

The News Magazine of the  
International Union of Pure and  
Applied Chemistry (IUPAC)

# CHEMISTRY

## International

March-April 2003  
Volume 25 No. 2



### Can Chemistry Help Avert Famine in Sub-Saharan Africa?

*A Preview of CHEMRAWN XII*



Canadian Participation  
in IUPAC

New Directions for  
CHEMRAWN



# From the Editor

## **CHEMISTRY** *International*

The News Magazine of the  
International Union of Pure and  
Applied Chemistry (IUPAC)

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**M**any aspects of Chemistry at the Interfaces will be addressed at the IUPAC Congress in Ottawa this coming August. There is yet another interesting interface that will unveil itself, one not explicitly spelled out in the program, which relates to the views of the field by different age groups and generations.

**The Young**—professionals below the age of 40—have clearly gotten the attention of the Congress organizers, who secured funds to subsidize the travel of more than 60 young scientists from academia, government,



*Photograph by O Neil Arnold*

or industry. They will be coming from all over (about 44 countries so far) to present their latest research. It should be no surprise that the theme of "Chemistry at the Interfaces" is attracting many young researchers. The "interfaces" are in a way what make chemistry a central science in a wide range of fields, and what make interdisciplinary research

the major tool today for exploring the frontiers of scientific knowledge and developing products and materials that better our lives.\*

**The Younger** chemists, while fewer, will also get a spotlight, as the nine winners (four in 2002 and five in 2003) of the IUPAC Prize for young chemists will be awarded at the opening ceremony of the Congress. The prize was established in 2000 to encourage outstanding young research scientists at the beginning of their careers, and is given for the most outstanding Ph.D thesis in the general area of the chemical sciences. Look for them in Ottawa; they will also present their work as posters.

**The Youngest**—students between the ages of 10 and 16—will have a chance to present their thoughts and ideas on all aspects of pure and applied chemistry. In collaboration with Science Across the World, a competition is now open for these young students to feature in a poster their view of the importance of chemistry in their daily life. All winning posters will be exhibited at the Congress in Ottawa in a display that will coincide with the launch of IUPAC's Public Understanding of Chemistry initiative (read more on page 13).

The Congress in Ottawa promises to be an interesting event where ideas will be exchanged on many levels. Whatever your specific interest, be prepared to engage the young, younger, and youngest scientists; they will benefit tremendously, and everyone just might learn something new!

Fabienne Meyers

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\*inspired by the comment of Paul R. Jones, University of North Texas, published in *C&EN*, 23 Sep 2002, p. 112, and titled "You Are the Catalysts for Chemistry."

# Contents

CHEMISTRY International March-April 2003 Volume 25 No. 2



<b>Secretary General's Column</b>	2
<b>Features</b>	
<b>Canadian Participation in IUPAC</b> <i>by Bryan R. Henry</i>	4
Countdown to Ottawa	5
<b>New Directions for CHEMRAWN</b> <i>by Parry Norling</i>	6
<b>CHEMRAWN XII</b> <i>by Ikenna Onyido</i>	
Chemistry, Sustainable Agriculture, and Human Well-Being in Sub-Saharan Africa	8
<b>Clinical Chemistry &amp; Laboratory Medicine</b> <i>by Renze Bais</i>	10
<b>IUPAC Wire</b>	
It's a Chemical World—A Poster Competition	13
John Prausnitz Awarded the 2002 Rossini Lecture	13
Freedom of Access to Primary Experimental Data	14
Maintaining the Permanent Availability of the Digital Records of Science	15
<b>The Project Place</b>	
Structure and Properties of Polyester Elastomers Composed of Poly(butylene terephthalate) and Poly( $\epsilon$ -caprolactone)	16
Recent Advances in Electroanalytical Techniques: Characterization, Classification, and Terminology	16
Metrological Traceability of Measurement Results in Chemistry	17
Environmental Implications of Endocrine Active Substances	18
The Revision of the IUPAC Compendium of Chemical Terminology	19
Provisional Recommendations	19
<b>Making an imPACT</b>	
Nomenclature of Regular Single-Strand Organic Polymers	20
Natural and Synthetic Substances Related to Human Health	21
Isotope-Abundance Variations of Selected Elements	22
<b>Bookworm</b>	
Polymer Membranes	23
Green Chemistry Education	23
Trace Elements in Food	24
Chemistry of Crop Protection	24
Women in Physics	25
The Skeptical Environmentalist—Measuring the Real State of the World	26
<b>Internet Connection</b>	
www.ifcc.org	27
<b>Conference Call</b>	
Coordination Chemistry <i>by Franc Meyer</i>	28
Chemical Thermodynamics <i>by Gerhard M. Schneider</i>	29
<b>Where 2B &amp; Y</b>	30
<b>Mark Your Calendar</b>	34

## *Naming Element 110*

# Secretary General's Column

I would like to use these pages of *Chemistry International (CI)* to comment on three matters that may be of interest to our readers: conferences, affiliates, and leadership. Recent developments and potential actions in these areas will have important ramifications for future IUPAC programs.

## Conferences

Among many chemists, IUPAC is probably best known for the many conferences it sponsors, some planned and coordinated by our divisions and operational committees, but many initiated independently by groups throughout the world. Sponsorship by IUPAC attests to the quality of the scientific program and indicates the host country's assurance that scientists from all countries may participate. A calendar and map distributed with the January issue of *CI* lists the conferences sponsored in 2003. Papers from many of these conferences are published in *Pure and Applied Chemistry (PAC)*; in fact, about half of *PAC* consists of these papers.

IUPAC sponsorship does not mean that we automatically provide financial support, but we have had some programs to support conferences, including the series on "New Directions in Chemistry" and "Conferences in Developing and Economically Disadvantaged Countries."

An ad hoc Conference Policy Development Committee has recently taken a comprehensive look at all our conference policies. As a result of the committee's findings, the Bureau has approved some changes in operations. Major changes are as follows:

- The **New Directions** program will provide funds on a competitive basis to support one or more conferences each biennium in innovative fields (such as those already held on advanced materials), as proposed by divisions and standing committees.
- The **Developing Countries** program will provide funds to support conferences in developing and economically disadvantaged countries that are either full or associate members of IUPAC. Divisions and committees will propose support for

conferences based on their assessments that the conferences are innovative in subject matter or location, fit into IUPAC programs, and would benefit from modest financial support.

- A new program will provide support for **IUPAC Lecturers** to give talks at conferences otherwise not supported by IUPAC in *developing and economically disadvantaged* countries. Divisions and committees will identify eminent scientists who are willing to participate in conferences and perhaps also present talks at universities in the host country.
- Funds are available for these programs for 2003 and, if approved by Council, USD 65 000 will be budgeted for these programs for 2004–2005.
- Policies and procedures for approving sponsorship of conferences will be revised to simplify the process while ensuring adequate review of applications.
- The responsibilities of the official IUPAC representative to each sponsored conference will be modified to provide better integration with other IUPAC programs.
- Policies for publication of lectures from sponsored conferences will be modified to provide more flexibility in the number of papers accepted from

each conference and to ensure adequate refereeing of the papers. Under this system, *PAC* will now have a scientific editor who will work with individual conference editors to produce proceedings from conferences. I am pleased to report that Professor James Bull of the University of Cape Town, South Africa, has been appointed editor of *PAC*. He has served as special topics editor of *PAC* since 1998, a duty that will now be subsumed within his broader responsibilities. You will soon hear more from Professor Bull about his plans for *PAC*.

## Affiliate Member Program

IUPAC's "Members" are National Adhering Organizations (NAOs), but in 1983 the IUPAC Council initiated an **Affiliate Member Program** (AMP) to foster close relations with individual chemists throughout the world. For a number of years we have had about



Edwin D. Becker  
IUPAC Secretary General  
1996-2003



5000 Affiliate Members—a substantial number, but small compared with the million or so chemists in the world. As we approach the 20th anniversary of the AMP, the Secretariat and I will be working with our NAOs and national chemical societies to increase the number of Affiliate Members and to strengthen the program.

