augmented. Greater efforts should be made to encourage adoption of IUPAC recommendations through contacts with authors, editors and publishers.

- The biennial IUPAC Congress is intended to present the most outstanding relevant developments in modern chemistry and to inspire high research standards. Future Congresses should adhere to this principle.
- An assessment should be made of IUPAC sponsorship of specialized symposia in order to strengthen this well accepted program. New significant research fields in chemistry should be highlighted by the initiation of relevant high quality symposia.
- Special attention should be devoted to improving the quality of the Union's scientific publication program. Bibliometric analysis and other criteria can be used to assess the impact of IUPAC books and the journal *Pure and Applied Chemistry*. IUPAC should take advantage of advances in electronic publishing methods to ensure high quality publications that are disseminated in a rapid and cost-effective manner.
- Policies should be developed for IUPAC's role in the preparation and dissemination of critically evaluated databases, from atomic weights to thermodynamic and other chemical data.

*3. IUPAC will assist chemistry related industry in its contributions to sustainable development, wealth creation and improvement in the quality of life.*

- IUPAC is unique among the International Scientific Unions in including within its scope a large industrial base. IUPAC is often perceived as being oriented primarily toward academic institutions, but industry benefits equally from much of the Union's work in standardized symbols, nomenclature and terminology, as well as from critically evaluated data. Greater efforts should be made to demonstrate the ways in which IUPAC serves industrial needs directly and indirectly. In addition to the present links provided by the Committee on Chemistry and Industry, serious efforts are needed to engage leaders in the chemical industry and national and international industry associations in dialogue to explore ways in which IUPAC and industry can enhance mutually beneficial interactions.
- IUPAC should be particularly alert to projects that help develop the scientific basis for practices and procedures that protect society while encouraging responsible and sustainable development. Such projects may be initiated in the basic chemistry Divisions, as well as in the mission-oriented Divisions (Chemistry and the Environment, and Chemistry and Human Health).

*4. IUPAC will facilitate the development of effective channels of communication in the international chemistry community.*

- The vast potential of the Internet should be utilized to enhance information transfer between IUPAC and chemists in many countries. The Affiliate Member Program already provides a base, which should be expanded many-fold.
- *Chemistry International* should be developed as a forum for highlighting important problems and advances in chemistry and for discussion of science policy and global issues in chemistry.
- Increased efforts should be made to provide information on IUPAC activities and news about important matters of international chemistry to major scientific journals and national and regional chemistry news magazines, which routinely reach hundreds of thousands of chemists world-wide. Feedback should be encouraged.

*5. IUPAC will promote the service of chemistry to society in both developed and developing countries.*

- CHEMRAWN Conferences have long provided the principal mechanism for IUPAC to address issues that transcend pure science and have important socio-political aspects. Such Conferences should continue to be promoted, along with follow-up Future Action Programs.
- IUPAC bodies should continue to be alert to projects on matters of societal importance (e.g. chemical weapons disposal, environmental cleanup) that depend heavily on chemical sciences and technology.
- Within its limited funds, IUPAC should consider ways to foster chemistry in developing countries. In many instances, IUPAC's initiative and scientific expertise has been paired with outside funding sources (e.g. recent UNESCO-supported work in the least developed countries and the UNESCO/UNIDO/IUPAC program in chemical safety) to produce valuable results, and this model should be further elaborated.

*6. IUPAC will utilize its global perspective to contribute toward the enhancement of education in chemistry and to advance the public understanding of chemistry and the scientific method.*

- Scientists everywhere recognize the critical role played by formal and informal education at all levels, from kindergarten through graduate school, not only for future scientists but also for the general public. The problems associated with such educational programs are enormous. Educational systems, administration and curricula vary drastically by country, locality and individual school and teacher. IUPAC cannot hope to make an impact on detailed curricula or outreach activities in individual countries and localities, but it may be able to complement the efforts

of national chemical societies and to coordinate exchange of information. IUPAC should examine carefully what long-range role it can realistically play in international science education and develop appropriate policies. Meanwhile, a number of specific activities can usefully be initiated or continued, as described below.

- The Committee on Teaching of Chemistry (CTC) has been effective in carrying out its program on exchange of information on teaching methods, equipment, etc. CTC should continue to serve as the focal point for IUPAC's programs in this area, but its programs should be broadened. In addition, IUPAC Divisions should be invited to develop complementary projects to enhance education at all levels and to coordinate them with CTC.
- IUPAC should cooperate in whatever ways are feasible with the major new program established by ICSU on Capacity Building in Science, which will endeavour to disseminate information on science teaching in primary schools and science education for the public.

*7. IUPAC will make special efforts to encourage the career development of young chemists.*

- It is apparent that the future development of the chemical sciences lies largely in the hands of the younger generation of scientists, who often encounter severe obstacles in an era of constrained resources. IUPAC should develop programs that are perceived by 'younger chemists' to be helpful to them and feasible for the Union to undertake within its resources. Young chemists from developing countries who return after advanced training elsewhere may benefit particularly from these programs and from exchange of information with IUPAC via the Internet.
- IUPAC should strongly encourage organizers of the IUPAC Congress and IUPAC-sponsored symposia to provide travel support for younger scientists and to include younger scientists among the invited lecturers.
- IUPAC Commissions and other bodies should make special efforts to recruit well qualified younger scientists for their projects. Several National Adhering Organizations (NAOs) now provide travel support for younger scientists to attend the General Assembly as Associate Members, National Representatives or Observers; other NAOs should be encouraged to follow this lead.

*8. IUPAC will broaden the geographical base of the Union and insure that its human capital is drawn from all segments of the world chemistry community.*

- The Union is taking active steps toward globalization of its activities with regional meetings and solicitation of input from the world's chemists.

- The 42 National Adhering Organizations and 14 Observer Organizations that currently comprise IUPAC are broadly distributed throughout the world, but there are several geographic regions with little or no representation in the Union and a number of countries with substantial academic and industrial developments in chemistry that do not adhere to the Union. IUPAC should encourage such countries to apply for membership. In addition, IUPAC should stimulate less developed countries to seek Observer status.
- The Union has long had a formal policy of 'fair geographical representation' among Elected Members of the Bureau and informally strives to obtain geographic diversity among IUPAC and Division Officers. While maintaining the focus on expertise, IUPAC's scientific bodies should make efforts to recruit younger chemists, women chemists and chemists from recently developed regions, including in some instances countries that are not yet full Members of the Union.

*9. IUPAC will encourage world-wide dissemination of information about the activities of the Union.*

- Much of the valuable work done by IUPAC bodies is published only in Pure and Applied Chemistry or in specialized books and journals. Although such formal and archival publication is essential, greater efforts should be made by individual IUPAC bodies, the Secretariat and the NAOs to disseminate this information as early and as widely as possible to the relevant scientific community. In many instances, high quality reports from symposia, workshops and Commission activities should be prepared not only as formal scientific publications but also as semipopular documents emphasizing applications. For topics that warrant attention in the popular scientific press, carefully drawn news releases are needed.
- Contacts with major national chemical societies, regional chemistry federations, industrial associations, and government/industry/university consortia should be expanded to ensure that these organizations are fully aware of IUPAC activities and can provide credit to the Union where its activities complement theirs.
- Improved two-way communication with NAOs concerning science policy, planning and implementation of projects and other activities is needed. Special efforts should be made to prepare suitable material describing IUPAC programs and accomplishments in a form that will assist NAOs in recruiting Company Associates.

*10. IUPAC will assure sound management of its resources to provide maximum value for the funds invested in the Union.*

- The Union can undertake its many activities only be-

cause of stable financial support from its National Adhering Organizations, which in turn usually obtain their resources from government and/or industrial sources. IUPAC has a continuing responsibility to demonstrate to its sponsors that all relevant management tools, including the use of modern information technology, are employed to maximize productivity in the administration of the Union.

- IUPAC should encourage philanthropic donations to the Union's endowment. With continued wise investment strategies that assure maximum return consistent with reasonable safety, the endowment and operating reserves will provide a continuing source of funding that augments and leverages the subscriptions from the NAOs.
- Although the purpose of the IUPAC publications program is the dissemination of scientific information, this program has for a number of years provided substantial income to help support IUPAC's other work. As the program is redirected in the era of electronic publishing, efforts should be made to continue to have publications as a source of funds, rather than a drain on the Union's resources.
- Officers of IUPAC bodies and the Secretariat should continue to be alert to possible sources of funds for specific projects from outside groups (e.g. UNESCO, ICSU, charitable foundations and industry) to augment the base funds provided by NAO subscriptions.

**Implementation and updating of the strategic plan**

The Strategic Plan is intended to articulate the scientific and operational policy of IUPAC, providing overall policy guidance to the IUPAC Divisions and Standing Committees for assistance in the development of coordinated programs to advance the Union's mission. This Plan should not impede or replace initiatives at all levels within the Union. The Council, Bureau and Executive Committee will formulate procedures for ensuring that operational programs will be drafted and resources allocated within the context of the Strategic Plan, that responsibilities will be assigned for implementation of programs, and that outcomes will be evaluated.

Each biennium the strategic thrusts will be analysed and updated as needed. The long-range goals may also be revised when appropriate, but probably on a longer time frame.

## New IUPAC Web Site

The IUPAC Web Site (<http://www.iupac.org>) has been extensively revised and updated. Information on the officers of the Union, Council Actions, Press Releases, Commission Activities and much more is available. The site is now located at the Sunsite server at the University of North Carolina, Chapel Hill. This is a large server with high bandwidth access. The Royal Society of Chemistry plans to support a mirror site on their server. Future plans include inclusion of the full text of recommendations and reports from *Pure & Applied Chemistry* as well as provisional recommendations during the public comment period. Each issue of *Chemistry International* will be posted as soon as it is printed. Comments are welcome and should be sent to [secretariat@iupac.org](mailto:secretariat@iupac.org)

## Meeting of Presidents of regional chemical societies

Research Triangle Park, North Carolina, USA,  
29–30 January 1998

### Minutes

#### Attendees

- Prof. J. Jortner**, President, International Union of Pure and Applied Chemistry  
**Prof. L. Niinistö**, President, Federation of European Chemical Societies  
**Prof. H. Ohtaki**, President, Federation of Asian Chemical Societies  
**Prof. B. Rivas**, President, Federación Latinoamericana de Asociaciones Químicas  
**Prof. P.H.L. Walter**, President, American Chemical Society  
**Prof. L. Weiler**, President, Canadian Society for Chemistry  
**Dr D.H.M. Bowen**, Former Chairman of IUPAC Committee on Print & Electronic Publications  
**Dr J. Malin**, Administrator, International Activities, American Chemical Society  
**Prof. P. Reyes**, General Secretary, Federación Latinoamericana de Asociaciones Químicas  
Secretary: **Dr J.W. Jost**

#### 1. Welcome and Introduction

Prof. Jortner extended a warm welcome to the Presidents of the Regional Chemical Societies at the first meeting of the group. He noted that this meeting was the first of its kind. The initiative for this meeting came from some of the Presidents of the regional Chemical Societies during the IUPAC Geneva Congress and General Assembly last August. IUPAC is honored to provide its good services to convene this important meeting. IUPAC represents and acts for the entire world chemistry community and the Presidents of the

regional Chemical Societies represent almost the entire world of chemistry. We regret that Prof. Bekoe, the President of the African Association of Pure and Applied Chemistry, could not join us.

The purpose of the meeting was to share information and determine areas in which the group could cooperate. The agenda was intended to be flexible and lead to an open interchange of ideas. Each President gave a brief overview of his society's activities and areas of special interest or concern. Subsequently each President led the discussion on one of the Agenda topics.

#### 2. Review of the activities of regional chemical societies

Prof. Rivas and Prof. Reyes presented the general aspects of financial support, publications, chemical education and PhD programs for the Societies that are members of FLAQ. It was noted that only two Journals published in Latin America are indexed in ISI, *Anales de la Asociación Química Argentina* and *Boletín de la Sociedad Chilena de Química*. As an example of the situation in one member of FLAQ, Prof. Reyes described the economic and social environment in Chile. He noted the concern of the Chilean Chemical Society that fewer students were studying chemistry in secondary school or University. Some University degree programs are underutilized, graduating only a few advanced degree recipients each year. These concerns are shared by many of the other member societies of FLAQ.

Prof. Ohtaki reviewed the structure of FACS. FACS sponsors a conference each year. He described the dif-

faculties in operating a regional society that includes an advanced industrial nation, Japan, whose chemists interact mainly with their counterparts in Europe and North America, and a number of developing nations whose chemical industry is small and underdeveloped.

Prof. Weiler noted that the Canadian Society has excellent relations with the ACS and cooperates closely with it. Some problems are unique to Canada. One current issue that is of concern is the move to license those who provide chemical services through groups other than chemical societies. This could lead to the situation where only engineers or certain kinds of other professionals could legally carry out certain activities which were traditionally done by chemists. This situation exists in other parts of the world, such as Europe, but seems to be moving further forward in Canada. The Society has only recently become aware that these licensing proposals could prevent chemists from practising in many traditional areas such as environmental analysis. Prof. Niinistö noted that similar actions are being contemplated in Europe as a result of the desire to set European Union-wide standards for chemists and other technical professionals.

Prof. Niinistö discussed the effects of the ongoing economic, social and political integration of the member states of the European Union. This has led to the need for chemical societies to speak to the EU administrators in Brussels in addition to the ongoing discussions with governments at the national level. He also noted the consolidation of scientific publication, a topic he would address in more detail when the subject of cooperation in publications was discussed.

Prof. Walter reviewed the structure and function of the ACS. International activities involving education and the public understanding of science are centred in the International Activities Office. Recent important activity will be the Chemistry Week in 1999 during the ACS celebrations. Other important international activities focus on human Rights, the exchange of scientists and the donation of scientific material to developing countries. Prof. Walter noted that while each society focuses on national issues, many issues that seem to be national have an effect on chemists in other countries. He planned to address this issue in more detail when the agenda item on cooperation in legislative issues was discussed.

Prof. Jortner reviewed the current changes being discussed in the organization and management of IUPAC's scientific work.

Prof. Jortner emphasized four principles:

- Globalization of the Science and Technology Endeavour
- Interdisciplinary nature of scientific activities
- Expanding boundaries of the chemical sciences
- Mission-oriented service of chemistry

Prof. Jortner noted that IUPAC represents the global chemical science community, while the regional societies represent chemists in the national chemical societies. He then noted the meetings held by IUPAC to seek input from leaders of the chemical communities on the role of IUPAC. Meetings have already been held in North America, Europe and Asia, with meetings planned for Africa and Latin America later in 1998. He reviewed the membership of IUPAC, including the Company Associates and the Union's structure of Divisions and Commissions. Prof. Jortner pointed out disciplinary gaps, particularly for Material Science and Biomolecular Chemistry, and the difficulty of establishing interdisciplinary activities. He noted that the current funding of IUPAC projects is tied to people, Titular Members, not projects.