Most Affiliate Members join and pay dues through their chemical societies, but IUPAC provides free membership for over 500 chemists in developing countries. As we increase the number of paid Affiliate Members, we will be able to provide additional sponsored memberships and thus bring *CI* and other benefits to chemists for whom such communication often provides a scientific lifeline.

We are always happy to receive input and ideas from Affiliate Members and to discuss issues raised by affiliates in the pages of *CI*. In addition, I hope that all affiliates will subscribe to the free IUPAC e-News, an informal e-mail newsletter distributed bimonthly. To subscribe or update your e-mail address, go to <[www.iupac.org](http://www.iupac.org)> and click on "Reader's Corner" and choose e-news from the menu.

## Leadership of Divisions and Committees

The heart of IUPAC's programs lies in our eight scientific divisions and three operational committees. The officers and members of the division and operational committees are responsible for developing new initiatives, approving and managing a wide variety of projects, and overseeing conferences and a broad range of other activities. We depend on having committee members who are well-qualified scientists, who are able and willing to devote time and effort to IUPAC, and who collectively represent the geographically diverse countries that comprise IUPAC.

We are now in the midst of a process to select these committee members and their officers for the next biennium. As the first step, I have this year for the first time made a formal request to all NAOs for suggested candidates for membership on various committees. A number of NAOs have provided many good suggestions to create an initial pool of names that will be augmented by our nominating committees and input from many individuals. As always, we welcome all suggestions about people, ideas, and projects that might help IUPAC contribute to the advancement of worldwide chemistry. 🏆

Edwin D. Becker <[tbecker@nih.gov](mailto:tbecker@nih.gov)> has been secretary general since 1996 and has been a member of various IUPAC bodies for 30 years. He is presently a scientist emeritus at the National Institutes of Health, Bethesda, Maryland, USA.



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# Canadian Participation in IUPAC

**T**he National Research Council Canada is currently organizing and preparing for the 39th IUPAC Congress and 86th Conference of the Canadian Society for Chemistry (CSC), to be held in Ottawa, Ontario, from 10–15 August 2003. *L'Actualité chimique canadienne—Canadian Chemical News (ACCN)* asked Professor B. R. Henry, currently chair of the Canadian National Committee (CNC) for IUPAC and scientific program chair for the 2003 IUPAC/CSC Congress, to summarize for their (mostly Canadian) readers the activities of the CNC within IUPAC. For the *CI* reader or the IUPAC community at large, the following excerpt from that article offers an inside look at Canadian participation, but also a description of our forthcoming and welcoming host in Ottawa.



*by Bryan R. Henry*

In Canada, our National Adhering Organization (NAO) is the National Research Council (NRC). Canadian participation in IUPAC is facilitated by the Canadian National Committee for IUPAC (CNC-IUPAC). This committee, which is drawn from NRC, academia, and industry, acts as an interface between IUPAC and

the Canadian chemical community. It is also responsible for nominating Canadians to serve on the various IUPAC committees, and represents Canada every two years at the IUPAC General Assembly. CNC-IUPAC also administers an awards program that is funded in part by Canadian Company Associates. This program helps young Canadian chemists and chemical engineers present papers at IUPAC-sponsored conferences outside of continental North America. They also participate in other activities such as a current project which aims at collecting used chemistry books and providing them to developing countries.

Canada has always enjoyed a high profile within IUPAC. Bill Schneider, past president of NRC, served as IUPAC president some years ago. Currently, Nelson Wright is the chair of Committee on Chemistry and Industry, Tom Tidwell is the president of the Organic and Biomolecular Chemistry Division, John W. Lorimer is the chair of the Project Committee, and Peter Mahaffy is the chair of the Subcommittee on the Public Understanding of Chemistry. These individuals and a number of others including Douglas Stephan,

Murray Moo-Young, and Gerald Stephenson serve on the various divisional committees.

One of the most tangible reasons to celebrate Canadian participation in IUPAC is the upcoming IUPAC/CSC Congress in Ottawa. Planning for this Congress began in 1995 with discussions between CSC, IUPAC, and NRC. These three parties ultimately reached an agreement setting out the conditions for a joint CSC-IUPAC conference. The bid was presented by CNC-IUPAC at the 1999 IUPAC meeting in Berlin and accepted by the Council.

CSC has agreed to change the dates of its annual conference to permit a single major chemical conference in August 2003. The Congress will be somewhat larger than our regular meeting and broader in scope. Special symposia are planned to celebrate the 50th anniversary of the solution of DNA and the opening of the Canadian Light Source in 2004. There will be a special symposium on the Public Understanding of Chemistry and another on Green Chemistry. In addition there is an especially strong set of divisional and interdivisional symposia devoted to forefront science. In all, 51 symposia are scheduled in 144 sessions. Each day will begin with an invited plenary lecture delivered by Professors Polanyi, Fréchet, and Smalley, respectively, and by the winners of the Chemical Institute of Canada Medal and the Montréal Medal.

We expect 2500 participants with about 800 oral presentations and 1200 posters. The preliminary program has been published and details are available at the conference Web site <[www.iupac2003.org](http://www.iupac2003.org)>. Scientific sessions will be held at the Westin Hotel and the Ottawa Congress Centre. Thanks to support from a number of organizations including IUPAC, we will be able to assist the attendance of younger scientists both from developed and economically disadvantaged countries. The Canadian chemical industry and a number of other donors have provided generous sponsorship exceeding \$CAN 150 000.

2003 Ottawa promises to be an outstanding conference at which we can showcase Canadian chemistry on an international stage. 🇨🇦

Reproduced from *ACCN*, February 2003 issue.

**Bryan Henry** <[chmhenry@uoguelph.ca](mailto:chmhenry@uoguelph.ca)> is fellow of the Chemical Institute of Canada and a professor in the Department of Chemistry and Biochemistry at the University of Guelph, Ontario. His research field is laser spectroscopy and theoretical chemistry. He is a past president of the CSC, a past chair of the CIC, and the 2001 winner of the Montreal Medal. He is currently chair of CNC-IUPAC and scientific program chair for the 2003 IUPAC/CSC Congress.

# Countdown to Ottawa



The 39th IUPAC Congress and the 42nd IUPAC General Assembly will be held concurrently in Ottawa, Canada, in August 2003. The Congress, jointly organized with the 86th Conference of the Canadian Society for Chemistry, will be held from 10–15 August. "Chemistry at the Interfaces," the theme of the event, will focus on areas such as chemistry and health, chemistry and society, chemistry and biology, and chemistry and materials. For a complete preview of the program, visit the congress Web site at <[www.iupac2003.org](http://www.iupac2003.org)>.

The IUPAC General Assembly, held from 9–17 August, is usually the occasion for meetings of the statutory bodies of the Union, specifically of the **Council, Bureau, Division Committees, and Standing Committees**. An Information Booklet was mailed last October, and all interested parties should now return their participation questionnaire no later than 1 April 2003.

A final schedule of meetings, with room assignments, will be distributed to all delegates at on-site registration. The final schedule will also be available on the IUPAC Web site a few weeks before the General Assembly.

 [www.iupac.org/symposia/conferences/ga03](http://www.iupac.org/symposia/conferences/ga03)

## Questions? Please write to

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## General Assembly Schedule as of 20 January 2003

AM: 09:00 to 13:00; PM: 14:00 to 18:00

President's Address and Members Reception	Sat, 9 Aug (19:00)
Congress Welcome Reception and Awards Ceremony for the winners of the IUPAC Prize for Young Chemists (Participation in this event requires that you register for the IUPAC Congress, or that you purchase an individual ticket)	Sun, 10 Aug (19:00)
Division Presidents and Secretaries Briefing	Sat, 9 Aug (08:00 to 09:00)
Division Committees all 8 Division Committees will hold a 2-day meeting Exception: the Inorganic Chemistry Division (Div II) will meet Sun, 10 Aug and Mon, 11 Aug	Sat, 9 Aug and Sun, 10 Aug (AM & PM)
Division Presidents	Tue, 12 Aug (PM)
Standing Committees	
CPEP	Sun, 10 Aug and Mon, 11 Aug (AM & PM)
CHEMRAWN	Mon, 11 Aug (AM & PM)
COCI	Mon, 11 Aug (AM & PM)
CHEMRAWN & COCI	Tue, 12 Aug (AM)
CCE	Mon, 11 Aug (AM & PM) and Tue, 12 Aug (AM)
CHEMRAWN & COCI & CCE	Tue, 12 Aug (PM)
ICTNS	Tue, 12 Aug and Wed, 13 Aug (AM & PM)
Project Committee	Tue, 12 Aug (AM)
Evaluation Committee	Wed, 13 Aug (AM)
Bureau	Wed, 13 Aug (PM) and Thu, 14 Aug (AM & PM) Sun, 17 Aug (13:00 to 14:30)
WCLM	Fri, 15 Aug (PM) (World Chemistry Leadership Mtg.)
Council	Sat, 16 Aug (AM & PM) and Sun, 17 Aug (AM)
Council Reception	Sat, 16 Aug (19:00)
Other Meetings	
Chemical Nomenclature and Structure Representation, Division VIII Open Meeting	Fri, 8 Aug (16:30 to 18:30)
CHEMRAWN Forum: <i>Innovation—from Pure to Applied Chemistry</i>	Sat, 9 Aug (AM & PM)
Analytical Chemistry Division Workshop on the Current Challenges and Needs for Analytical Chemistry	Sun, 10 Aug (AM)
Subcommittee on Materials Chemistry	Tue, 12 Aug (AM & PM)
Subcommittee on Macromolecular Terminology	Mon, 11 Aug to Thu 14 Aug (AM & PM)
Subcommittee on Solubility and Equilibrium Data	Mon, 11 Aug and Tue, 12 Aug (AM & PM)
Subcommittee on Public Understanding of Chemistry	Thu, 14 Aug (AM & PM; session CEO3 of the Congress)
International Council for Chemistry—Executive Committee	Sun, 17 Aug (15:00 to 17:00)

# New Directions for CHEMRAWN

It all started in 1976 *as the dream that came true*,\* when the CHEMRAWN—CHEMICAL Research Applied to World Needs—Committee was established following suggestions and plans for how IUPAC might help solve world problems through chemistry. A quarter century later, CHEMRAWN, and the series of conferences that bears the same acronym, is one of the most renowned activities of IUPAC.

The committee develops periodic conferences around the world to explore issues relevant to meeting human needs where chemical research and the products of chemical research can help to meet those needs. In doing so, the committee involves other organizations, public- and private-sector scientists, politicians, regulators, environmentalists, and other opinion leaders in developing and carrying out conferences. For each conference, a Future Actions Committee develops perspectives and actionable recommendations. The committee then tries to ensure that the recommendations are implemented.

The most recent CHEMRAWN Committee meeting was held in Paris in September 2002. *CI* asked its chair to review the committee plans and current activities.

\*History of IUPAC 1919-1987, by R. Fennell (IUPAC, 1994), p. 263.

**by Parry Norling**

The CHEMRAWN series of conferences has been an essential way for IUPAC to address issues that transcend pure science and have important socio-political aspects. Over the past quarter century, 12 CHEMRAWN conferences have been held that brought together experts in science and technology, including industrial leaders, government policymakers, academic scientists, and members of the general public. Together they

have explored, discussed, and debated how chemistry, chemical research, and chemical resources can help meet a major human need or solve a major problem.

Each conference has a Future Actions Committee that develops a set of perspectives and recommendations that can be widely distributed and in some cases catalyze follow-up actions. Following CHEMRAWN

## 12 CHEMRAWN Conferences Since 1978

I — Toronto, Canada (1978) Future Sources of Organic Raw Materials

II — Manila, Philippines (1982) Chemistry and World Food Supplies: The New Frontiers

III — The Hague, the Netherlands (1984) Resources Material Conversion

IV — Keystone, Colorado, USA (1985) Modern Chemistry and Chemical Technology Applied to the Ocean and its Resources

V — Heidelberg, Germany (1986) Current and Future Contributions of Chemistry to Health

VI — Tokyo, Japan (1987) Advanced Materials for Innovations in Energy, Transportation, and Communications

VII — Baltimore, Maryland, USA (1991) The Chemistry of the Atmosphere: Its Impact of Global Change

VIII — Moscow, Russia (1992) Chemistry and Sustainable Development

IX — Seoul, Korea (1996) Advanced Materials and Sustainable Development

X — Budapest, Hungary; Washington, DC, USA; Honolulu, Hawaii; and Brisbane, Australia (1999-2000) The Globalization of Chemical Education - Preparing Chemical Scientists and Engineers for Transnational Industries

XI — Montevideo, Uruguay (1998) Latin American Symposium on Environmental Analytical Chemistry

XIV — Boulder, Colorado, USA (2001) Toward Environmentally Benign Processes and Products

XIV, a training session in green chemistry was held in Thailand and several new green chemistry networks were established around the world. Following CHEMRAWN VII, a cooperative atmospheric monitoring effort—involving government, academia, and industry—was launched in the Peruvian Amazon Basin to gain a better understanding of carbon dioxide fluxes to and from the forest canopy.

At its September 2002 meeting in Paris, the CHEMRAWN committee discussed plans for five additional conferences:

XII—Senegal or South Africa (2005) Chemistry, Sustainable Agriculture, and Human Well Being in Sub-Saharan Africa (See page 8)

XIII—Pune, India (2003-2004) Cleaner Energy

XV—Paris, France (June 2004) Chemistry and Water

XVI—Ottawa, Ontario, Canada (August 2003) Forum: Innovation—from Pure to Applied Chemistry





## Feature

*The CHEMRAWN Committee at its meeting in Paris in September 2002. Front row: Prof. Patrick Moyna, Dr. John Malin, Prof. Fedor Kuznetsov, Prof. Erwin Buncel. Second row: Dr. Parry Norling, Dr. Min Che Chon, Prof. Raymond Hamelin. Back row: Dr. Alan Smith, Dr. Pierre Potier (President of the Maison de la Chimie, Paris), Dr. Jerzy Kopytowski, Prof. Ikenna Onyido, and Dr. Swaminathan Sivaram.*



XVII—Kingston, Ontario, Canada (2004-2005)  
Greenhouse Gas Mitigation

Several of these will be smaller, less expensive workshops, possibly "virtual conferences" or "think-tank" studies, given the difficulty in funding large conferences, such as some past events that cost as much as USD 400 000.

The committee developed a strategic plan which calls for:

- recruiting committee "associates" or friends to assist in carrying out CHEMRAWN work
- holding smaller regional workshops
- preparing research papers by committee members to alert IUPAC members about a growing world need and the particular role chemistry might play in meeting that need
- providing a Future Actions Committee for non-CHEMRAWN conferences

If the committee is successful in carrying out this plan, the CHEMRAWN conferences will continue to be a valuable activity of IUPAC. Anyone who would like to participate is invited to contact the committee chair Dr. Parry Norling. 🐼

Parry M. Norling <norling@rand.org> or <Parry.m.norling@usa.dupont.com> has been chair of the CHEMRAWN Committee since 1998 and a member since 1993. He is currently an AAAS Fellow at RAND's Science & Technology Policy Institute, in Arlington, Virginia, USA, and a Corporate Technology Adviser at DuPont.