Prof. Jortner then briefly reviewed the charge of the Strategy Development and Implementation Committee and its membership. He reviewed the Goals the Committee had developed as the basis for the Union's strategy. The principles on which the Union's work are based are quality, relevance and global dimension. The next planned steps are to obtain approval of the Strategic Plan and its distribution, followed by its implementation.

Prof. Jortner discussed the 'Future Message of IUPAC', noting the importance of capacity building, the infrastructure of science, global communication and the commitment of the world's chemical societies to information transfer and global activities. Prof. Jortner concluded his remarks by noting that administrative changes are important but that new content is the most important. IUPAC needs and desires input from the global chemical community and in particular from this group.

### 3. Cooperation on legislative and governmental issues

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Prof. Walter expanded on his earlier comments by noting that chemists work in a global environment. They often work for companies that do business in many parts of the world and must be able to practice in those countries. This is related directly to the issue raised by Prof. Weiler, of who controls the licensing of professionals who do chemistry. Chemistry is affected by legislation, environmental regulations and regulations controlling the licensing of drugs and agricultural chemicals have effects beyond national borders.

The issue of intellectual property also has global implications. This issue has also been dominated by nonchemists, often lawyers and the entertainment industry. The harmonization of patent and trademark regulations and the protection of patents and copyrights are issues of great importance to many chemists. The

protection of intellectual property and the preservation of the ability of academic researchers to use public domain information are often in conflict, with chemists concerned on both sides of the issue.

The group agreed that it was important for regional and national chemical societies to be aware of new laws and regulations in other parts of the world. The group agreed that a series of international workshops and seminars on chemical regulatory matters and risk/benefit analysis would be beneficial. Prof. Jortner volunteered the IUPAC Secretariat as a resource to act as a clearinghouse for this information, possibly by the use of the internet. A list server could be set up on the IUPAC web site to facilitate information exchange among those concerned with legislation and regulation in the regional and national societies.

#### 4. Chemical education

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Prof. Rivas opened the discussion of this topic by noting the differences in chemical education world-wide. Some countries would like information that helps them decide what are the 'best' centers for teacher training. He also noted the value of short stays by PhD students in advanced programs. This is often best done in places other than North America or Europe. He gave the example of Peruvian students spending part of a year doing research at a Chilean or Argentinean University.

Prof. Reyes emphasized the importance of sharing experiences on how to increase the enrollment of students in chemistry in high schools. He noted that the number of students in Chile studying chemistry is decreasing, while law, business, and medicine attract the brightest students.

Prof. Weiler commented that simply increasing the salaries of high school teachers is not the answer to improving chemistry education. He stressed the importance of setting requirements for chemistry teachers.

Prof. Jortner noted that chemistry can be viewed as the basis of a scientific education and agreed that international guidelines should be set for chemical education.

Prof. Walter observed that dissatisfaction with chemical education is 'global'. The students in all of the countries represented at this meeting compete globally. He proposed that the staff members responsible for chemical education at each society meet to discuss education standards. Prof. Jortner pointed out the possible value of a workshop on this issue.

Prof. Ohtaki noted that one possible area of cooperation is in the translation of textbooks into other languages.

The suggestion was made that a workshop could be organized to set the agenda for a CHEMRAWN Confer-

ence on Chemistry Education. Dr Malin agreed to organize the workshop.

#### 5. Public understanding of science

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Prof. Niinistö introduced this topic by noting that the ACS National Chemistry Week program seemed to be the kind of program other societies should institute. He asked the ACS representatives present how successful the program had been.

Dr Malin noted the importance of local section involvement. The program seems to bring chemistry to the attention of the public. The program has been built up over the years as local sections learn what works—and what doesn't—in bringing chemistry to the public. He pointed out that for the last two years National Chemistry Week had been featured on the Today TV program.

Prof. Weiler commented on the Canadian experience with National Chemistry Week by noting that academic chemists tend to do 'gee whiz' demonstrations that attract younger children while industrial chemists do programs that attract older children and adults.

#### 6. Cooperation in publications

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Prof. Weiler introduced the topic by describing some of the changes occurring in journal publication, in the means of submission, distribution and storage of information. He noted that we need to consider the proliferation of information. What is the role of the learned societies *vis-à-vis* commercial publishers? What is the role of international organizations? How do we evaluate the value of information?

Prof. Niinistö described the changes taking place in the European journal market. A number of national journals are being consolidated into three journals to be published for the national societies by Wiley-VCH. The journals of the Royal Society of Chemistry, those of the Elsevier Group and some journals by independent learned societies constitute the rest of the market, but consolidation and regrouping is also taking place. Thus, all European journals will be published by one of three large groups and a few small societies.

Prof. Walter commented that journals would continue to exist only as long as they provide added value. The new modes of electronic publication offer efficiencies in the distribution of information, but the low cost and ease of distribution of information on the web leads to a proliferation of unreviewed publications. There is still a need for the traditional functions of the peer-reviewed publication, the issue is how to charge for that function. He also noted that the new environment of the world-wide web had undetermined implications for secondary and tertiary publications such as *Chemical Abstracts*.

The group concluded that there was no obvious need for a cooperation forum or mechanism in the publications area.

## 7. Cooperation in membership

Prof. Ohtaki noted that IUPAC must expand its membership to include Asian and African Societies. Prof. Jortner described the steps that IUPAC was taking to recruit more of these societies into the Union. Prof. Walter commented that demonstrating the value of membership was the key issue.

Discussion of this topic had to be cut short due to a lack of time, despite its interest.

## 8. Conclusions

Prof. Jortner reviewed the main points of the discussions, the need to cooperate on education issues, the public image of chemistry and global chemical legislation and government issues. Prof. Jortner pointed out that the role of IUPAC in regional collaboration will be:

- Catalysis of regional collaboration
- Supplement regional collaboration by global international activities
- Assistance in information flow
- Enhance (but not mediate) direct interregional interaction

The participants agreed that the meeting had been extremely useful. The group will meet again at the occasion of the IUPAC General Assembly (at Berlin in 1999). The time and location of meetings in the non-General Assembly years will be determined at a later date.

# The transition of the chemical industry

Dr Hans K. Jucker, former Chairman of the Board of Alusuisse-Lonza Holding, Ltd

Presented to the Meeting of Chemical Society Presidents held in conjunction with the IUPAC Congress and General Assembly, Geneva Switzerland, 21 August 1997

## Introduction

The global Chemical Industry is in transition from a structure that has existed since the beginning of the post-war era. This structure was characterized by the dominance of large integrated petrochemical companies and large mixed product 'classical' chemical companies. The new structure will be dominated by large life science companies and smaller R&D driven companies

The transition of the chemical industry	
1980	2010
Integrated Petrochemical companies 'the big 9'	Large Life Science companies
Large mixed product chemical companies 'classical'	Small to medium specialized companies
Specialty chemical companies	Emerging R&D driven companies
Small chemical companies	'Me too' companies for isolated/protected markets
State owned chemical companies	Medium suppliers to the 'outsourcers'
	Large basic chemical companies

Fig. 1 The transition of the chemical industry



Dr Hans K. Jucker

besides the often state-owned petrochemical complexes. This transition is shown schematically in Fig. 1. R&D will be a significant factor in the prosperity of most of the organizations competing in this new environment. R&D has been an important factor for chemical companies since the creation of the first chemical companies in the 19th century. The qualitative difference in this new phase that the chemical industry is entering, is the prevalence of interdisciplinary team-based research. It is this change in the nature of R&D in the chemical industry that I would like to discuss.



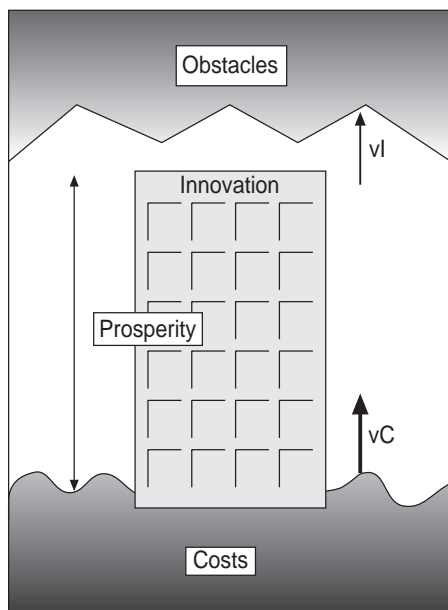


Fig. 2

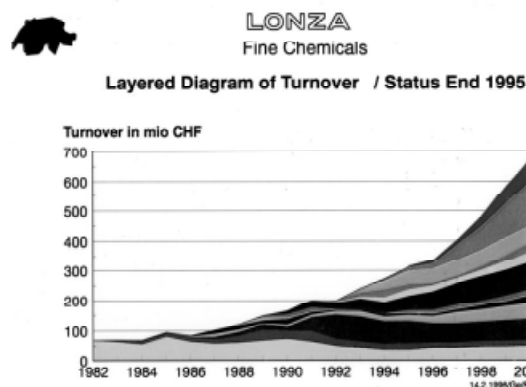


Fig. 3

### The role of innovation

Figure 2 shows a building which represents a chemical company, or for that matter, any other enterprise in a modern economy. The building is slowly being flooded from below. The inhabitants must build new floors on top to maintain or increase the number of habitable floors. The number of habitable floors is a measure of the prosperity of the organization or society. The rising water level represents the increase in costs of the firm's activities. The rate of increase of costs is represented as  $v_c$ , while  $v_i$  represents the rate of innovation. It is by innovation that new floors are added to the building. Much of the activity of the past decade has been focussed on reducing  $v_c$ . The sustainability equation for the system therefore being  $v_i > v_c$ . Figure 3 shows the proportion of the current turnover of a member of the Alusuisse-Lonza Group from products developed since 1982. LONZA is a typical example of a high-tech, medium sized chemical corporation.

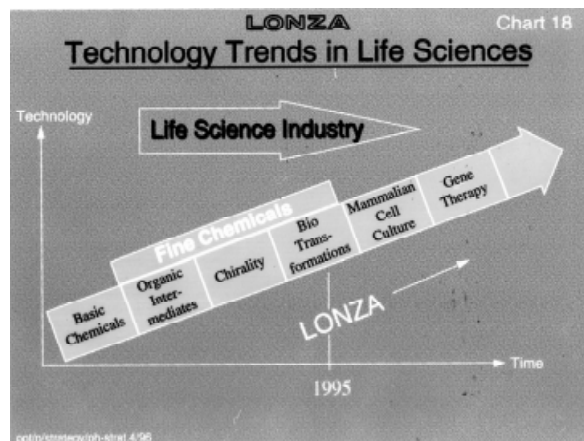


Fig. 4

The same point can be made in a different way by considering Fig. 4. The nature of the technology employed by LONZA has changed, from the origins of the company in basic chemicals, to its evolution into a fine chemicals company, to its expected future as a company based on biotransformations and gene therapy. Let us take as an example the LONZA plant in Visp (in the Valaisan alps, not far from Geneva) In this connection, we can note that the number of LONZA employees with technical degrees has increased from less than 200 in 1980 to over 300 in 1997, while the number of other employees has changed very little. Increasing from slightly more than 2200 to slightly less than 2400.

### The innovation process

Since I believe we are entering a period where innovation will be a key success factor for the chemical industry, I would like to discuss the Innovation Process. This is a process that has many myths associated with it. Figure 5 is a diagram illustrating one of those myths, the myth of the linear progression from problem generation to result. The mythological nature of this linear process

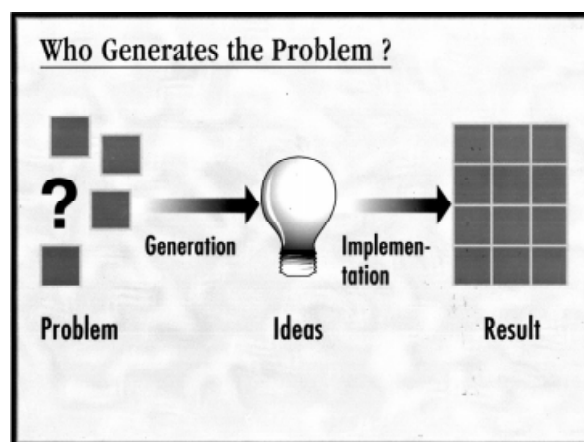


Fig. 5 Who generates the problem?

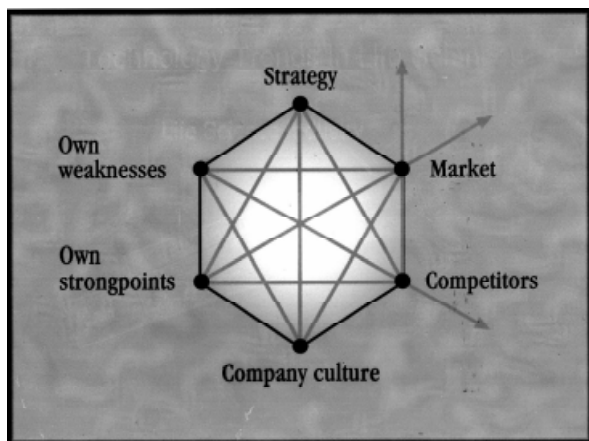


Fig. 6

lies not only in the lack of feedback loops and its neglect of what could be called the cultural aspects of innovation, but chiefly in the assumption that the problems are all around us. I would like to make the case that we have a highly advanced problem-solving system in our research laboratories, but a primitive problem selection process. The mindless application of this problem solving ability to problems of low value leads to the situation summarized in the following bit of folk wisdom: 'It is easier to make research from money than money from research.'

Figure 6 is a depiction of the morphology of the problem finding process. The complexity of the diagram reminds us that this process is still one of judgement rather than a mechanical one that can be applied by formula.

## Project evaluation

The quality of a project can be represented by the following equation:

$$Q = M \cdot F \cdot L \cdot [a + b + c \dots]$$

*M*: Market 'Why does customer X order quantity *q* for price *y*?'

*F*: Financial 'Can we afford it?'

*L*: Legal 'Will it be allowed?'

If any of the dominant factors, *M*, *F* or *L*, is zero the whole equation is zero. Each of these factors can be influenced, as can the qualifications *a*, *b*, *c*. The latter are factors such as: can we produce it?, is our R&D competitive?, is there a patent problem?, etc. This is, of course, not simple mathematics. Most of the problems of life do not follow classic mechanics, but rather the mathematics of fractals. The issue of the time horizon of projects is an important one. Two statements can be made on this subject:

\*In a life science chemical company more probably 0.1 to 0.01%.