## CHEMRAWN Forum: Innovation—from Pure to Applied Chemistry

If you are planning to attend the IUPAC General Assembly or Congress in Ottawa this coming August you may want to participate in the next CHEMRAWN Forum, entitled *Innovation—from Pure to Applied Chemistry*, on **9 August**.

Today's chemical industry is mature, with little payoff from investing in new products and minimal process innovation or fundamental breakthrough research. Do you have thoughts on what has been done or what can be done in regards to any of the following?

- enabling radical innovation

(new tools, software, market/technology intelligence, computerized methods, capturing emerging technologies)

- conducting breakthrough research (new ways to collaborate, smart scale-up techniques, lessons from the life sciences and the services sector, increasing the odds for success)
- knocking down the barriers to innovation (regulatory support/barriers, internal company practices, lack of talent or resources/killing the good idea)

If so, by **May 31**, send a short abstract (200 words) of a lecture you could give (or a paper that could be discussed at the Forum) to:

**Dr. Jerzy Kopytowski, Industrial Chemistry Research Institute, Warsaw, Poland**  
e-mail: [anna.czykwin@ichp.pl](mailto:anna.czykwin@ichp.pl) or  
fax: +48 22 7578793

👉 [www.iupac.org/projects/2003/2003-003-1-021.html](http://www.iupac.org/projects/2003/2003-003-1-021.html)

# CHEMRAWN XII

## World Conference on Chemistry, Sustainable Agriculture, and Human Well-Being in Sub-Saharan Africa

by Ikenna Onyido

The problems facing the African continent, especially the sub-Saharan region, are enormous and demand urgent action in order to avert impending tragedy. With a population of well over half a billion, which is still growing rapidly, increasing poverty levels, food insecurity, health and human well-being problems of disturbing proportions, and crumbling economies, the region presents a picture of misery that is a blight on modern civilization. Yet it is a certain fact that the region is well endowed with human and natural resources, which if properly harnessed and managed, shall usher in an era of development and prosperity that will make the region less of a liability to the developed world.

Of particular concern is the food and agriculture situation in sub-Saharan Africa, where food production levels are critically low in relation to the population. It is a well-known fact that the specter of hunger and famine hangs over the region in the foreseeable future if drastic ameliorating actions and initiatives are not undertaken. Agricultural production has largely remained in the hands of peasant small-holder farmers, who use traditional slash-and-burn, low-yielding modes of production, with outputs that at best satisfy subsistence levels. In some cases, modern agricultural methods have been introduced by multilateral, donor



World Health Organization/P. Virot

*Agricultural production in Africa has largely remained in the hands of small-holder farmers.*

and non-governmental agencies. However, short-term gains that are recorded often evaporate at the end of the intervention period because appropriate technologies have not been transferred to or understood by the local populations. The combined effects of traditional modes of production and ill-transferred technologies are manifested in continuing low productivity and environmental degradation. Thus, the cycle of poverty and hunger continues.

## Chemistry, Sustainable Agriculture, and Human Well-Being

In light of the scenario described above, the CHEMRAWN Committee believes that an effort should be undertaken to transfer proven chemical and soil management technologies to Africans. The idea is to impart to African people the knowledge and dynamic approaches that will help them anticipate problems and evolve timely solutions for creating sustainable agriculture, thereby raising the standard of living, especially of the rural majority. Consequently, the committee has approved CHEMRAWN XII, a Conference on Chemistry, Sustainable Agriculture, and Human Well-Being. The conference is intended to motivate sustained action so that over time, indigenous capacity can be built among the African people to ensure food self-sufficiency and food security in the long run.

CHEMRAWN II, a forerunner to this conference held in 1982, addressed the issue of "Chemistry and World Food Supplies: The New Frontiers." CHEMRAWN XII shall integrate recent advances in increasing food production with careful and responsible care of the environment, especially as applied to Africa.

## Overview of the CHEMRAWN XII Conference

Planned for 2005, the conference will focus on the following:

- creating awareness among African governments, the private sector and various stakeholders about the magnitude of the problem and the technological options available for enhancing food security and protecting the natural base in the region
- the transfer, adaptation, and application of the stock of available and affordable chemical knowledge and technology for addressing the problems of agricultural production and environmental management, especially in the areas of soil fertility, pest

## Feature

management, post-harvest storage and processing, and biotechnology

- the installation of pilot development and research projects in the different sub-regions to provide for collaboration between scientists drawn from Africa and other parts of the world through the activities of the conference's Future Actions Committee

Distinguished scientists and professionals from Africa and beyond who have contributed to the development of sustainable agriculture and responsible natural resource management will present plenary and invited papers. Scheduled lecturers include Thomas Odhiambo (Kenya), Francis Idachaba (ISNAR, The Hague), Avilio Franco (Brazil), Rattan Lal (USA), Christopher Chetsanga (Zimbabwe), and Patrick Ngoddy (Nigeria).

A decision shall soon be made about whether South Africa or Senegal will be the conference venue. The First Circular shall then be distributed with all the necessary details.

### Call for Papers and Appeal for Support


In order to plan effectively for the conference, we are asking scientists and professionals to become involved early enough to be ready to contribute papers for oral and poster presentation. We would also like to appeal to stakeholders and donor agencies for financial support to tackle this pressing issue. A number of international organizations have already given their endorsement for the proposed conference. Stakeholders, donor agencies, and scientists who



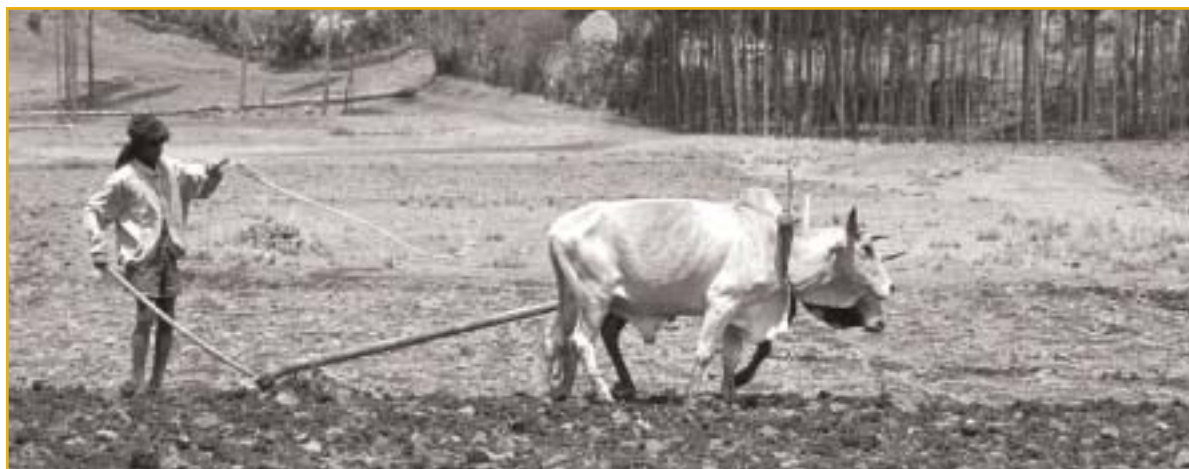
Source: UN World Food Programme

**Africa's Hunger Crisis: at least 38 million people in the countries highlighted above are suffering exceptional food shortages.**

would like to be part of this timely and worthwhile effort are invited to contact the chairman of the Conference Steering Committee at the following address:

Professor Ikenna Onyido  
Director, Centre for Agrochemical Technology  
University of Agriculture  
P.M.B. 2373, Makurdi, Nigeria  
E-mail: [ikennaonyido@yahoo.com](mailto:ikennaonyido@yahoo.com) 

 [www.iupac.org/projects/2001/2001-086-1-021.html](http://www.iupac.org/projects/2001/2001-086-1-021.html)



World Health Organization/P. Viro

*A man plows a field in Ethiopia.*

**T**he International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) is an IUPAC Associated Organization, which has maintained a formal relationship with the IUPAC Chemistry and Human Health Division for many years. The two organizations have partnered on a number of projects, including one that resulted in the IFCC-IUPAC coding system of properties and units in the clinical laboratory sciences. To present a broader picture of IFCC activities, *CI* asked IFCC Secretary Renze Bais, to review for us the nature and function of this federation.