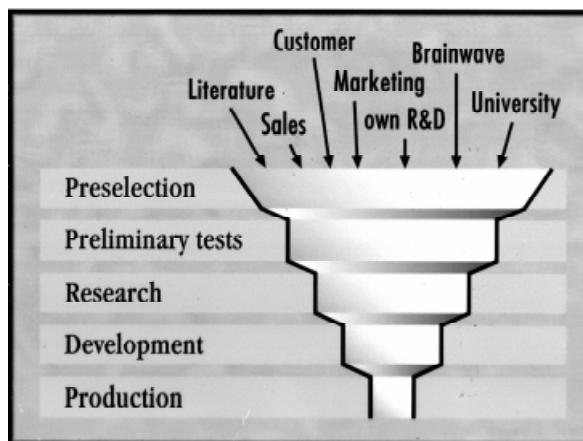


Fig. 7

- Most industrial corporations die, if they have only short-term goals
- Most well established and wealthy corporations, who generally foster and subsidize only long-term projects, die as well.

It is not easy to find a reasonable and affordable mix of long and short-term projects.

I have emphasized the importance of finding new project ideas. Figure 7 depicts the classic notion of product development. A continuous and large flow of new ideas from within and without the corporation is pre-selected, tested, gone through R&D and finally 1 or 5% reach the stages of production and sales.\* Figure 8 shows an all too common actual inverted funnel. Because of a permanent demand for funds, the R&D capacity has expanded—but there are no really good project ideas (especially for government-funded research). How do people feel in this system? They are generally very busy—most even medium-happy. Except the real innovators, who quit. However, the rest organize, structurize, administrate, write reports—and ask for higher salaries. Not many brilliant ideas reach the relatively large laboratories. Too many risky, too

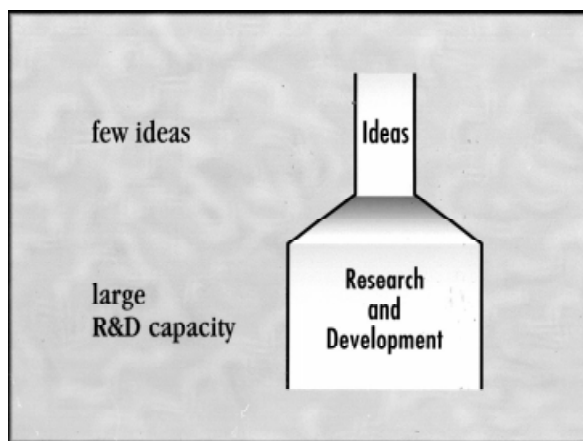


Fig. 8

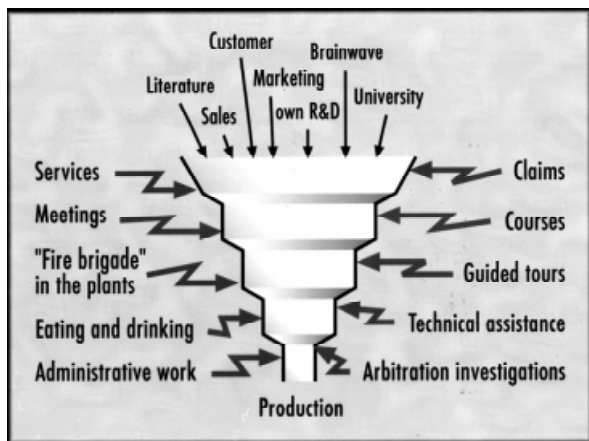


Fig. 9

### Elements of a well-organized and orderly R&D System

- Motivated co-workers
- An expedient organization
- A clearly structured project procedure
- Interdisciplinary teams
- A functioning infrastructure
- Permanent education
- Project leaders

Fig. 10 Elements of a well-organized and orderly R&D system.

long-term or even silly ideas have to be pursued, and spoil even the reputation of excellent R&D. The major and most difficult question, 'what should we invent?' remains unanswered, the 'how to invent' is now a widespread art in most laboratories. The methodology of idea generation remains the important question.

### Interference Centers

- "Project Champions"
- Emergency situations, stress
- Lack of work, boredom
- Contacts over sector boundaries
- Coffee table conversations
- "Playcorners" for researchers
- Customer contacts

Fig. 11 Inference Centers.

## Creating an innovative climate

Another funnel, shown in Figure 9, describes the activities of many large laboratories. The wonderful capacity of an R&D organization is eaten up by paper production, red tape, controlling, and a lot of other nonsense. Instead of new products and new production processes, we get paper, brochures and presentations. The real yield drifts to almost zero. From this we may conclude that the best people, the best laboratories and the best organization alone do not mean a creative and productive atmosphere. Figure 10 shows the elements of a well-organized R&D system. This is a wonderful system, but it doesn't work. An organization always has to be challenged, shaken up. I would like to call this interference centers (Fig. 11).

Chaos has been proposed as the real type of organization, but all experiments show that it does not work either. We need clean laboratories, precise analysis, glass-clear analysis and precise recording. This leads to the conclusion that only the interference of a dual system, well-organized and orderly R&D and interference centers (chaos) lead to results.

### What does Industry need from the State?

1. A good high school education
2. University education
3. Permanent education
4. University Research
5. Research, development, education at the 'infrastructural boundaries'
6. Top level research in selected crucial sectors
7. Applied research and development at engineering schools
8. Providing a helping hand with regard to technology transfer to smaller and medium-sized enterprises
9. An innovative climate

Fig. 12 What does industry need from the state?

### Interdisciplinary Sciences

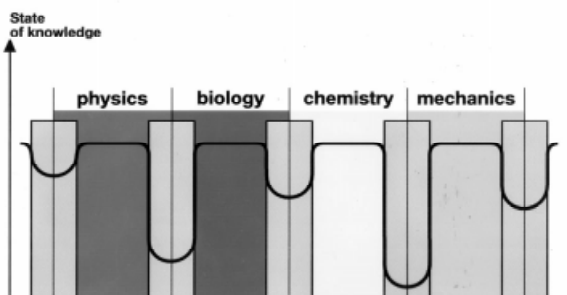


Fig. 13 Interdisciplinary Sciences.

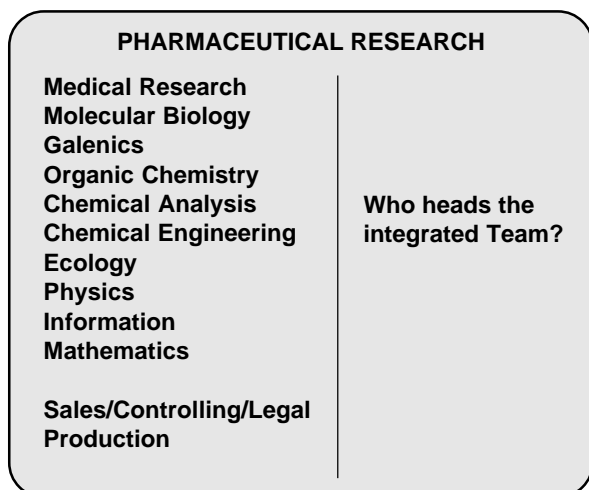


Fig. 14 Pharmaceutical research.

*'Ideas for innovation and inventions are conceived at the centers of interference in a well-organized and structured research and development apparatus.'*

### What does industry need from the state?

Figure 12 lists those things that the state can do to support industry. As you can see, these are not direct support, but rather the development of human capital and the facilitation certain kinds of technology development and technology transfer.

$$\text{Shareholder Value} = \text{Customer Satisfaction} \times \text{Employee Motivation} \times \text{Service to the Community}$$

Fig. 15

## Meeting reports

### ComTox. Commission on Toxicology (VII.4)

**Unconfirmed Minutes of the Commission Meeting. Geneva, IUPAC General Assembly. 23–26 August 1997.**

Minutes prepared by: Birger Heinzow and Rita Cornelis.  
Dr John Duffus reported about the International Semi-

### Interdisciplinary Sciences

Future developments will more often take place at the interfaces of traditional disciplines. Figure 13 shows, in a schematic way, the state of knowledge about those interfaces. The interface of biology and chemistry is well developed, while the interfaces between physics and biology and chemistry and mechanics are relatively underdeveloped. As a practical example of the reality of interdisciplinary research, we can look at the disciplines needed to conduct pharmaceutical research. Figure 14 is a list, which is probably incomplete, of the members of the ideal Pharmaceutical Research team. One essential question, *who* heads the integrated team?

### Shareholder value

I would like to return to the question implicitly raised at the beginning of this discussion. What constitutes shareholder value? This is a topic that can generate more heat than light. I would like to pose it in a slightly different way. How does a company generate shareholder value? Most business leaders would talk about providing a good (excellent) return on investment. That is, in my view, a result. How does the company accomplish this? Figure 15 is another conceptual equation to show what I propose are the necessary components for the creation of shareholder value. If these three factors can be optimized, shareholder value will be optimized. You will note that a return on investment does not appear in this equation. Economical results are derived from customer satisfaction, which can only be achieved through employee motivation and service to the community.

nar on Assessment of Carcinogenic Risk from Occupational Exposure to Inorganic Substances, Luxembourg, 17–20 October 1995. The publication of the proceedings is now being organized by the Royal Society of Chemistry and will be published later this year.

### Recommendations for the biological monitoring of VOCs

Coordinators: Drs Jakubowski, Regine Heinrich-Ramm

and Heinzow.

A revised and shortened draft, prepared by Dr Heinrich-Ramm and Dr Heinzow, was presented and discussed within the working party. As the outcome of the fruitful discussion, specific tasks were assigned and will be sent to Dr Heinrich-Ramm by the end of September.

A further meeting was regarded as necessary for the final discussion. It was proposed that the meeting of the members of the working party be on 21–23 November 1997. Funding was requested from the Division. (Participants: Drs Aitio, Jakubowski, Molin Christensen, Heinzow, Olsen and Heinrich-Ramm).

### **Calculation and application of coverage intervals for biological reference values**

The manuscript prepared by O.E. Poulsen, E. Holst, J.M. Christensen has been published in PAC as a technical report (*Pure Appl. Chem.* 1997, **69**, 1601-1611). A computer program will be made available by Dr Christensen upon request.

### **Decision rules in compliance testing for implementation of exposure limits**

Coordinator: Dr J.M. Christensen and E. Olsen

A revised version focusing on human health was circulated by Dr Christensen. Additional input was obtained from the ISO. The project will be completed by 1999.

### **Risk assessment group**

Working group: Drs Duffus, J.M. Christensen, E. Olsen and R. Herber

A first meeting of the exploratory working party was held in Amsterdam in 1996 and in 1997 in Stockholm. The problems of terminology were discussed.

Dr Duffus has prepared a first draft for teaching risk assessment. The project will mainly focus on the occupational environment and will be prepared as educational material.

Dr Duffus proposed as an additional project: risk assessment for inhalation of particulate matter (especially for metal). International input for the working party (e.g.) Fraunhofer Inst. Hannover (D) will be established.

The Commission recommended these proposals to become projects for the next two year. Cooperation with ICPS will be sought and was welcomed by Dr Mercier, director of IPCS.

### **Recommendations for exposure assessment using a logbook method.**

Coordinator: E. Olsen

Erik Olsen reported that the logbook project will be based on papers circulated previously. He gave a report on the basic methodology. Dr Rappaport is a co-worker. The paper will be revised soon.

### **Combined effects of drugs and toxic agents. Recommendations for study design, methods, evaluation and nomenclature.**

Coordinators: Drs G. Poech and B. Heinzow

Dr Heinzow outlined the status of the project. A first draft has been presented by Dr Poech. The approach to use dose–response curves as the basis for a description of combined effects was supported. Examples should be given, a software package is available by Dr Poech. The project will be completed within the next two years.

A new project presented by O. Hertel (DK): Modelling of human exposure to outdoor air pollution, was accepted by the commission. It was recommended to include practical examples. A computer program will possibly be made available for use of exposure assessment. This activity was received with great interest also by Dr Mecier (IPCS). Co-operation with Division VI (Chemistry and the Environment), Commission on Atmospheric Chemistry, was established.

### **Cooperation within IUPAC**

Analytical Chemistry Division, Commission on Microchemical Techniques and Trace Analysis, Division VI, Chemistry and the Environment, Commission on Fundamental Environmental Chemistry, and Division VII Chemistry and Human health, Commission on Toxicology.

Dr Cornelis and Dr Templeton represented ComTox. Working definitions on speciation were agreed upon and distributed. A manuscript: 'Terms related to speciation of trace elements' following the results of the discussion in Guildford and Ispra is under preparation.

A document co-ordinated by Dr Cornelis should be ready by November

Future co-operation on the project: 'Speciation analysis of biomolecules by hyphenated techniques' is planned with V.C2. Co-ordinator is Dr Ryszard Lobinski.

Future co-operation with CTC may focus on educational programs on toxicology for chemistry students and for school teachers

It was recommended that an abbreviated version of the textbook on Toxicology be prepared and a curriculum for a training course for chemists and chemistry school teachers on Toxicology be developed. It was recommended that questions and answers put forward most often to school teachers by students and the public be included.

*Project: Abbreviated textbook: 'Introduction to toxicology'*

Coordinator: Dr Duffus and Dr Worth; B. Heinzow, R. Herber, J. M. Christensen, D. Templeton. Co-operation will be sought with WHO.

#### *Committee on Quantities and Units*

The manuscript: 'Properties and Units in the clinical laboratory sciences, XI. Properties and Units in Trace Elements', by Rita Cornelis, X. Fuentes, I. Brunshuis and D. Templeton was finalised and will be published in *PAC, Clin. Chim. Acta* and *Eur. J. Clin. Chem. Clin. Biochem.*

A new project: 'Metrological nomenclature in toxicology' will be co-ordinated by Drs X. Fuentes, R. Cornelis and J. M. Christensen.

#### *Co-operation and exchange of expertise will continue*

Contacts were established to the Chemistry and the Environment Division, Commission on Food Chemistry. Possible projects and future topics were presented by Dr Elke Anklam, M. Miraglia and C. Brera.

As a possible joint project: 'Review of endocrine disruptors in foodstuff and its health implications' was agreed. This project might also become part of the planned White Book on Endocrine Disruptors. This matter will be discussed within the Divisions, whether to include the project as a chapter in the white book or to initiate a separate project.

A discussion on metals in food was initiated and Dr Templeton will contact Dr Szeke (PL).

#### **Cooperation with other scientific bodies**

Cooperation with WHO and IPCS on risk assessment will continue and be intensified. It was recommended that Dr Cornelis be nominated as liaison to IPCS. Dr Mercier attended the Commission meeting and gave an overview of IPCS activities. The input by ComTox was very much welcomed and the discussion for a training course on toxicology will be further explored.

#### **Next meeting of the commission**

The next venue will be in Edinburgh in September 1998. Dr Duffus will be the local organizer.

#### **Summary of the minutes of the meeting of the Commission on Molecular Structure and Spectroscopy (I.5) at the IUPAC General Assembly, Geneva, Switzerland 24–27 August 1997**

Fifteen members of the Commission on Molecular Structure and Spectroscopy (I.5), including national

representatives and observers, met for three days of hard work during the 39th General Assembly in Geneva, Switzerland, with little time for admiring the beautiful setting on the Lac Lemman and the famous Geneva fountain. Three new Titular Members, Robin S. McDowell, Noboru Hirota and James E. Boggs, and three Associate Members, Soji Tsuchiya, Qing-Shi Zhu and Paul von Rague Schleyer were elected to the Commission. Four new national Representatives were appointed, Profs P.T. Manoharan (India), J.P. Hawranek (Poland), B.J. Van der Veken (Belgium), and R. Janoschek (Austria).