## by Renze Bais

The IFCC's primary mission is to serve the public interest in healthcare by providing worldwide leadership in clinical laboratory science to national professional societies, the diagnostics industry, governments, and non-governmental organizations. The Federation was founded on 24 July 1952 and celebrated its 50th anniversary in 2002 at the XVIII International Congress of Clinical Chemistry in Kyoto, Japan.

## Membership and Objectives

The IFCC is a vibrant and highly respected international organization comprised of 79 Full Member national societies of clinical chemistry that together represent at least 30 000 clinical chemists worldwide. In addition, the Federation has 35 Corporate Members from the diagnostics and related industries that supply materials and services to laboratory medicine, and 4 Affiliate Members that are local professional societies with significant numbers of practicing clinical chemists who do not have access to the IFCC through a Full Member national society. The Federation also establishes and maintains contact with individual clinical chemists in parts of the world where there is no professional body specifically concerned with clinical chemistry and laboratory medicine. There are five formally defined aims of the Federation:

- to promote a vision of clinical chemistry and laboratory medicine that extends beyond traditional narrow perceptions of the field
- to transcend the boundaries of a single nation, a single corporation, or a geographical, cultural, or linguistic group of nations, in developing the field of clinical chemistry and laboratory medicine



www.ifcc.org/media

- to provide a forum for standardization, in the broadest sense, at a high level
- to disseminate information on "best practices" at various levels of technology and of economic development
- to complement and enhance the activities of its members

IFCC achieves its aims by publishing information and guidelines relating to the education of clinical chemists, by defining principles, and by publishing recommendations for the standardization of analytical procedures and the interpretation of analytical results. The Federation enhances communication and personal professional development by promoting congresses, conferences, and workshops in clinical chemistry and laboratory medicine, and by encouraging dialogue with clinicians on matters of common interest. More detailed information on the aims and objectives of the Federation, its statutes and rules, and all other matters, can be found on the IFCC Web site. See description on page 27.

## Organizational Structure and Operation

Much of the IFCC's business is carried out by divisions and committees, all of which are accountable (see diagram next page) to the Council of the Federation through an Executive Board. This organizational structure ensures that the IFCC fully achieves its aims. The Council is the governing body of the Federation and consists of one representative appointed by each Full Member, Affiliate Member, and Corporate Member. Council meets at the triennial International



Congress of Clinical Chemistry, but between Council meetings, the business of the IFCC is conducted by an Executive Board elected by Council. Any important matters that arise between Council meetings are decided by Full Member Representatives who vote by mail ballot on behalf of their societies.

There are currently four divisions—scientific, education and management, publications and communications, and congress and conferences—each of which may have committees and/or working groups undertaking specific tasks or projects. All National Society Members and Corporate Members of the Federation may nominate candidates for the divisions, committees, and working groups, but members are selected according to merit and expertise, irrespective of nationality or other affiliation. In addition to the divisions, an Archives Committee and an Ethics Committee also report directly to the Executive Board.

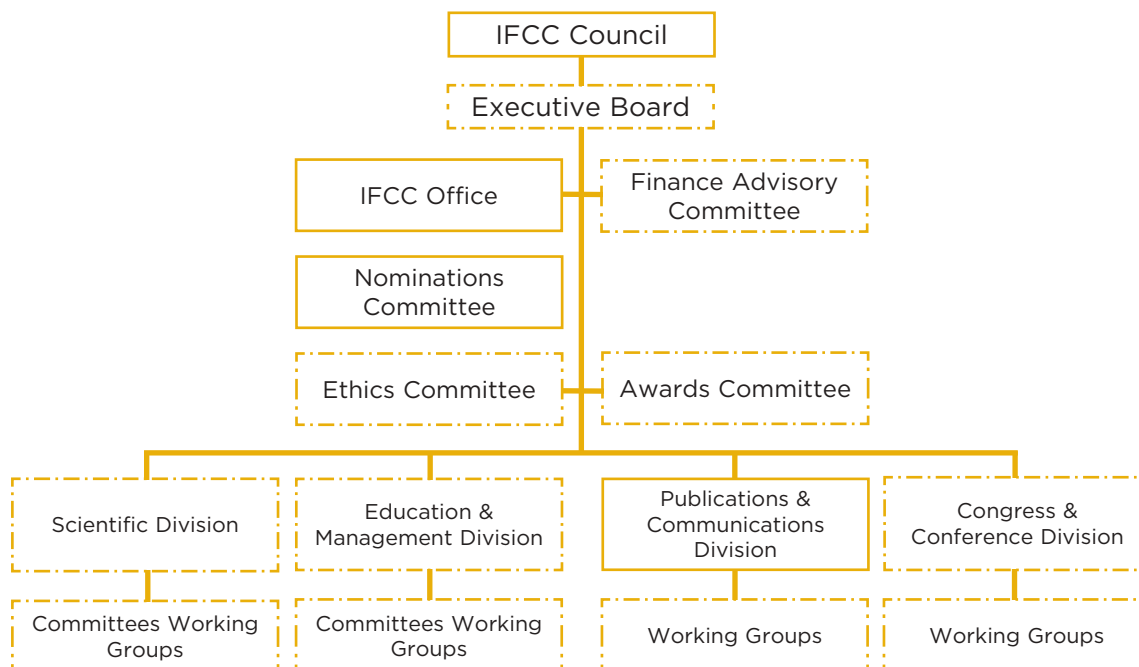
## Working with Other Organizations

Over the years, the growth of the scientific reputation of the IFCC, particularly in the areas of standardization and reference materials, together with recognition of the quality of its educational endeavors, have led to extensive cooperation with other international organizations. The earliest such relationship was with IUPAC, with whom formal reciprocal relations were maintained at Executive Board and divisional levels until the

year 2000. Throughout most of its history, the IFCC has also cooperated extensively with the World Health Organization (WHO) and undertaken projects on its behalf; the WHO, in turn, has helped the IFCC carry out some of its own projects.

In addition, the IFCC has actively sought to establish relevant contacts with international basic and applied science organizations to reduce duplicative efforts. There have been particularly productive arrangements with the International Committee for Standardisation in Haematology (ICSH), the International Society for Thrombosis and Haemostasis, the International Union of Biochemistry and Molecular Biology, the International Union of Immunological Societies, and the World Association of Societies of Pathology and Laboratory Medicine (WASPaLM). An important demonstration, for example, of the usefulness of such collaboration was the 1972 ICSH-IFCC-WASP joint recommendation on nomenclature in the presentation of results. More recently (1999), the IFCC and WASPaLM issued a joint statement on "Principles of Laboratory Accreditation."

The IFCC maintains relationships with important non-governmental organizations, including the International Organization for Standardization, the European Commission-Measurements and Testing Program, the International Organization for Legal Metrology, the Council of International Organizations of Medical Sciences, the International Union of



## Feature

Physiological Sciences, and the National Committee for Clinical Laboratory Standards. The IFCC and the European Institute for Reference Materials and Methods have an important, special relationship in which they jointly produce reference materials. To all of these formal contacts can be added the informal, personal relationships that individual clinical chemists who serve on IFCC groups have with these and other organizations.

The IFCC also works with regional organizations, such as the Arab Federation of Clinical Biochemistry, the Federation of European Societies of Clinical Chemistry, the Latin-American Confederation of Clinical Biochemistry, and the Asian-Pacific Federation of Clinical Biochemistry. The relationship between the IFCC and these four regional organizations is perhaps best described as symbiotic, because on the one hand, whilst the IFCC has assisted and encouraged these organizations in their contributions to local clinical chemistry, the membership of the IFCC has been increased through the regional activities. Examples of what the IFCC has provided the regional groups include the Visiting Lecturer Program and a Masters Degree course in Clinical Laboratory Science at the University of La Plata in Argentina.

### IFCC's Divisions and Committees

The main working activities of the IFCC are carried out through its four divisions. The Scientific Division is the largest, with 6 committees and 14 working groups carrying out specific projects on its behalf. Much of the work of the Education Division is also carried out by committees and working groups (currently eight in all). During the 1990s, in recognition of the movement from print to electronic media, the IFCC formed the Communication and Publications Division whose role is to coordinate communications and publications throughout the IFCC. This division has been responsible for developing the IFCC Web site and has recently launched an ebookshop associated with the site.

Another type of communication, person-to-person, is the responsibility of the Congress and Conference Division. Its primary mission is to oversee the organization of all international congresses of clinical chemistry and to develop the IFCC General and Master Discussion Conferences. The division also supports and provides advice as needed to organizers of regional congresses.

In addition to the four divisions, there are also two standing committees reporting directly to the Executive Board. One, the Ethics Committee, was cre-

ated in 2000/2001 so that our profession could respond to ethical issues raised by advances in genetics and the need for community education.


### Corporate Member Support

For many years, corporate members have recognized the excellent achievements of the IFCC by providing financial support for a number of regular events and awards. The most noteworthy of these are the Master Conferences sponsored by Roche Diagnostics and the Beckman-Coulter company and the following five prestigious awards: the Distinguished Clinical Chemist Award and the Henry Wishinsky Award for Distinguished International Service, both sponsored by Bayer; the IFCC Award for Distinguished Contributions in Education, sponsored by Beckman-Coulter; the IFCC Award for Significant Contributions in Molecular Diagnostics, sponsored by Abbott; the IFCC-Roche Award for Significant Advances in Critical Care Testing; and the IFCC/EDMA Award for Evidence of Effectiveness of Laboratory Tests. In 2002, our anniversary year, recipients received their awards during the XVIII International Congress of Clinical Chemistry in Kyoto, Japan.

### Conclusion

During its first 50 years, the IFCC has made a significant contribution to improvements in laboratory medicine. However, the organization is very aware of the challenges this century will hold, especially in developing countries, and is working closely with many national and international organizations to continue its role in improving healthcare throughout the world.

This summary of the activities of the IFCC has been largely taken from *IFCC Celebrating 50 Years* written by John Lines and Jacques Heeren and published by the IFCC in 2002.

For further information on IFCC, contact the office at Via Carlo Farini 81, I-20159 Milano, Italy. Tel: +39 02 6680 9912, Fax: +39 02 6078 1846, E-mail: [ifcc@ifcc.org](mailto:ifcc@ifcc.org), 

Renze Bais <[rbais@med.usyd.edu.au](mailto:rbais@med.usyd.edu.au)> is IFCC Secretary. He works at Express Laboratory at the Royal North Shore Hospital in Sydney, Australia.

 [www.ifcc.org](http://www.ifcc.org)

## It's A Chemical World—A Poster Competition

In collaboration with Science Across the World (SAW), the Committee on Chemistry Education's (CCE) Subcommittee on Public Understanding of Chemistry is pleased to announce a poster competition for students between the ages of 10–16, focusing on the importance of chemistry in the students' daily lives.

Possible subjects include, but are not limited to, the following:

- our world without chemistry
- chemistry and my body
- chemistry and life
- chemistry and food
- cooking up a chemical concoction
- chemistry in cosmetics
- chemistry in the medicine cabinet
- sustainable energy at home
- chemistry and renewable energy
- chemistry and plastics or polymers in everyday life

The posters can be submitted in any language, either on paper or electronically. For details on how to submit a poster and prize information, go to the Web site listed below.

Lida Schoen from SAW, and a member of the Subcommittee on Public Understanding of Chemistry, is the coordinator of the contest. SAW—whose motto is *exploring science locally, sharing insights globally*—manages a database of around 2000 school teachers from all over the world. If you're not familiar with SAW, have a look at [www.scienceacross.org](http://www.scienceacross.org).



Prizes will be awarded and all winning posters will be exhibited at the IUPAC Congress in Ottawa in August 2003. The display will coincide with the launch of IUPAC's Public Understanding of Chemistry initiative and with the special session held on the topic on Thursday 14 August 2003.

**The deadline for poster submission is 1 May 2003.**



[www.iupac.org/news/archives/2003/PUC-scienceacross.html](http://www.iupac.org/news/archives/2003/PUC-scienceacross.html)

## John Prausnitz Awarded the 2002 Rossini Lecture

John M. Prausnitz, a professor in the Chemical Engineering Department of the University of California, Berkeley, and a faculty senior scientist at the Lawrence Berkeley National Laboratory, was awarded IUPAC's 2002 Rossini Lecture, the highest international award in the field of chemical thermodynamics.

Prausnitz presented the Rossini Lecture at the 17th IUPAC Conference on Chemical Thermodynamics in Rostock, Germany on 28 July 2002.

An abstract of his presentation on "Molecular Thermodynamics for Some Applications in Biotechnology" appears below.

Prausnitz's research is aimed at obtaining, interpreting, and correlating thermodynamic properties of a variety of mixtures as required for process and product design in the chemical and related industries, including biotechnology. Toward that end, his laboratory obtains experimental data, performs Monte-Carlo molecular simulations, and develops molecular-thermodynamic models based on the statistical mechanics of fluids and solids.

Prausnitz received his Ph.D. from Princeton in 1955. He is a member of the National Academy of Sciences (1973), the National Academy of Engineering (1979), and the American Academy of Arts and Sciences (1988). He has received several honorary degrees: Doctor of Engineering from the University of L' Aquila, Italy, in 1983, and the Technical University of Berlin, Germany, in 1989, and a Doctor of Science from Princeton in 1995.



### Molecular Thermodynamics for Some Applications in Biotechnology—Prausnitz's abstract presented at the 17th ICCT.

As biotechnology sweeps the world, it is appropriate to remember that the great virtue of thermodynamics is its broad range of applicability. As a result, there is a growing literature describing how chemical thermodynamics can be used to inform processes for old and new biochemical products for industry and medicine. A particular application of molecular thermodynamics concerns separation of aqueous proteins by selective precipitation. For this purpose, we need phase dia-

grams; for constructing such diagrams, we need to understand not only the qualitative nature of phase equilibria of aqueous proteins but also the quantitative intermolecular forces between proteins in solution. Some examples are given to show how aqueous protein-protein forces can be calculated or measured to yield a potential of mean force and how that potential is then used along with a statistical thermodynamic model to establish liquid-liquid and liquid-crystal equilibria. Such equilibria are useful not only for separation processes but also for understanding diseases like Alzheimer's, cataracts, and sickle-cell anemia that appear to be caused by protein agglomeration.



[cheme.berkeley.edu/people/faculty/prausnitz/prausnitz.html](http://cheme.berkeley.edu/people/faculty/prausnitz/prausnitz.html)

### The Rossini Lecture—A Brief History

In recognition of the contributions of Prof. F. D. Rossini to the work of the IUPAC Commission on Thermodynamics and Thermochemistry during his 39-year membership (1934–1973), the Commission decided, in 1973, to institute a "Rossini Lecture," to be given during the IUPAC International Conferences on Chemical Thermodynamics. The first lecture was given by Prof. Rossini himself at the Fourth Conference held in August 1975 in Montpellier, France. Rossini lecturers were appointed by the Commission on Thermodynamics until 2002, but, as a result of the restructuring of IUPAC, they will be elected in the future by the Board of Directors of the newly established International Association of Chemical Thermodynamics. The text of these lectures is published in *Pure and Applied Chemistry* (see table) and in the *Journal of Chemical Thermodynamics* (see table).