Several projects were completed and the results published in *Pure Appl. Chem.* (PAC): C.L. Wilkins, *Guidelines on Nuclear Magnetic Resonance Computerized Databases*, PAC 1995, **67**, 593; A.M. Bradshaw and N.V. Richardson, *Symmetry, Selection Rules and Nomenclature in Surface Spectroscopy*, PAC 1996, **68**, 457; G. Guelachvili and 23 collaborators., *High Resolution Wavenumber Standards for the Infrared*, PAC 1996, **68**, 193, and this paper was also reprinted in *J. Molec. Spectrosc.* 1996, **177**, 164 and *Spectrochim. Acta* 1996, **52**, 717; C.J.H. Schutte, J.E. Bertie, P.R. Bunker, J.T. Hougen, I.M. Mills, J.K.G. Watson and B.P. Winnewisser, *Notations and Conventions in Molecular Spectroscopy part 1. General Spectroscopic Notation*, PAC 1997, **69**, 1633; C.J.H. Schutte, J.E. Bertie, P.R. Bunker, J.T. Hougen, I.M. Mills, J.K.G. Watson and B.P. Winnewisser, *Notations and Conventions in Molecular Spectroscopy part 2. Symmetry Notation*, PAC 1997, **69**, 164; P.R. Bunker, C.J.H. Schutte, J.T. Hougen, I.M. Mills, J.K.G. Watson and B.P. Winnewisser, *Notations and Conventions in Molecular Spectroscopy part 3. Permutation and Permutation-Inversion Symmetry Notation*, PAC 1997, **69**, 1651.

The following book has been published: J.E. Bertie, C.D. Keefe and R.N. Jones, *Tables of Intensities for the Calibration of Infrared Spectroscopic Measurements in the Liquid Phase*, 263 pp., Blackwell, 1995. A joint article from Commissions I.5 and V.4 describing the work in the two commissions has been published in *Applied Spectroscopy* 1996, **50**, 12A: J.E. Bertie and T. Vo-Dinh, *Spectroscopy Commissions of the International Union of Pure and Applied Chemistry*.

Other articles were, in press or the projects were very close to completion: R.K. Harris, J. Kowalewski and S. Cabral de Menezes, *Parameters and Symbols for Use in Nuclear Magnetic Resonance*, PAC, in press; E.D. Becker, W. Bremser, S. Cabral de Menezes, R. Goodfellow, P. Granger and R.K. Harris, *Recommendations for NMR Nomenclature A. Nuclear Spin Properties and Conventions for Chemical Shifts*; and J.E. Bertie, *Specification of Components, Methods and Parameters in Fourier Transform Spectroscopy by Michelson and Related Interferometers*. The latter paper has been divided into one part for modest resolution spectroscopy

( $0.1\text{ cm}^{-1}$  or less) and one for high resolution spectroscopy ( $10^{-3}\text{ cm}^{-1}$  or better). In addition, a part pertaining to FT-Raman spectroscopy is included. The following manuscript of a book was approved in Geneva: E. Hirota, R.W. Field, J.P. Maier and S. Tsuchiya, editors, *Non-linear Spectroscopy for Molecular Structure Determination*. It constitutes a monograph of 268 pages and 10 chapters, probably suitable both for teaching and as a reference book to nonlinear spectroscopy. The book will be published by Blackwell early in 1998.

Projects from the Sub-Committee on Theoretical Chemistry are in progress: *Guidelines for Presentation of Methodological Choices in the Publication of Computational Results*, A. *ab initio* Electronic Structure Calculations (Project leader J.E. Boggs). The paper was approved by the Commission for immediate publication. A draft for semiempirical calculations is in progress (part B) and should be completed in two years. A third paper (part C) is planned to deal with computation of large molecules by molecular mechanics. An extensive report comprising 194 compounds was presented to the Commission for discussion and suggestion: R. Janoschek, *The Quantum Chemical Computation of Structures and Properties of Small Experimentally Known Molecules I. Diatomic Molecules for H-Ar*. It was agreed that the project would be completed following consultations with an international group of specialists.

Various new projects were initiated: *Notations and Conventions in Molecular Spectroscopy. Part 4. Vibrational-Rotational Spectroscopy* (Project leaders R.S. McDowell and J.K.G. Watson); *Notations and Conventions in Molecular Spectroscopy. Part 5. Electronic-Vibrational-Rotational Spectroscopy* (Project leaders J.K.G. Watson and R.S. McDowell). The Commission approved both these projects. Another proposed project was also approved: *Quantities, Terminology and Symbols in Photothermal and Related Spectroscopies* (Project leaders N. Hirota and M. Terazima); these methods are very sensitive and of increasing importance in applied science. R.K. Harris successfully sought approval-in-principle for a project to recommend *Nomenclature for tensor quantities used in NMR, NQR and ESR Spectroscopies* (Project leader R.K. Harris); formal IUPAC approval for this project will be sought when the working party members have been recruited and the goals have been more precisely formulated.

Joint meetings were held between Commission I.5 and three other commissions: Commission V.4 (Commission on Spectrochemical and Other Optical Procedures for Analysis) of the Analytical Division; Commission I.3 (Commission on Electrochemistry) and Commission I.1 (Physicochemical Symbols, Terminology and Units). With each of these commissions various projects of common interests were discussed. These

joint meetings are very important to avoid overlap between projects of different commissions and to provide stimulation for joint projects of greater breadth than is usually achieved by a single commission. In particular, the meetings in Geneva gave good ideas to both parties about new proposals and cooperation on existing projects. With Commission I.1 it was agreed on additions and alterations which should be included in the next edition of The Green Book (Quantities, Units and Symbols in Physical Chemistry).

Theoretical chemistry plays an ever increasing role in chemistry and the Subcommittee on Theoretical Chemistry; which was established at the General Assembly in Guildford, continues with its chairman Professor James E. Boggs. The subcommittee is strengthened with five new members. The Subcommittee on Notations and Conventions for Molecular Spectroscopy has a new chairman Dr J.K.G. Watson, and Dr Robin S. McDowell and Professor Jean-Marie Flaud will join the subcommittee.

The commission discussed the use of the World-wide Web and it was suggested that a Home Page be established. However, no decision was made concerning the content and who should be responsible for the Web site.

The chairman, John E. Bertie, expressed his thanks to the outgoing members for their contributions to the work of Commission I.5 and looked forward seeing the members at the next IUPAC General Assembly to be held in Berlin in August 1999.

**Peter Klæboe**  
**(Secretary of Commission I.5)**

## Latin American Workshop on Mycotoxins—methods of analysis

Food Chemistry Commission WPAC project: 650/88/96 (Working Group: Mycotoxins)

Coordinator(s): M. Sabino (local), J. Gilbert, E. Sydenham and H. van Egmond

This workshop was held in São Paulo (Brazil) at the Instituto Adolfo Lutz, from 18 to 22 November 1996. Dr Myma Sabino was responsible for the local organization. The workshop was sponsored by ILSI Brazil, FAPESP, Instituto Adolfo Lutz and IUPAC. Additional funding was provided by industry. Eighty participants from four South American countries attended the workshop.

The workshop was aimed at providing training through a series of lectures from invited experts and through open discussion sessions covering methods of analysis for aflatoxins, ochratoxin A, zearalenone, patulin, trichothecenes and fissionisins. There were also a number of presentations on activities in the field of mycotoxins by participants from South America.

The workshop was evaluated by participants and

judged to have been successful and contributing strongly to spreading the IUPAC mission in the region. The success of this Workshop encouraged the organizers to bid to host the Xth IUPAC Symposium on Mycotoxins and Phycotoxins. The bid was successful, the conference will be held in São Paulo, Brazil, 22–25 May 2000.

## IUPAC CNOC—1997 Meeting—Summary

As part of the IUPAC 1997 General Assembly, the IUPAC Commission on Nomenclature of Organic Chemistry (Commission III.1—CNOC) met in Geneva, Switzerland for three full days, 24–26 August. Twenty-four people participated in some or all of the sessions. Most of the working time was spent on the P-names document, which was completed, except for editing, and adopted by the Commission. Other documents requiring only minor editing, at most, before submission to IDCNS or public review include:

- Phane Nomenclature. Part 1: Parent Hydride Names, Recommendations 1997. (Prepared for publication by W. H. Powell; O. Weissbach, coordinator.)
- Extension and Revision of the von Baeyer System for Naming Polycyclic Compounds (Including Bicyclic Compounds). (Prepared for publication by G. P. Moss.)
- Extension and Revision of the Nomenclature for Spiro Compounds. (Prepared for publication by G.P. Moss.)

Recommendations on fusion nomenclature [Nomenclature of Fused Ring and Bridged Fused Ring Sys-

tems, (Prepared for publication by G. P. Moss)] are scheduled for publication in *Pure and Applied Chemistry* in January 1998.

The Commission has now completed full review of points left pending in the *Guide*: namely, phane nomenclature (part 1), hydro/dehydro prefixes, and priority among classes of compounds. New substantive decisions on principles for the P-names document include:

- (a) Seniority order for rings and ring systems.
- (b) Seniority order for chains. This order includes <a> replacement names and a major change pertaining to compounds containing multiple carbon–carbon bonds. The longest continuous chain, with or without the multiple-bond linkage, is the parent chain.
- (c) Alkyl vs. alkanyl style names. *Alkyl* will be used when the free valence (or point of attachment) is at a terminal position of the longest chain; *alkanyl* (with locant) will be used when the free valence (or point of attachment) is at a non-terminal position on the longest chain.
- (d) Deletion of several previously retained (non-systematic) names, including isobutyl, sec-butyl, and phosgene.

No substantive decisions remain to be made by the Commission on any of its current projects, only editing of the documents before submission to IDCNS. For the next biennium, the Commission expects to work on four new projects:

- 1 Fullerene nomenclature
- 2 Stereochemistry: concepts, terms, notation.
- 3 Phane nomenclature, part II
- 4 Seniority based on CIP priorities

Prepared by James G. Traynarn, Secretary, CNOC



Meeting of the Commission on Physical Organic Chemistry in Geneva. From left to right: *Standing*—Prof. J.-L. Abboud, Prof. E. Humeres, Prof. E. Baciocchi, Dr J. R. Zdysiewicz, Prof. M. Tisler, Prof. S. Fukuwmi, Dr D. J. Raber, Prof. T. T. Tidwell, Prof. U. Sieffi, Prof. J. Shorter, Prof. S. S. Kim, Prof. R. Louw, Prof. V. I. Minkin, Prof. C. L. Perrin, Prof. P. Muller, Prof. Z. Rappoport; *Sitting*—Prof. P. Tundo, Prof. N. Nudelman, Prof. D. Lenoir, Prof. U. G. Edlund, Prof. M.-K. Ruasse, Prof. M. Oki, Prof. Y. Takeuchi.



## Summary minutes of the meeting of the Commission on Physical Organic Chemistry (III.2), Geneva (Switzerland), 24–26 August 1997

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The largest part of the meeting was devoted to the review of the status of the current projects as well as to the discussion of new projects. The Commission was pleased to find that the project *Critical Compilation of Scales of Medium Effects* can be considered finished and the project *Guidelines for Publication of Research Results from Empirical Force Field* is very close to the conclusion. The projects *Glossary of Terms Used in Theoretical Organic Chemistry* and *Glossary of Terms Used in Supramolecular Chemistry* are also well under way and their completion is expected within the next year.

Two new projects related to the environment were also discussed and approved. The first project *Reaction Pathways and Processes in Green Chemistry* was presented by Professor Tundo, the second, *Evaluation of Methods for Obtaining Physicochemical Properties of Environmentally Important Organic Compounds* by Professor Lenoir. Both projects are expected to be complete in two years. A feasibility study for a project concerning Gas-phase and Solution Data of Carbocations will be carried out by Professor Abboud. Continuing interest was shown for projects related to

materials and education. A project on biomolecular mechanisms is also under consideration.

A joint meeting with the Commission of Photochemistry (III.3) was held on 25 August. In this meeting information was exchanged on the ongoing and future projects of the two Commissions. The possibility of a joint project was also considered.

Profound changes in the Commission Membership were recorded. Professor Tidwell will leave the Commission, having been nominated Secretary of the Organic Chemistry Division Committee. From January 1st, 1998, Professor C. Perrin will be the new Chairperson of the Commission. Professors Abboud and Ruasse were proposed as Titular Members of the Commission to replace Professors Shorter and Takeuchi (completed term of service). Professors Tundo and Lenoir were proposed as Associate Members.

Before concluding its work, the Commission wished to express the most grateful thanks to Professor Tidwell for his very efficient chairmanship and to Professors Shorter and Takeuchi for their numerous effective contribution to the Commission activity.

The next series of meetings of the Commission will be held in Florianópolis (Brazil) in the occasion of the 14th IUPAC Conference on Physical Organic Chemistry (16–21 August 1998).

**Prof. T. T. Tidwell (Chair) and Prof E. Baciocchi (Secretary)**

## Recent reports

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**In this section we publish summaries of the most recent IUPAC recommendations on nomenclature and symbols and technical reports. The full texts of these recommendations and reports are published in *Pure & Appl. Chem.***

### Erratum: IUPAC recommendations on nomenclature and symbols and technical reports from commissions

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Commission on Agrochemicals and the Environment (N. K. J. Nflyamoto, G. D. Paulson, B. Zeeh, M. W. Skidmore, R. M. Hollingworth and H. A. Kuiper) Pesticides Report 37. Chirality in synthetic agrochemicals: Bioactivity and safety consideration (Technical Report) *Pure & Applied Chemistry* 1997, **69**(6), 1335–1348.

Due to a clerical error, Table 1 was omitted from this report. The report is reproduced in its entirety at the end of the September issue of *Pure & Applied Chemistry* 1997, **69**(9), 2007–2025.

### Names and symbols of transfermium elements (IUPAC Recommendations 1997)

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*Synopsis:* Revised recommendations for the names and symbols of the transfermium elements (atomic numbers 101–109) are presented along with the reasons for proposing them.

#### Introduction

The recommendations (ref. 1) of the Commission on Nomenclature of Inorganic Chemistry (CNIC) on the nomenclature of the transfermium elements (101–109, inclusive) were considered by the IUPAC Bureau at Guildford (UK) in September 1995. As a result of the various criticisms of the recommendations and the way

that they had been processed, the Bureau decided to adopt the recommendations as provisional and to circulate them to national/regional nomenclature centres in the normal way, with notices to be published in national/regional chemistry journals and magazines, requesting submission of comments to CNIC. In particular, the National Adhering Organizations (NAOs) were invited to express their views concerning the extant proposals for the names of these elements and the principles and traditions used to derive them. The response from the general chemical community was small, and the bulk of the replies came from nuclear scientists.