### Freedom of Access to Primary Experimental Data

For science to progress it is critical that research results are disseminated as widely as possible, and in particular that primary experimental data are freely available in perpetuity. In 1998, as a result of concern amongst the scientific community over this issue, the International Council for Science (ICSU) set up an Inter-Union Bioinformatics Group (IUBG) to consider this and related matters, with particular emphasis on bioinformatics. The issue of free access is particularly relevant now in relation to the availability of data from genomic and proteomic studies.

### Rossini Lectures, 1975-2003

1975	<b>Frederick D. Rossini</b> Montpellier, France, 26-30 Aug 1975 <i>JCT</i> 1976, <b>8</b> , 803-834
1977	<b>Henry A. Skinner</b> Ronneby, Sweden, 23-26 Aug 1977 <i>JCT</i> 1978, <b>10</b> , 309-320
1980	<b>Stig A. Sunner</b> Merseburg, Germany, 26-29 Aug 1980 (died before his Lecture)
1982	<b>Edgar F. Westrum</b> (University of Michigan, USA) London, UK, 6-10 Sep 1982 <i>PAC</i> 1983, <b>55</b> (3), 539-551; <i>JCT</i> 1983, <b>15</b> , 305-325.
1984	<b>Maxwell L. McGlashan</b> (University College, London, UK) ICCT, Hamilton, Ontario, Canada, 13-17 Aug 1984 <i>PAC</i> 1985, <b>57</b> (1), 89-103; <i>JCT</i> 1985, <b>17</b> , 301-319.
1986	<b>Ernst-Ulrich Franck</b> (Universität Karlsruhe, Germany) 9th ICCT, Lisbon, Portugal, 14-18 Jul 1986 <i>PAC</i> 1987, <b>59</b> (1), 25-34; <i>JCT</i> 1987, <b>19</b> , 225-242
1988	<b>Kenneth S. Pitzer</b> (UC Berkeley, CA, USA) 10th ICCT, Prague, Czechoslovakia, 29 Aug — 3 Sep 1988 <i>PAC</i> 1989, <b>61</b> (6) p. 979-988; <i>JCT</i> 1989, <b>21</b> , 1-17
1990	<b>Gerhard M. Schneider</b> (Ruhr-Universität Bochum, Germany) 11th ICCT, Como, Italy, 26-31 Aug 1990 <i>PAC</i> 1991, <b>63</b> (10), 1313-1326; <i>JCT</i> 1991, <b>23</b> , 301-326.
1992	<b>John S. Rowlinson</b> (Oxford, UK) 12th ICCT, Snowbird, Utah, USA, 16-21 Aug 1992 <i>PAC</i> 1993, <b>65</b> (5), 873-882; <i>JCT</i> 1993, <b>25</b> , 449-461.
1994	<b>Hendrick C. Van Ness</b> (Rensselaer Polytechnic Institute, Troy, NY, USA) 13th ICCT, Clermont-Ferrand, France, 17-22 Jul 1994 <i>PAC</i> 1995, <b>67</b> (6), 859-872; <i>JCT</i> 1995, <b>25-27</b> , 113-134.
1996	<b>Robert A. Alberty</b> (MIT, Cambridge, MA, USA) 14th ICCT, Toyonaka, Osaka, Japan, 25-30 Aug 1996 <i>PAC</i> 1997, <b>69</b> (11), 2221-2230; <i>JCT</i> 1997, <b>29</b> , 501-516.
1998	<b>Stanley I. Sandler</b> (University of Delaware, Newark, DE, USA) 15th ICCT, Porto, Portugal, 26 Jul - 1 Aug 1998 <i>PAC</i> 1999, <b>71</b> (7), 1167-1181; <i>JCT</i> 1999, <b>31</b> , 3-25.
2000	<b>William A. Wakeham</b> (University of Southampton, UK) 16th ICCT, Halifax, Nova Scotia, Canada, 6-11 Aug 2000 <i>JCT</i> 2001, <b>33</b> , 1623-1642; <i>PAC</i> 2000, <b>72</b> (10) includes other presentations pp. 1799-2082.
2002	<b>John M. Prausnitz</b> (UC Berkeley, CA, USA) 17th ICCT, Rostock, Germany, 28 Jul - 2 Aug 2002



The purpose of the group was defined as follows:

- to monitor worldwide developments in bioinformatics
- to take measures as required to ensure and facilitate inter-process communication, such as standardization of data formats
- to act when the continuity or reliability of key informatics providers is endangered
- to act when the free access to data in the public domain is endangered
- to catalyze actions by the appropriate authorities in areas of the world where Internet access to servers and data providers is technically inadequate
- to organize relevant educational activities

IUBG released a report in May 2002, endorsed by ICSU in September 2002, covering many of the above topics. It is available at <[md.chem.rug.nl/~berends/IUBG-FinalReport.html](http://md.chem.rug.nl/~berends/IUBG-FinalReport.html)>.



The report contains a number of statements and recommendations aimed at international unions, scientific societies, funding agencies, legislators, for-profit organizations, publishers and authors, committees for nomenclature and standardization, and educational institutions.

Please direct questions or comments to Alan McNaught <[adm@rsc.org](mailto:adm@rsc.org)>, IUPAC representative on the IUBG.



[www.iupac.org/news/archives/2002/IUBG-report.html](http://www.iupac.org/news/archives/2002/IUBG-report.html)

### Maintaining the Permanent Availability of the Digital Records of Science

#### A Statement by the International Council for Scientific and Technical Information

Following are excerpts from the ICSTI's statement on preserving digital information released in December 2002:

"Despite the growing efforts of many of the varied stakeholders involved in generating, organizing, and providing access to scientific information and data, much of it in digital form is still at risk of being lost to future generations.

The same can be said of the digital data collected over the past 40 years. Data from the Viking mission to Mars is just one example of expensively gathered, important information that has already been lost.

More needs to be done as a matter of urgency to put in place systematic structures which can ensure the long-term availability of the records of science to all who need them, bearing in mind the special difficulties that developing countries have in accessing digital publications."

The ICSTI document describes succinctly the nature of the problem and who can solve it and concludes with the following recommendations:

"ICSTI urges the International Council for Science and its scientific unions to:

- Undertake for each of the scientific disciplines a high-level audit of digital preservation policies and practices that are now in place (ICSTI welcomes the lead taken by IUPAP in proposing a system to monitor electronic publishing and preservation practices in pure and applied physics.)
- Work with the other key stakeholders in defining user requirements for archives.

Because scientific information and data generation has a national as well as an international dimension;

- It urges the National Academies to sponsor similar audits on a national basis.
- It recommends that all agencies funding scientific research should formulate and publish policies on the preservation of the research they fund.

ICSTI recommends that all scientists undertaking research should bear in mind the importance of the long-term preservation of the data and information they generate and adopt such standards as are recommended to facilitate this."

Please address questions and comments to Wendy A. Warr <[wendy@warr.com](mailto:wendy@warr.com)>, IUPAC representative on the ICSTI.



[www.icsti.org/advocacy\\_statement.html](http://www.icsti.org/advocacy_statement.html)



## Structure and Properties of Polyester Elastomers Composed of Poly(butylene terephthalate) and Poly( $\epsilon$ -caprolactone)

Rubber, which shows very unique properties of low modulus and high extensibility, differently from other solids such as metal and ceramic, is now used in a variety of phases in daily life. To apply rubber to actual uses, vulcanization (i.e., the introduction of crosslinks) is needed. The disadvantage of this process is that rubber is not so high in productivity as well as operability. Recently, thermoplastic elastomers have been used to improve the processability of rubber materials, resulting in a major innovation in the rubber industry as well as in the field of polymer science. These rubber materials, which have no need for vulcanization and can be easily recycled, have attracted great scientific and academic interest.