## Recommendations

The Commission reconsidered all the names at a meeting in Chestertown, Maryland (USA) in August 1996. Although it is accepted that the discoverers of a new element have the right to propose a name and that such suggestions must receive serious consideration, it is also accepted that the final decision in such matters should be taken by CNIC, and ultimately confirmed by the Interdivisional Committee on Nomenclature and Symbols, Bureau, and Council of the Union. At Chestertown, CNIC reiterated its acceptance of the conclusions of the Transfermium Working Group (TWG) as a basis for taking decisions (refs. 2–4). However, it also decided to modify its decision that the name of a living scientist should not be used as the basis for an element name. The responses from the NAOs and the chemical community showed quite clearly that chemists in general do not regard this as an important issue and many thought it irrelevant. The Commission agreed, in keeping with tradition, to the use of appropriate names derived from (a) mythical concepts or characters, (b) place, area or country, (c) a property of the element, and (d) a scientist.

After some discussion CNIC agreed that elements 101, 102 and 103 should retain their commonly accepted names mendelevium, nobelium, and lawrencium. This is despite the fact that the original Swedish claim to have prepared element 102 was subsequently shown to have been in error by the Dubna laboratory, which finally achieved an undisputed synthesis. The discovery of element 106 by the Berkeley laboratory is uncontested and the name proposed by the discoverers, seaborgium, was accepted. The discoveries of elements 107 jointly by the Darmstadt and Dubna laboratories), and of 108 and 109 (by the Darmstadt laboratories) are also uncontested. The discoverers wished to call these nielsbohrium, hassium, and meitnerium, respectively, and the Commission accepted the last two. However, the proposal for 107 was the subject of vigorous debate. The name nielsbohrium is long and includes the first name of Niels Bohr as well

as his family name. Such an element name is without precedent. Finally it was decided to refer the matter to the Danish NAO. Its preference for bohrium rather than nielsbohrium was ultimately accepted.

The discoveries of elements 104 and 105 are contested by Dubna and Berkeley. Both laboratories appear to have made significant contributions, but what has clearly emerged from the submissions, including those from Berkeley and from Darmstadt, is that the Dubna laboratory has played a key role in developing the experimental strategies used in synthesizing several transfermium elements. The Commission recommended that element 105 should be named dubnium in its honour. The Berkeley laboratory has already been similarly recognized on more than one occasion. Finally, the Commission accepted the name rutherfordium for element 104, to honour the New Zealand nuclear physicist, Ernest Rutherford.

The agreed list of recommendations is as follows:

Element	Name	Symbol
101	mendelevium	Md
102	nobelium	No
103	lawrencium	Lr
104	rutherfordium	Rf
105	dubnium	Db
106	seaborgium	Sg
107	bohrium	Bh
108	hassium	Hs
109	meitnerium	Mt

The Commission benefited from the presence of a representative of the International Union of Pure and Applied Physics (IUPAP) at its meeting in Chestertown. It is to be hoped that such a person will always be available if needed, and the Commission believes that it will be important to revive a joint IUPAC–IUPAP Working Group to confirm the discovery of new elements and to adjudicate on competing claims for priority of discovery. The Commission hopes that the present collection of names will be accepted as a fair compromise between the various claims and suggestions. It recognizes important experimental and theoretical contributions to the discovery of new elements and also the international nature of our science.

## References

1. *Pure Appl. Chem.* 1994, **66**, 2419–2421.
2. *Pure Appl. Chem.* 1991, **63**, 879–886.
3. *Pure Appl. Chem.* 1993, **65**, 1757–1763.
4. *Pure Appl. Chem.* 1993, **65**, 1764–1814.

*This report was prepared for publication by the Commission on Nomenclature of Inorganic Chemistry, Inorganic Chemistry Division. The full details are to be found in Pure Appl. Chem. 1997, 69, 2471–2473.*

## Nomenclature of glycolipids (IUPAC Recommendations 1997)

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#### GL-1. General considerations

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### GL-1. General considerations

Glycolipids are glycosyl derivatives of lipids such as acylglycerols, ceramides and prenols. They are collectively part of a larger family of substances known as glycoconjugates. The major types of glycoconjugates are glycoproteins, glycopeptides, peptidoglycans, proteoglycans, glycolipids, and lipopolysaccharides. The structures of glycolipids are often complex and difficult to reproduce in the text of articles and certainly cannot be referred to in oral discussions without a nomenclature that implies specific chemical structural features.

The 1976 recommendations on lipid nomenclature

contained a section (Lip-3) on glycolipids, with symbols and abbreviations as well as trivial names for some of the most commonly occurring glycolipids. Since then, more than 300 new glycolipids have been isolated and characterised some having carbohydrate chains with more than twenty monosaccharide residues and others with structural features such as inositol phosphate. The nomenclature needs to be convenient and practical, as well as extensible, to accommodate newly discovered structures. It should also be consistent with the nomenclature of glycoproteins, glycopeptides and peptidoglycans, oligosaccharides, and carbohydrates in general.

This document supersedes the glycolipid section in the 1976 Recommendations on lipid nomenclature.

*This report was prepared for publication by M. Alan Chester (Blood Centre, University Hospital, S-221 85 Lund, Sweden), for the Joint Commission on Biochemical Nomenclature. The full details are to be found in Pure Appl. Chem. 1997, 69, 2475–2487.*

### Parameters and symbols for use in nuclear magnetic resonance (IUPAC Recommendations 1997)

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*Synopsis:* NMR is now frequently the technique of choice for the determination of chemical structure in solution. Its uses also span structure in solids and mobility at the molecular level in all phases. The research literature in the subject is vast and ever-increasing. Unfortunately, many articles do not contain sufficient information for experiments to be repeated elsewhere, and there are many variations in the usage of symbols for the same physical quantity. It is the aim of the present recommendations to provide simple check-lists that will enable such problems to be minimised in a way that is consistent with general IUPAC formulation. The area of medical NMR and imaging is not specifically addressed in these recommendations, which are principally aimed at the mainstream use of NMR by chemists (of all sub-disciplines) and by many physicists, biologists, materials scientists and geologists etc. working with NMR.

The document presents recommended notation for use in journal publications involving a significant contribution of nuclear magnetic resonance (NMR) spectroscopy. The recommendations are in two parts:

A. Experimental parameters which should be listed so that the work in question can be repeated elsewhere.

B. A list of symbols (using Roman or Greek characters) to be used for quantities relevant to NMR.

This report was prepared for publication by Robin K. Harris<sup>1</sup>, Jozef Kowalewski<sup>2</sup> and Sonia Cabral De Menezes<sup>3</sup> (<sup>1</sup>Department of Chemistry, University of Durham, South Road, Durham DH1 3LE, UK; <sup>2</sup>Division of Physical Chemistry, Arrhenius Laboratory, Stockholm University, S-10691 Stockholm, Sweden; <sup>3</sup>PETROBRAS/CENPES, Divisão de Química, Ilha do Fundão, Quadra 7, Cidade Universitária, 21949 900 Rio de Janeiro, R.J., Brazil), of the Commission on Molecular Structure and Spectroscopy, Physical Chemistry Division. The full details are to be found in Pure Appl. Chem. 1997, **69**, 2489–2495.

### Compilation and critical evaluation of structure–reactivity parameters and equations: Part 2. Extension of the Hammett $\sigma$ scale through data for the ionization of substituted benzoic acids in aqueous organic solvents at 25 °C (Technical Report)

*Synopsis:* Data have been compiled for the pK values in certain aqueous organic solvents at 25 °C of about 70 *meta*- or *para*-substituted benzoic acids, with a view to proposing values of Hammett constants,  $\sigma$ , in the case of substituents for which values cannot be based on the ionization of substituted benzoic acids in water (Part 1). The emphasis of the work is on the use of data for the apparent pK values of the acids in 1:1-EtOH-H<sub>2</sub>O, i.e. a solvent made up of equal volumes of ethanol and water. A calibration equation is derived relating substituent effects measured in this solvent to those measured in water. On the basis of this equation  $\sigma$  values are proposed for 25 substituents, although some of the values are subject to *caveats*, and several further substituents are also discussed.

This report was prepared for publication by: John Shorter (School of Chemistry, University of Hull, Hull HU6 7RX, UK), for the Working Party on Structure–Reactivity Parameters and Equations of the Commission on Physical Organic Chemistry, Organic Chemistry Division. The full details are to be found in Pure Appl. Chem. 1997, **69**, 2497–2510.

### Source-based nomenclature for non-linear macromolecules and macromolecular assemblies (IUPAC Recommendations 1997)

*Synopsis:* A source-based nomenclature for non-linear macromolecules and macromolecular assemblies is proposed. Source-based or structure-based names for linear regular (single-strand and double-strand) and irregular macromolecules can be derived using rules published previously. In contrast, the present document deals with the source-based naming of non-linear macromolecules and assemblies of macromolecules. The former comprise branched, graft, comb, star, cyclic and network macromolecules; the latter comprise polymer blends, interpenetrating polymer networks and polymer-polymer complexes. The names of non-linear macromolecules are formed by citing source-based name(s) of the constituent linear chains(s) and denoting their mode(s) of combination by prefixes and connectives. Specification of molecular weight, composition or branch-point functionality(ies) of the macromolecule or its constituents may be given, in parentheses.

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- 4 Non-linear copolymer. molecules
  - 4.1 Copolymer molecules comprising a single species of linear chain...
  - 4.2 Copolymer molecules comprising a variety of species of chains...
- 5 Macromolecular assemblies
- 6 Quantitative specifications
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This report was prepared for publication by: J. Kahovec (Czech Republic), P. Kratochvíl (Czech Republic), A. D. Jenkins (UK), I. Mita (Japan), I. M. Papisov (Russia), L. H. Sperling (USA) and R. F. T. Stepto (UK). For the Commission on Macromolecular Nomenclature, Macromolecular Division. The full details are to be found in Pure Appl. Chem. 1997, **69**, 2511–2521.

# Conference report

## 27th International Vacuum Microbalance Techniques Conference 16–18 July 1997, UMCS Lublin, Poland

Poland was the first country in Central Europe to host one of the series of *International Vacuum Microbalance Techniques Conferences*, the 27th, in 1997. The Thermal Analysis Group in the newly created Department of Physical Chemistry of Solid State (Department of Physical Chemistry, Chemistry Faculty, Maria Curie-Skłodowska University in Lublin) organised the Conference. Joint sponsors of this conference were the Polish Chemical Society, Science Society of Lublin and Polish Society of Calorimetry and Thermal Analysis. The conference was also sponsored by IUPAC, BKM Mainz (Germany) and 17 different companies from Lublin (Poland).

Seventy participants from 10 countries (Argentina, England, Germany, Netherlands, Hungary, Italy, Poland, Russia, Spain, Ukraine) and 5 exhibitors of scientific apparatus (C.I. Electronics Ltd, England; Mettler-Toledo, Warsaw; Perkin Elmer, Warsaw; Projekt & Montat - TA Instruments, Warsaw; TAK Poland, Warsaw) took part in the 27th IVMT Conference.

Unfortunately, just before the start of the conference more than a dozen potential participants cancelled their participation because of disastrous floods in Poland, the Czech Republic and Germany. Because of this, the conference program was slightly changed. A number of pio-

neers and specialists in microbalance vacuum techniques and thermal analysis (Th. Gast, Germany; F. Paulik, Hungary; J.A. Poulis, Netherlands; E. Robens, Germany, J.C. Bazan, Argentina; V.A. Tertykh, Ukraine; V.I. Bogillo, Ukraine and L. Stoch, S.L. Randzio, W. Rudzifiski, W. Brzyska, S. Halas, R. Leboda, G.W. Chadzynski from Poland) took part in the conference.

The opening ceremony was attended by: M.C.-Skłodowska University Rector—Kazimierz Goebel, M.C.-Skłodowska University v-Rector—Zbigniew Krupa, Chemistry Faculty v-Dean—Jan Rayss, Chairman of the International Steering Committee—Erich Robans, IUPAC Representative—Adam Hulanicki and Conference Chairman—Piotr Staszczuk.

The chairpersons of the plenary sessions and meeting of the International Steering Committee were:

- I A. Hulanicki (Poland) and L. Stoch (Poland),
- II W. Brzyska (Poland) and G.W. Chadzynski (Poland),
- III F. Paulik (Hungary) and Th. Gast (Germany),
- IV J. A. Poulis (Netherlands) and J.C. Bazan (Argentina),
- V C. Pesquera (Spain) and S.L. Randzio (Poland),
- VI S.V. Tertykh (Ukraine) and S. Halas (Poland) and
- VII E. Robens (Germany).

The opening lecture was presented by: Th. Gast (Germany),

The six plenary lectures were presented by F. Paulik (Hungary), E. Robens (Germany), L. Stoch (Poland),



Opening ceremony. From the right: Adam Hulanicki—IUPAC representative. Erich Robens—Chairman of the International Steering Committee; Kazimierz Goebel—M. C.-Skłodowska University Rector-Welcome and introduction; Zbigniew Krupa—M. C.-Skłodowska University v-Rector; Jan Rayss—Chemistry Faculty v-Dean; Piotr Staszczuk—Conference Chairman.



Prof. Ferenc Paulik's plenary lecture. Chair persons: Prof. L. Stoch and Prof. A. Hulanicki (on the left).

S.L. Randzio (Poland), Z. Ali (England), G.W. Chadzynski (Poland). There were an additional 18 lectures and 31 posters.

The topics of the conference included measurement of the change of sample mass loss in vacuum and in a controlled atmosphere, balance history and modern technical studies and applications, thermal analysis and its special techniques and applications, sorption measurements, chemical reactions and phase transitions. The participants presented new and pioneer methods, results and practical applications of the microbalance techniques and special thermal analysis methods. The



Conference welcome social at Stary Tartak near Koziowka. M. C.-Sklodowska University Popular Dance Group sing the Hungarian song for Prof. F. Paulik and his wife.

results of the studies of important materials (adsorbents, zeolites, superconductors, minerals and new chemical compounds) by means of new apparatus and their theoretical interpretation were presented. During the plenary and poster sessions there were many discussions, exchanges of opinions and papers and many new contacts and plans for co-operation were made.

The conference was summarized by the Chairman of the International Steering Committee—Erich Robens. The 28th IVMT Conference will take place in Kiev (Ukraine) in 1999 and 29th RMT Conference in Middlesbrough (UK) in 2001. Erich Robens was confirmed as Chairman of the International Steering Committee and Grzegorz Chadzyfiski (Wroclaw, Poland), Piotr Staszczuk (Lublin, Poland) and Amara Jayaweera (Middlesbrough, UK) were elected as vice-Chairmen. Information about the 27th IMT Conference was published on the Internet and on local Lublin radio and TV. The proceedings will appear as a special issue of the *Journal of Thermal Analysis* (1998).

I would like to mention with gratitude the work of the Science and Organizing Committee members. Meetings took place in an excellent, friendly atmosphere. Three excursions allowed the participants to see the historic town and some of the lovely countryside. The Organizing Committee received many letters from participants congratulating it on a successful international event.

**Piotr Staszczuk**  
Conference Chairman

## News

### Professor Mthembeni 'Mac' Zulu

It is with sad regret that we have to inform you of the passing of Professor Mthembeni 'Mac' Zulu. He died in a head-on collision on the 18th October 1997. He was a member of Commission II.2. The funeral was on 25th October.

### 1998 Wolf Prize in Chemistry

Jerusalem—Professors Gerhard Ertl of the Fritz-Haber Institute, Max-Planck Gesellschaft, Berlin, and Gabor A. Somorjai, of the University of California and the Lawrence Berkeley Laboratory, Berkeley, were named the 1998 Wolf Prize winners in Chemistry for their outstanding contributions to the field of surface science.

The Israel-based Wolf Foundation announced today that both distinguished scientists will share the \$100 000 award for their elucidation of fundamental mechanisms of heterogeneous catalytic reactions at single crystal surfaces.

Gerhard Ertl, born 1936, and Gabor A. Somorjai, 1935, have laid the foundation of our present conceptual understanding of catalyzed chemical reactions at surfaces, of enormous importance in industrial technology as well as basic science. Modern surface technologies are applied in many industrial processes such as chemical catalysis, electronics, lubrication, and materials science. Efficient surface catalysts help as well to sustain a clean environment by promoting reactions which destroy toxic pollutants.

Gabor A. Somorjai, has been Professor at the Univer-

sity of California, Berkeley, and Senior Scientist of the Materials Science Division, at the Lawrence Berkeley Laboratory, since 1994. Born in Budapest, he received his BSc from the Technical University, Budapest, and PhD from the University of California in 1972. He is a member of the National Academy of Sciences, USA, of the American Academy of Arts & Sciences, and a Fellow of the Academy of the Physical Society.

Professor Gerhard Ertl, born in Stuttgart, has been associated with the Fritz-Haber Institute of the Max-Planck Gesellschaft, Berlin, since 1988. He received his Ph.D. from the Technical University München, after attending the Technical University of Stuttgart and the University of Paris. He is Honorary Professor of the Free and the Technical Universities of Berlin, was Director of the Institute of Physical Chemistry, University of München, and visiting Professor at the California Institute of Technology, and University of California, Berkeley.

The Wolf Prizes were presented on 10 May 1998 by the President of Israel, Ezer Weizman, at the Knesset (Parliament) building in Jerusalem. Annual awards of \$100 000 in each category are made for outstanding achievements in Agriculture, Mathematics, Medicine, Physics, the Arts, as well as Chemistry.

The previous Wolf Prize in Chemistry was awarded to Gilbert Stork, Professor Emeritus of Columbia University, New York, and Professor Samuel J. Danishevsky, Director of the Laboratory for Bio-organic chemistry of the Memorial Sloan-Kettering Cancer Center, New York. Since 1978, 175 laureates from 18 countries have been honored by the Wolf Foundation.

The Wolf Foundation was established by the late Dr. Ricardo Wolf, inventor, diplomat, and philanthropist, 'to promote science and art for the benefit of mankind'. Born 1887 in Germany, Dr Wolf emigrated to Cuba, and in 1961 was appointed Cuban Ambassador to Israel where he lived until his death 20 years later.

## News from associated organizations of IUPAC

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### **International Council for Scientific and Technical Information (ICSTI). Highlights of the winter committee meetings 10–11 January 1998, ICSTI Headquarters, Paris**

Once again the Winter meetings were well attended with a total of 28 participants. The discussions, which covered a wide spectrum of topics, were enlightening and provided a truly international forum with representatives from seven countries: France, Japan, the Netherlands, Russia, South Africa, UK and USA.

The participants discussed the current and future technical programme and acknowledged the increasing

importance of policy over technical issues. This trend must be reflected in the activity programme to respond better to the expectations of ICSTI members. They heard a report from David Lide on recent developments in the USA on database protection, and a presentation by Christine Deschamps President of EFLA. They discussed ways of enlarging the membership. They agreed on the discussion topics for the next General Assembly and on the slate for election of the new Executive Board.

### *Technical programme*

#### *Current projects*

- The pilot project on access to telematics facilities in the Eastern Caribbean, which was jointly sponsored by six international organizations including UNESCO, the Pan American Health Organization (PAHO) and ICSTI, has entered its final phase. ICSTI will deliver the final project evaluation report to UNESCO by 31 January 1998, and Elliot Siegel, project coordinator, will give a final report to ICSTI at the 1998 General Assembly.
- The project to establish a unified alphabetical finding list of terms used in physics with references to all current classification schemes, and to mount the schemes and the list on the ICSTI Website is being pursued by John T. Scott. VINITI will provide technical support.
- The cooperative project with the ISSN International Centre, which aims to add information on A&I services to the ISSN Register, has been pursued with tests on ISSN matching between members' databases and the ISSN Register, and the results are very encouraging. All members concerned are invited to send their tapes to Slawek Rozenfeld, Head of the Computer Section (rozenfeld@issn.org). Suzanne Santiago indicated that she will leave the ISSN International Centre to take up the position of Director of ABES, the National Agency for the French Academic Bibliographic Network. She confirmed, nevertheless, the commitment of the ISSN Centre to cooperate with ICSTI.
- Concerning the Multilingual Thesaurus of Geosciences, it was indicated that it will not be mounted on the Web at this stage because IUGS/COGEOINFO expects to finance longer term maintenance of the MT from licences for its use in specific applications. A small sample will be mounted on the Web for promotion purposes and this could be linked to the ICSTI Website.
- The comparative study of access to journals through subscriptions and document delivery has been finalized and the report is available on the ICSTI

Website.

- The results of the survey of ICSTI members on their use of electronic networks presented at the last General Assembly are available on the private page of the ICSTI Website.

#### *New projects*

- In response to a need expressed by several members at the last General Assembly, a survey aimed at obtaining information on end-user needs and expectations of network-based products and services has been proposed. Wubbo Tempel and Henk Compier have set up the methodology and prepared a questionnaire which will be distributed to members for follow-up action.
- A proposal to develop a joint classification scheme for the Life Sciences has been further examined by Joan Thorne at BIOSIS UK. Because of the diversity of the existing schemes, it is unlikely that a common scheme can be created, but an alternative might be a look up file in which users could enter a concept of interest and be directed to where that concept might be found in member services. An exploratory meeting among interested members has been scheduled for February 1998 in Paris. If the proposal meets with their agreement and commitment, it will be put forward for consideration as a formal ICSTI project at the next General Assembly.

#### *Information policy issues*

John Anderson chaired the first meeting of the Information Policy Committee. All discussions and comments highlighted the growing importance of information policy issues and the need to set up a working procedure so as to monitor them and take action.

A working document which has been mounted on the private page of the ICSTI Website includes a glossary of terms, and a matrix of members' attributes aimed to provide quick reference to appropriate organizations on a given question. Members are invited to check their entry and ask for changes if necessary.

Two proposals were examined:

- one for a cooperation between ICSTI and CENDI, the US Federal STI managers interagency working group, to cover better STI management issues and linking to related sites. They suggest information sharing through a cooperative agreement whereby they would focus on US sites while ICSTI would focus on Europe and other areas. This proposal will be followed up by both Secretariats.
- the other for a discussion session during the next General Assembly, proposed by Sumio Horiuchi of JST, on the problems raised by restructuring in the information industry. This proposal was accepted.

#### *Discussion session*

##### *Recent developments in copyright legislation*

Attention was drawn to the report provided by Dan Wilde on behalf of the Committee on Legal Issues. This report has been mounted on the private page of the ICSTI Website.

David Lide gave a presentation on recent developments in the USA. He recalled that following deferral of the draft treaty on intellectual property in databases at the WIPO diplomatic conference held in December 1996, WIPO convened an information meeting in September 1997 to discuss possible further action. The consensus of the meeting was that the issue of *sui generis* database protection was not ready for WIPO actions and that further deliberations were needed.

New draft legislation was introduced in the House of Representatives in October 1997. The proposed bill\* entitled 'Collections of Information Antipiracy Act' (H.R. 2652) is raising less opposition within the library and scientific communities, as it drops the *sui generis* database protection in favour of other concepts. It should be noted that the Registrar of Copyrights has expressed a need for database protection in the 'Report on legal protection for databases' to be found on the Library of Congress Website at:

<http://lcweb.loc.gov/copyright/more.html#rpt>

The American Association for the Advancement of Science (AAAS) has issued a statement on intellectual property protection for databases which explains the AAAS position against *sui generis* intellectual property rights proposals. The text can be found at:

<http://www.aaas.org/spp/dspp/sfrr/aaasdb.htm>

On the European scene, David Russon indicated that the European Union has issued a draft directive on Copyright and Related Rights in the Information Society. The full text can be found at:

<http://www.europa.eu.int/comm/dg15/en/intprop/intprop/1100.html†>

##### *Presentation on IFLA*

Christine Deschamps, who is the new President of IFLA (International Federation of Library Associations and Institutions), presented the structure and activities of IFLA which aims at international cooperation in all fields of library activities. Details can be found at:

<http://www.nlc-bnc.ca/ifla/>

There are several areas where cooperation could be established between IFLA and ICSTI. In the area of electronic archives, IFLA has a project with FID and ICA, and is involved in a draft standard being developed by ISO/TC 46. IFLA is also involved in issues of pay-

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\*Copy available from Secretariat.

†The repetition of 'intprop' is not an error!



ment for electronic information through two of its committees: one on legal matters and the other on freedom of access to information and freedom of expression.

It was agreed that the two organizations would establish communication and exchange of information to find a common agenda of actions.

#### *Annual meetings*

##### *1998 General Assembly*

As announced on several occasions the 1998 General Assembly will be held on 21–25 May at Loch Lomond, near Glasgow. It is hosted by the British Library supported by BIOSIS UK. It will include three discussion sessions on the following topics:

- Development of electronic libraries, organized by David Russon;
- Restructuring in information industry, organized by Surnio Horiuchi;
- Recent developments in description of information items, organized by Eamon Fennessy.

The meeting package will be dispatched at the beginning of February.

##### *1999 General Assembly*

An invitation to host the 1999 General Assembly in Taipei, Taiwan, has been extended by the Science and Technology Information Center (STIC). The Executive Board made a recommendation to accept the invitation.

## **Federation of the European Chemical Societies**

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6th-FECS-Conference-on-Chemistry-and-the-Environment: Atmospheric Chemistry and Air pollution (VOC, oxidants/Nox and Particulates) 26–28 August 1998, Copenhagen Denmark.

### **Scope of the conference**

The purpose of the conference is to bring together scientists and others from different areas within atmospheric chemistry and air pollution research and control in order to discuss current knowledge and future developments.

The main topics will include:

- Volatile organic compounds (VOCs)
- Oxidants, including ozone and NO<sub>x</sub>
- Particulate matter

On each of these main topics there will be sessions on the following subtopics:

- Anthropogenic and biogenic sources of emissions

and exposures, pollution prevention, standards and regulations

- Measurements/monitoring of air quality and air emissions
- Atmospheric chemistry and fate of chemicals
- Effects of air pollutants on vegetation and human health

Modeling is considered an integral part of each topic.

#### *Plenary lectures*

Laboratory studies of hydrocarbon reactions of importance in regional air quality. *A. R. Ravishankara, NOAA, USA*

The future role of chemistry in air pollution modeling. *William R. Stockwell, Fraunhofer Institute, Garmisch-Partenkirchen, Germany*

Physical and chemical characterization of particulate matter emissions from air pollution sources. *Glenn Gass, Caltech, USA*

Studies of processes affecting airborne particulate matter: Source and ambient air. *Roy Harrison, University of Birmingham, U.K.*

Secondary environmental chemicals: sources, fate and impact of haloacetic acids. *Hartmut Frank, Univ. Bayreuth, Germany*

Atmospheric chemistry of selected automotive fuels and fuel additives. *T. J. Wallington, Ford Motor Co, Detroit, USA*

NMHC climatology in Northern Europe. *Anne Lindskog, WL, Gothenburg, Sweden*

Gas-particle partitioning and particle formation from secondary aerosols. *Richard Kamens, Univ. NC, Chapel Hill, USA*

Sampling and analysis of biogenic hydrocarbons in air—an overview. *Bo Larsen, JRC, Ispra, Italy*

Deposition of ozone to plant canopies—Mechanisms and effects. *Helge Ro-Poulsen, Copenhagen University, Denmark*

Laboratory studies of aldehyde and ketone reactivity. *Claus J. Nielsen, Oslo University, Norway*

Risk of cancer and exposure to gasoline vapors. *Elsebeth Lynge, Danish Cancer Society, Copenhagen, Denmark*

Monitoring airborne particulates—new CEN standards. *T. van der Meulen, RIVM, Bilthoven, the Netherlands*

## **70th Birthday of Wolfgang Fritsche**

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Dr Wolfgang Fritsche CChem HonFRSC, Honorary Life President of FECS, celebrated his 70th birthday on 11 March 1998. A press release issued by the Gesellschaft Deutscher Chemiker can be accessed on the internet at <http://www.gdch.de/pubrelat/wpd0698.htm>

**112th AOAC International Annual Meeting and Exposition, 13–17 September 1998, Montréal, Quebec, Canada**

*Scheduled program topics*

- Analytical Assessments to Assure Consistency and Biological Equivalence of Biotechnology Derived Products
- Application of LCIMS and CEIMS for Food Analysis
- Capillary Electrophoresis/HPLC
- ELISA Methodology and Food Testing
- Implementation of ICH Validation of Analytical Procedures for Pharmaceuticals
- Laboratory Management Issues
- Measurement of Moisture in Oils
- New Trends in Sample Preparation Techniques
- Quality Assurance in the Analytical Laboratory
- Regulatory Issues Related to Maple Sap, Maple Syrup, and Maple Sap/Syrup Products
- Parasitology in Water and Foodborne Pathogens (Cyclospora, Cryptosporidium, and Toxoplasmosis)

Numerous poster sessions will give participants the chance to talk with presenters one-on-one.

The always popular Regulatory Roundtable (with a focus on rapid methods of food analysis to supplement complex instrumental analysis in 1998) brings representatives from regulatory agencies worldwide to talk about upcoming programs and to meet in small groups to answer questions, learn about the concerns of the technical community and discuss issues in depth.

*Laboratory exposition*

The Expo will showcase the latest in laboratory equipment and services.

*Training courses*

These continuing education opportunities are scheduled before and after the meeting. Courses may include:

- Quality Assurance for Analytical Laboratories
- Quality Assurance for Microbiological Laboratories
- Implementing Good Laboratory Practices
- Basic Statistics for Analytical Science
- Statistics for Method Development
- Intralaboratory Analytical Method Validation
- ISO9000, ISO/IEC Guide 25, and the laboratory

For more information contact the AOAC International Meetings and Education Department by Phone: toll-free +1 800 379 2622 from North America only, +1 301 924 7077 world-wide; Fax: +1 301 924 7089; or Internet email: [meetings@aoac.org](mailto:meetings@aoac.org) or the AOAC web site: <http://www.aoac.org> for regularly updated information on the meeting.

**New books**

*Japanese Language Translation of Quality Assurance Principles for Analytical Laboratories*

AOAC International has announced the publication of a new book, the Japanese language translation of *Quality Assurance Principles for Analytical Laboratories* written by Frederick M. Garfield. The translation was prepared by a member of AOAC, Makoto Miyahara of the National Institute of Health Sciences, Japan.

This handbook provides guidelines and specific recommendations for initiating or improving a laboratory quality assurance (QA) program. It also provides justification for commitment of resources toward improved laboratory operations.

The book draws on published principles, practices, guidelines, and procedures used by many organizations—and includes illustrations of forms, reliable practices, procedures, and information used by several US federal agencies.

This edition contains a chapter on statistical applications and analytical control charting which calls attention to how these techniques can be used in a QA program, and an appendix that provides criteria which can be used by laboratories for self-evaluation of their QA programs.

The cost of the 188 page softcover book is \$155 in North America (USA, Canada, Mexico) and \$172 outside North America, with a 10% discount for members of AOAC International.

For more information, or to order the Japanese Language translation of *Quality Assurance Principles for Analytical Laboratories*, contact AOAC International by Tel.: +1 301 924 7077, fax: +1 301 924 7089, Internet: [pubsales@aoac.org](mailto:pubsales@aoac.org), or mail: 481 North Frederick Avenue, Suite 500, Gaithersburg, MD 20877-2417, USA.

*Dietary fiber analysis and applications*

AOAC International has announced the publication of a new book, *Dietary Fiber Analysis and Applications*, by Sungsoo Cho (Kellogg Company), Jonathan W. DeVries (General Mills, Inc.), and Leon Prosky (Retired, US Food and Drug Administration).

This manual provides up-to-date information on the chemical properties of dietary fiber and reliable analytical methodology with an emphasis on AOAC® *Official Methods*<sup>SM</sup>. Vital information is presented in a straightforward manner and complex concepts are made simple. Numerous charts, tables, and figures are also employed to provide further illustration of more difficult topics.

The information contained in this manual will help analytical chemists select and use the most appropriate methods and techniques in analyzing food samples. It will also help nutritionists, food scientists, and health

professionals interpret dietary fiber data derived from such analysis.

The cost of the 202 page softcover book is \$83 in North America (USA, Canada, Mexico) and \$100 outside North America, with a 10% discount for members of AOAC International.

*For more information, or to order Dietary Fiber Analysis and Applications, contact AOAC International by phone: +1 301 924 7077, fax: +1 301 924 7089, Internet: aoac@aoac.org, or mail: 481 North Frederick Avenue, Suite 500, Gaithersburg, MD 20877-2417 USA.*

## HUGO SCHIFF INTERNATIONAL 'Store House': Florence, Italy.

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The 'Hugo Schiff International Storehouse' is a project of the Laboratory of Educational Research of the Department of Chemistry at the University of Florence. The plan will become finalized with the restructuring of the 'GreatHall' of the Chemistry Department at the University of Florence. In essence, this will serve as an international centre for the 'History of Chemistry'.

The H. Schiff Store House, according to our projections, will become a multimedia opportunity, designed for the educational use of telematic communications in the World Wide Web, particularly aimed at communicating the History of Chemical Science and Technology. Thus, the Hugo Schiff Great Hall, rather than being abandoned following the transfer of the Chemical Institute to the Sixth Campus in the suburbs of Florence, will become a cultural and scientific centre. A place of international reference for the study and research of multiple historical-cultural relations that link the city of Florence to the history of Chemistry, even prior to the traditions of alchemy—and on a world level. The Store House, named after Hugo Schiff (1834-1915), the famous chemist who founded the Chemical Institutes of Florence, will thus become a place of historical-scientific research, with a strong educative aspect, including a 'Virtual Museum and International Multimedia Archive'. The use of telematic distance education will help realize innovative didactics and bibliographies, adapted to the cognitive and historical scientific aspects of chemistry.

LRE initiated the promotion of the Hugo Schiff Store House project, in order to begin documenting the works of H. Schiff. Research was begun in 1984, the year in which we initiated a historiographic investigation of the scientific activities of the Schiff brothers Hugo (chemist) and Maurice (naturalist), who both lived in Florence for years, in addition a Convention for the 150th anniversary of H. Schiff's birthday (25 October 1884) was organized, in collaboration with the University of Florence, the Italian Chemical Society, the town council and province of Florence, and the Tuscany Region. Following

the conference, we proposed the idea of founding a Hugo Schiff Storehouse.

Discussions are being held with the Chemical Heritage Foundation (see: <http://www.chemheritage.org/>), with the goal of developing a close collaboration between Europe and the USA on the Hugo Schiff Store House International project. CHF has shown interest in this idea. They have invited Dr Paolo Manzelli, the coordinator of the Laboratory of Educational Research at the University of Florence, to Philadelphia, PA, USA. The purpose of the visit will be to detail the criteria of an eventual collaboration on the project, that is foreseen to unfold at the convention of the History of Chemistry, to be held in the year 2000, the year of the Jubilee, for which we have already gained the approval of the Commission for Cultural Events of the Town Council of Florence.

*For further information contact: Prof. Dr Paolo Manzelli, Direttore del Laboratorio di Ricerca Educativa, Facolta' di Scienze Mat. Fis. e Nat., Universita' degli Studi di Firenze, Tel.: + 39-55-332549, Fax: + 39-55-354845, E-mail: Ire@chim1.unifi.it, <http://www.chim1.unifi.it/group/education>*

## New books from IUPAC

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### *Introduction to Chemical Nomenclature*

This book arose out of the convictions that IUPAC nomenclature needs to be made as accessible as possible to teachers and students alike, and that there is an absence of relatively complete accounts of the IUPAC 'colour' books suited to school and undergraduate audiences. This is not to decry in any way the efforts of organisations such as the Association for Science Education (ASE) in the UK, but what we wished to produce was a version of IUPAC rules that would be relatively complete and allow the beginner to explore and learn about nomenclature as much or as little as desired.

It is hoped that this volume will more than cover all the nomenclature requirements of students at pre-University and early undergraduate levels in most countries. It should also enable University students and teachers to learn the basic principles of nomenclature methods so that they can apply them accurately and with confidence. It will probably be too advanced for school students, but should be useful for their teachers.

### *Compendium on Analytical Nomenclature*

The first edition of the *Compendium on Analytical Nomenclature* was published in 1977, as a result of the pioneering work of the editors, H.M.N.H. Irving, H. Freiser and T.S. West. It was a collection of all those reports on analytical nomenclature which had been accepted by

the competent IUPAC bodies and published in Pure and Applied Chemistry between 1960 and 1976 (one in 1978), a total of 23 reports.

In the Preamble to the first edition the editors devoted a whole section to ideas and recommendations concerning the standardization of nomenclature. The contents of this section are still useful for all those who are committed to the standardization of symbols and terms to be used in analytical chemistry.

The second edition of the Compendium was published in 1987, in which the chapters were revised, supplemented or replaced by the reports on nomenclature (11) which had appeared between 1976 and 1984.

The manuscript was prepared by H. Freiser and G.H. Nancollas. The original format and structure of the first edition was kept, including the useful alphabetical index of terms.

In 1992, A. Hulanicki, President of the Division of Analytical Chemistry of IUPAC initiated a comprehensive revision of the Compendium, because of the great number of reports on nomenclature that appeared in the early 90s, due to the acceleration of the work within the commissions.

In the last decade the demand for new analytical procedures has increased steadily and at the same time the diversity of the techniques has expanded and the quality and performance characteristics of the procedures have come to be a focus of interest. New types of instrumental and automatic techniques have emerged and computerization has taken over. The scope of analytical chemistry has been widened as the question to be answered was not only the chemical composition of the sample, but also the structure, of substances, and changes in composition and structure in space and time.

In step with the revolutionary development of analytical chemistry the use of these analytical procedures—as tools yielding chemical information on material—has become indispensable in nearly all fields of human activities, including research, development, production and service.

The widespread application of analytical methods has called for scientific and universal regulation of the terms used, for the sake of uniformity, for understandability and for straightforward communication between experts in the most diverse fields.

For the above reasons the Analytical Division Committee of IUPAC has instituted and supported this revision of the Compendium. A Working Party for the revision was established from those who had the responsibility of preparing the drafts and the final text for publication. In addition, each Commission delegated a 'coordinator' whose responsibility was to mediate between the Working party and their Commission.

### *Nonlinear Spectroscopy for Molecular Structure Determination*

Since its advent in 1960, the laser has played many very important roles in molecular spectroscopy. At present it would be almost impossible to find a laboratory that investigates molecular structure and dynamics which is not equipped with any lasers. Even in the early period of the development of laser applications, scientists realized that the most remarkable characteristics of laser light are coherence, high power density and high spectral purity. These are the ideal characteristics for the observation of nonlinear phenomena. Nonlinear spectroscopy, made feasible by lasers, has proved to be an extremely powerful tool for molecular structure studies. It allows us to examine new aspects of molecular processes in detail and to determine molecular parameters orders of magnitude more precisely and rapidly than with conventional light sources.

A large variety of nonlinear spectroscopic methods have so far been developed and applied to studies of molecular structure and dynamics. Some of these methods utilize complex techniques, making it difficult to understand the underlying principles. Furthermore, most of these methods are referred to by nicknames or acronyms, which keeps them shrouded in mystery for most non-specialists who are thereby discouraged from mastering and applying the methods to molecular systems.

Under these circumstances it was judged appropriate and timely to overview those nonlinear spectroscopic methods which are currently particularly useful for studies of molecular structure and dynamics. Thus, the Commission on Molecular Structure and Spectroscopy of the International Union of Pure and Applied Chemistry decided to publish a book, intended to provide an introduction to nonlinear spectroscopy for non-specialists.

The first chapter of the book is devoted to introduction of the basic principle of coherent interaction of the laser light field with molecules including higher-order nonlinear effects. This chapter is intended to minimize difficulties which readers might face in understanding the following chapters. Chapters 2 through 10 present nine kinds of laser spectroscopic methods which elucidate the structure and dynamics of excited molecules, chemically reactive species, molecules in liquids or on surfaces, and so on. Each chapter describes first the underlying principle of the method and its typical experimental setup in order to allow a clear understanding by readers who are not familiar with laser spectroscopy. In the remaining part of each chapter, several typical examples of the application are given together with the current status of the method.

*Nonlinear Spectroscopy for Molecular Structure Determination. Authors: R.W. Field, E. Hirota, J.P. Maier, S.*

*Tsuchiya (Coordinator). Published by Blackwell Science Ltd. 120 line illustrations. 288 pp. ISSN 0632042176. Price £55.00. February 1998.*

*Organic Light-Emitting Materials and Devices, Macromolecular Symposia V125, 1997*

The international symposium on 'Organic Materials and Devices in Display Technologies' was held as part of the 213th ACS National Meeting in San Francisco on 13–15 April 1997. Organic light-emitting diodes (LED) and liquid crystal displays (LCD) were the focus of the symposium. 'Display technology is the final frontier in the information superhighway' was used as the symposium logo. There were 6 oral sessions (46 papers) followed by a poster session (24 papers). 37 papers were from North America (36 from USA, 1 from Canada), 20 from Europe and 13 from Asia. The oral sessions included: (1) tutorial on organic electroluminescence technology; (2) synthesis of organic light emitting materials; (3) new light emitting device concepts; (4) polymeric LED systems; (5) organic materials for LCD applications; (6) stability of organic LEDs. The symposium was very popular, with excellent attendance of 120 to 250 people, indicating a very strong interest in the area.

There were two unique features that distinguished this symposium from most other ACS symposia. First, the participants of the symposium included a mix of chemists, physicists, and engineers, reflecting the highly interdisciplinary nature of organic display technology. Second, about half of the participants were from industry. This is highly unusual for ACS meetings and is in accord with the fact that the number of labs that are involved in this field has increased over the past years.

This volume contains selected symposium papers on the subject of organic electroluminescent (EL) materials and devices. Although this is a relatively new area, there has been tremendous progress made. This is clearly reflected in the papers in this volume. It is now commonly agreed that commercialization of organic LEDs is imminent.

**B. R. Hsieh,  
Webster, New York, June, 1997**

*Surface Modification of Polymers, Macromolecular Symposia V126, 1998*

The Institute of Polymer Research Dresden and the Institute of Macromolecular and Textile Chemistry of the Dresden University of Technology have organized Dresden Polymer Discussions on different topics of polymer science since 1986.

The sixth in this series of discussion meetings held within a limited circle of invited researchers, was held in Meissen near Dresden from April 14 to 17, 1997. It was dedicated to the field 'Surface Modification' and included topics such as:

- Adsorption of functional polymers
- Polyelectrolytes, polyelectrolyte complexes, surfactants
- Ordered thin layers
- Surface characterization
- Polymers in solutions and at interfaces
- Grafting

The meeting assembled more than 40 scientists from 12 countries with researchers from the Dresden institutes. They discussed 30 oral and 25 poster presentations.

Particular attention was paid to the relevance of surface phenomena and surface modification for practical applications. The participation of a number of representatives from industry stimulated discussions in this respect.

Interface phenomena and optimized design of interfaces have been gaining increasing importance in technological processes; however their scientific fundamentals have not yet been established. The gap between advanced theoretical works on the understanding of real systems and processes needs to be pursued in joint efforts.

**Hans-Jorg Jacobasch,  
Symposium Editor, Dresden, July 1997**

*Petro Polymers vs. Green Polymers, Macromolecular Symposia V127, 1998*

The Rolduc Polymer Meeting was organized in 1997 for the 10th time. Over the years this discussion meeting, known for its intensive debates on up to date themes, has acquired both an intimate and an international character. The success of the Rolduc Polymer Meetings is also based on extensive and active participation by industrial researchers and research managers. Due to their contributions, we were able to achieve the integration of Polymer Science and Polymer Technology that was aimed at.

Discussion in society about sustainability, about reproducible natural resources, on fossil resources may well influence the long-term future of polymer materials. The International Organizing Committee of the Rolduc Polymer Meeting therefore decided to organize a thorough discussion on the topic 'Petro(chemical) based Polymers' versus 'Green Polymers'.

For thousands of years nature was the only source of polymeric materials and even at this moment quite a list of natural polymer products is still present on the market (c. g. wool, silk, cotton, cellulose, natural rubber, varnish etc.). We all know the extensive list of synthetic polymers, for the greater part based on fossil hydrocarbons. The latest developments and the 'green character' of both these types of polymer were discussed in two separate sessions.

Some polymers are produced both by industry and by

nature (polyaminoacids, polyesters, casein) and the production of synthetic polymers from 'green monomers' (CO<sub>2</sub>, CH<sub>4</sub>, ethylene etc.) was shown to be well within reach. Finally, combinations of products from both areas may lead to attractive new materials (composites and blends of synthetic and biopolymers, chemically modified green polymers, copolymers and so on). The synergy of 'Petrobased' and 'Green' polymers combinations was intensively discussed.

This volume covers most oral contributions presented at the meeting and some selected poster presentations.

Ludo Kleintjens, Chairman

## Received at the Secretariat

### *Nomenclatura de Química Inorgánica, Recomencions de 1990*

A Catalan translation of the Nomenclature of Inorganic Chemistry by Enric Casassas i Simó and Joaquim Sales i Cabré. Available from the Institut d'Estudis Catalans, Carrer del Carme 47, ES-08001 Barcelona, Spain.

# Conference Calendar

1998

### **Trace element speciation in biomedical, nutritional and environmental sciences**

4–7 May 1998

1st International Conference on Trace Element Speciation in Biomedical, Nutritional and Environmental Sciences, Neuherberg, Munich, Germany.

Prof. Dr Peter Schramel, GSF-Forschungszentrum für, Umwelt und Gesundheit GmbH, Institut für Ökologische Chemie, Neuherberg, D-85758 Oberschleissheim, Germany. Tel.: +08931874062.

Secretariat: Ulla Schrödel, GSF-Forschungszentrum, Postfach 1129, D-85758 Oberschleissheim, Germany. Tel.: +49 89 3187 3030, fax: +49 89 3187 3362.

### **Automation and new technology for the clinical laboratory**

24–27 May 1998

International Congress on Automation and New Technology for the Clinical Laboratory, Santiago de Compostela, Spain.

Dr Ramon Galimany, Sociedad Espanola de Bioquímica Clínica y Patológica Molecular, Padilla

323-325 Desp 68, ES 08025 Barcelona, Spain. Tel.: +34 3 446 26 70, fax: +34 3 446 26 72.

### **Degradation processes in the environment**

24–28 May 1998

Measuring, Modelling, and Predicting Degradation Processes in the Environment, Dubronik (Cavtat), Croatia.

Dr Aleksandar Sabijic, Institute Rudjer Boskovic, PO Box 1016, HR-10001 Zagreb, Croatia. Tel.: +385 1 456 1089, fax: +385 1 272 648, e-mail: sabljic@olimp.irb.hr

### **Organic synthesis**

28 June–2 July 1998

12th International Conference on Organic Synthesis (12-ICOS), Venice, Italy.

Prof. Carlo Scolastico, Dip.to di Chimica Organica e Industriale, Università di Milano, Via G. Venezian 21, I-20133 Milano, Italy. Tel.: +39 2 236 7613, fax: +39 2 236 4369, e-mail: nicotra@imiucca.csi.unimi.it

### **Heteroatom chemistry**

5–11 July 1998

Fifth International Conference on Heteroatom Chemistry, London, Ontario, Canada.

Prof. Kim M. Baines, Department of Chemistry, University of Western Ontario, London, Ontario, Canada, London, Ontario N6A 5B7, Canada. Tel.: (519) 661-2166, fax: (519) 661-3022, e-mail: kbaines2@julian.uwo.ca

### **Chemistry in Africa**

6–10 July 1998

7th International Conference on Chemistry in Africa, South Africa.

Prof. T. M. Letcher, Department of Chemistry & Applied Chemistry, University of Natal, Durban 4041, South Africa. Tel.: +27 (31) 260 1395, fax: +27 (31) 260 3091, e-mail: Ticca@scifs1.und.ac.za

### **Macromolecules**

13–17 July 1998

37th International Conference on Macromolecules (MACRO '98), Gold Coast, Australia.

Prof. R. Gilbert, Chemistry School, Sydney University, NSW 2006, Australia. Tel.: +612 9351 3366, fax: +612 9351 3329

## Photochemistry

19–24 July 1998

XVII IUPAC Symposium on Photochemistry, Sitges, Spain.

Prof. Josep Font i Cierco, Departament de Química, Universitat Autònoma de Barcelona, Bellaterra, 08193 Barcelona, Spain. Tel.: +34 3 581 1255, fax: +34 3 581 1265, e-mail: iqorfont@cc.uab.es

## Polymeric materials

20–23 July 1998

Mechanical Behaviour of Polymeric Materials, 18th Discussion Conference.

Dr Jaroslav Kahovec, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyrovského nám. 2, 162 06 Prague 6 - Petriny, Czech Republic. Tel.: +4202360341, fax: +4202367981, e-mail: sympo@imc.cas.cz

## Chemical thermodynamics

26 July–1 August 1998

15th International Conference on Chemical Thermodynamics, Porto, Portugal.

### How to apply for IUPAC sponsorship

To apply for IUPAC sponsorship, conference organizers should write to the IUPAC Secretariat (see inside back cover for address) requesting an Advanced Information Questionnaire (AIQ). Completed AIQs should be returned to the Secretariat preferably 2 YEARS and at least 12 months before the conference. Late applications will not be considered. Further information on granting of IUPAC sponsorship was published in *Chem. Intl.* 1992, **14**, 203.

Prof. Manuel A.V. Riberio da Silva, Department of Chemistry, Faculty of Science, Rua do Campo Alegre, 687, P-4150 Porto. Tel.: +35 12 6082821, fax: +35 12 2008628, e-mail: risilva@fc.up.pt

## Novel aromatic compounds

2–7 August 1998

9th International Symposium on Novel Aromatic Compounds (ISNA-9), Hong Kong.

Prof. Henry N.C. Wong, Department of Chemistry, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong. Tel.: +852 2609 6344, fax: +852 2603 5057, e-mail: hncwong@cuhk.edu.hk

## Pesticide chemistry

2–7 August 1998

9th International Congress on Pesticide Chemistry, London

Dr John F. Gibson, Scientific Secretary, The Royal Society of Chemistry, Burlington House, London W1V 0BN.

## Solubility phenomena

5–8 August 1998

Eighth International Symposium on Solubility Phenomena, Niigata, Japan.

Kiyoshi Sawada, General Secretary of the 8th ISSP, Department of Chemistry, Faculty of Science, Niigata University, Niigata 950-21, Japan. Tel.: +81 25 262 6265, fax: +81 25 262 6116, e-mail: issp@sc.niigata-u.ac.jp

## Chemical education

9–14 August 1998

15th International Conference on Chemical Education: Chemistry and Global Environmental Change, Egypt.

Prof. Saad S.M. Hassan, Department of Chemistry, Faculty of Science, Ain Shams University, Cairo, Egypt. Fax: +20 2 831836, e-mail: iupac15@asunet.shams.eun.eg

## Carbohydrate symposium

9–14 August 1998

19th International Carbohydrate Symposium, San Diego, CA, USA.

Prof. David A. Brant, ICS 98 Symposium Secretariat, Department of Chemistry, University of California, Irvine, CA 92697-2025, USA. Tel.: (714) 824-8976, fax: (714) 824-1372, e-mail: ics98@uci.edu, Web Page: <http://www.ics98.uci.edu>

## Physical organic chemistry

16–21 August 1998

14th International Conference Physical Organic Chemistry, Florianopolis, Brazil.

Prof. Eduardo Humeres, Department of Chemistry, Universidade Federal de Santa Catarina, Campus Univeritario-Trindade, 88040-900 Florianopolis, Brazil. Tel.: +55 48 231 9219, fax: +55 48 231 9711/231 9688, e-mail: humeres@mbox1.ufsc.br

## Co-ordination chemistry

31 August–4 September 1998

33rd International Conference on Co-ordination Chemistry, Florence, Italy.

Dr Ivano Bertini, Chairman, University of Florence, 33rd ICCS Secretariat, Department of Chemistry, Florence 50121, Italy. Tel.: +39 55 2757 549, fax: +39 55 2757 555, e-mail: ICCS@rics.lrm.fi.cnr.it

## Electrochemistry

13–18 September 1998

International Society of Electrochemistry, Kitakyushu, Japan.

Prof. Erika Kalman, 1025 Budapest, Central Research Institute for Chemistry of the Hungarian Academy of Sciences, Puzstaszeri út 59-67, Hungary. Tel.: +36 1 325 7548, fax: +36 1 325 7509, e-mail: kale@cric.chemres.hu

## Chemistry of germanium, tin and lead

20–25 September 1998

9th International Conference on the Coordination and Organometallic Chemistry of Germanium, Tin & Lead (ICCOC GTL-9) Melbourne, Australia.

*Prof. Dainis Dakternieks, Deakin University, Biological & Chemical Sciences, Geelong 3217, Australia.*

## Supramolecular science and technology

27 September–3 October 1998

1st International Conference on Supramolecular Science & Technology, Zakopane, Poland.

*Marek Pietraszkiewicz, Chairman of the ICSS&T, Polish Academy of Sciences, Kasprzaka 44/52, 01224 Warsaw. e-mail: pictrasz@ichf.edu.pl*

## Chemistry of natural products

11–16 October 1998

21st IUPAC symposium on the Chemistry of Natural Products, Beijing, China.

*Prof. Xiao-Tian Liang Institute of Materia Medica Chinese Academy of Medical Sciences 1 Xian Nong Tan Street Beijing 100050 China. Tel.: +86 10 6 301 3366-245, fax: +86 10 6 301 7757.*

## Excitonic processes in condensed matter

2–5 November 1998

Third International Conference on Excitonic Processes in Condensed Matter, Boston, MA, USA/

*Prof. William M. Yen, Department of Physics and Astronomy, University of Georgia, Athens, GA, USA. 30602-2451. Tel.: (706) 542-2491, fax: (706) 542-2492, e-mail: wyen@hal.physast.uga.edu*

1999

## Functional dyes

31 May–4 June 1999

4th International Symposium on Functional Dyes (IFD4), Osaka, Japan.

*Prof. Yasuhiko Shirota, Osaka University, Faculty of Engineering, Yamadaoka, Suita, Osaka 565, Japan. Tel.: 81 6 879 7364, fax 81 6 877 7367, e-mail: shirota@ap.chem.eng.osaka-u.ac.jp*

## CHEMRAWN

20–25 June 1999

CHEMRAWN XII—African Food Security and Natural Resource Management: The New Scientific Frontiers, Nairobi, Kenya.

*Dr Pedro Sanchez, Director General, International Center for Research in Agroforestry, PO Box 30677, Nairobi, Kenya. Tel.: [254] 2 521003, fax [254] 2 520023 e-mail: p.sanchez@cgnet.com*

## 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.

## Polymerization methods

12–15 July 1999

Advances in Polymerization Methods, 39th Microsymposium, Prague, Czech Republic.

*Dr Jaromir Lukas, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyovskeho na. 2, 162 06 Praha 6-Petriny, Czech Republic. Tel.: +42 2 360341, fax: +42 2 367981, e-mail: sympo@imc.cas.cz*

## Carotenoids

18–23 July 1999

12th International Symposium on Carotenoids, Cairns, Australia.

*Prof. George Britton, School of Biological Sciences, The University of Liverpool, Crown Street, Liverpool, L69 3BX, UK. Tel.: +44 (151) 794, fax: +44 (151) 794 4349.*

## Rheology of polymer systems

19–22 July 1999

19th Discussion Conference on the Rheology of Polymer Systems, Prague, Czech Republic.

*Dr Jaromir Lukas, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyovskeho na. 2, 162 06 Praha 6-Petriny, Czech Republic. Tel.: +42 2 360341, fax: +42 2 367981, e-mail: sympo@imc.cas.cz*

## Ionic polymerization

19–23 July 1999

International Symposium on Ionic Polymerization, Kyoto, Japan.

*Dr Shiro Kobayashi, Department of Materials Chemistry, Graduate School of Engineering, Sendai 606-01, Japan. Tel.: +81 75 753 5608, fax: +81 75 753 4911, e-mail: kobayashi@mat.polym.kyoto-u.ac.jp*



## Analytical science

25–30 July 1999

Analytical Science into the Next Millennium, SAC 99, Dublin, Ireland.

*Prof. Malcolm R. Smyth, School of Chemical Sciences, Dublin City University, Dublin 9, Ireland. Tel.: +353 1 7045308, fax: +353 1 7045032, e-mail: smyth@ccmail.dcu.ie*

## Solution chemistry

26–31 July 1999

XXVI International Conference on Solution Chemistry, Fukuoka City, Kyushu, Japan.

*Prof. Hitoshi Ohtaki, Department of Chemistry, Faculty of Science and Engineering, Ritsumeikan University, 1-1-1 Noji-Higashi, Kusatsu 525, Japan. Tel.: +81 775 61 2777, fax: +81 775 61 2659, e-mail: ohtaki@bkc.ritsumei.ac.jp*

## Macromolecule–metal complexes

6–10 September 1999

8th International Symposium on Macromolecule–Metal Complexes (MMIC–VIII) Tokyo, Japan.

*Prof. Eishun Tsuchida, Waseda University, Tokyo 169, Japan. Tel.: 81 3 5286 3120, fax: 81 3 3209 5522.*

## 2000

### High temperature materials chemistry

4–10 April 2000

International Conference on High Temperature Materials Chemistry, Aachen, Germany.

*Prof. K. Hilpert, Forschungszentrum Julich GmbH, Institut für Werkstoffe der Energietechnik (IWE 1), D-52425 Julich, Germany. Tel.: +49 2461 61 3280, fax: +49 2461 61 3699, e-mail: k.hilpert@fz-juelich.de*

### Bio-organic chemistry

First quarter 2000

5th IUPAC Symposium on Bio-Organic Chemistry, (ISBOC-V), New Delhi, India.

*Prof. S. Ranganathan, Biomolecular Research Unit, Regional Research Laboratory, Trivandrum 695 019, India. Tel.: +91 (471) 491 459, fax: +91 (471) 490 186.*

## Macromolecules

9–14 July 2000

International Symposium on Macromolecules (MACRO 2000), Warsaw, Poland.

*Dr Stanislaw Penczek, 90-363 Lodz, Sienkiewicza 112, Poland. Tel.: +48-42 819815, fax: +48-42 847126.*

## Natural products

1 September 2000

22nd International Symposium on Chemistry of Natural Products, Sao Paulo, Brazil.

*Prof. Dr Otto R. Gottlieb Rua 5 de julho 323, Apt. 1001, 22051-030, Rio de Janeiro 22051-030, Brazil.*

## Biotechnology

3–8 September 2000

11th International Biotechnology Symposium, Berlin, Germany.

*Prof. G. Kreysa, DECHEMA eV, Postfach 150104, Theodor-Heuss Allee 25, D-60061 Frankfurt/Main, Germany. Tel.: +49 (69) 7564 205, fax: +49 (69) 7564 302.*