The mechanical performance of the thermoplastic elastomers is strongly affected by the higher-order structure of hard segments of the chains. Typically, the domain is a glassy amorphous phase or a crystalline phase. Among the several types of thermoplastic elastomers, the polyester-type elastomers are specifically interesting because the mechanical properties cover from rubber to plastics, in some cases to engineering plastics, according to the structure of the crystalline domain of hard segments. The aim of this project is to make clear the structure-properties relation of polyester-type elastomers categorized in "engineering elastomers," composed of poly(butylene terephthalate) as the hard segment and poly( $\epsilon$ -caprolactone) or poly(tetramethyleneglycol) as the soft segment. The project is composed of the following six research topics:

- 1) molecular structure
  - blockiness/sequence distribution
  - molecular weight/ MW distribution
- 2) aggregate structure and deformation mechanism
  - POM studies
  - SAXS/WAXD studies
  - SALS studies
- 3) melt rheology
  - dynamic viscoelasticity
  - stress relaxation
  - shear/elongational viscosities
- 4) mechanical properties
  - stress-strain relationship

- elastic recovery/hysteresis
- 5) blends with other polymers
- 6) degradation

For more information, contact the Task Group Chairman Toshikazu Takigawa <[takigawa@rheogate.polym.kyoto-u.ac.jp](mailto:takigawa@rheogate.polym.kyoto-u.ac.jp)>.



[www.iupac.org/projects/2002/2002-052-1-400.html](http://www.iupac.org/projects/2002/2002-052-1-400.html)

## Recent Advances in Electroanalytical Techniques: Characterization, Classification, and Terminology

The IUPAC technical report *Classification and Nomenclature of Electroanalytical Techniques* (Rules Approved 1975), *Pure Appl. Chem.*, **45** (2-C) 83, 1976, has not been updated for over 25 years. The material based on this document, which is embodied in chapter 8 of the IUPAC "Orange Book," is therefore also out of date. During recent decades, several electroanalytical techniques lost their importance (e.g., differential voltammetry or Kalousek polarography), while new techniques have been developed and have found widespread use (e.g., square wave voltammetry, electrochemical impedance spectroscopy, or hyphenated techniques, such as those accomplished with the use of the electrochemical quartz crystal microbalance). There is thus a clear need for a modern document concerning the characterization, classification, and recommendation of the relevant terminology for the new and currently used electroanalytical techniques.

The objective of this project is to revise and update the outdated IUPAC report and publish it in both print and electronic form. This will facilitate the updating of the Orange Book and relevant terms in the Gold Book. It will provide, in a concise form, a contemporary source of characterization, classification, and terminology of electroanalytical techniques for a broad audience of analytical, physical, inorganic, organic, environmental, and clinical chemists. These techniques are widely used in academic research and teaching laboratories as well as clinical, environmental, and industrial analytical laboratories.

For more information, contact the Task Group Chairman Włodzimierz Kutner <[wkutner@ichf.edu.pl](mailto:wkutner@ichf.edu.pl)>.



[www.iupac.org/projects/2002/2002-002-2-500.html](http://www.iupac.org/projects/2002/2002-002-2-500.html)

## Metrological Traceability of Measurement Results in Chemistry

In recent years, the concept of "traceability" in chemical measurement has received an extraordinary amount of attention. It has been the theme of numerous workshops and symposia. It is frequently used in the chemical literature as an accepted concept with a seemingly obvious meaning. Demonstration of metrological traceability is required in documents from the International Standards Organization (ISO), International Laboratory Accreditation Cooperation (ILAC), and the Bureau International des Poids et Mesures (BIPM), among others, which makes its implementation almost compulsory for any measurement laboratory. (In this project, the systematic term "metrological traceability" is used to distinguish the concept from other types of traceability such as documentary traceability and material traceability.)

However, many people concerned with metrology in chemistry tacitly or privately concur that there is no unequivocal, internationally agreed definition of traceability of a measurement result in chemistry. This is a rather remarkable state of affairs because lack of clarity about such an important and widely used concept makes it difficult to reach world-wide agreement on its use. There are only a few examples of documented traceability of chemical measurement results produced by field laboratories, reference material producers, or even national metrology institutes.

The definition of traceability in the *International Vocabulary of Basic and General Terms in Metrology* (1993) reads:

**traceability:** property of the result of a measurement or the value of a standard whereby it can be related to stated references, usually national or international standards, through an unbroken sequence of comparisons all having stated uncertainties (VIM 6.10—ref: BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML, *International Vocabulary of Basic and Metrological Terms in Metrology*, 2nd edition, ISO GenÈve, 1993)

The first step toward clarification of the concept "metrological traceability" is to state some current problems:

- the lack of understanding that metrological traceability to a common stated metrological reference is a precondition for comparability of measurement results
  - the widespread perception that a unit from the International System of Units (SI) is the only possible stated metrological reference in metrological traceability of chemical measurement results
  - the claim that a measurement result can be metrologically traceable to an institution
  - the lack of clarity of the distinction between metrological traceability and measurement uncertainty
  - the confusion between the quantity value carried by an artifact used as a calibrator and the artifact itself
  - the fact that few certified reference materials or CRM certificates indicate the metrological traceability of the certified quantity value(s)
  - the belief that the use of a (C)RM as a so-called "trueness control" material establishes metrological traceability
  - the assumption that participation in an interlaboratory comparison or proficiency testing scheme provides metrological traceability of a measurement result
  - the belief that metrological traceability is a property of a material, measurement method, or measurement procedure
  - the use of inaccurate language such as "traceability to the SI"
  - the lack of a definition of the concept "traceability chain"
  - the lack of a definition of the concept "stated metrological reference"
  - the perception that metrological traceability does not apply to measurement results in routine laboratories
- These problems hamper communication about measurement. Numerous interactions with analytical chemists around the world have revealed that basic concepts in metrology, with very few exceptions, are not included anymore in the text books of analytical chemistry. This may be an underlying reason for many of the listed problems.

To address this situation, IUPAC has approved a project on metrological traceability, which has the following objectives:

- to elucidate the concept "metrological traceability" of a measurement result and list its characteristics, and to describe the relations between metrological traceability and other concepts such as calibration, measurement uncertainty, and comparability
- to formulate requirements for establishing metrological traceability

## The Project Place

- to give specific examples of metrological traceability of chemical measurement results

The project task group is highly interdivisional and includes members from the Commission on Isotope Abundances and Atomic Weights of the Inorganic Chemistry Division; the Subcommittee on Nomenclature, Properties, and Units in Laboratory Medicine of the Chemistry and Human Health Division; the Interdivisional Working Party for Harmonization of Quality Assurance; and the Analytical Chemistry Division. A draft report will be circulated extensively within IUPAC for comment. The amended final version will be published in *Pure and Applied Chemistry*. Interested readers are invited to consult the IUPAC Web site and follow the link to the project home page, or consult with the Task Group Chairman Paul De Bièvre <paul.de.bievre@skynet.be>.



[www.iupac.org/projects/2001/2001-010-3-500.html](http://www.iupac.org/projects/2001/2001-010-3-500.html)

### Environmental Implications of Endocrine Active Substances

The International SCOPE/IUPAC Symposium on Endocrine Active Substances (EASs), held 17–21 November 2002 in Yokohama, Japan, was a major milestone in the project coordinated by the Chemistry and the Environment Division and led by Dr Junshi Miyamoto. (SCOPE is the Scientific Committee on Problems of the Environment of the International Council for Science.) The project objectives are to critically evaluate the issues relating to the effects of EASs on man and the environment, to prioritize research needs, and to offer some manageable actions facilitating risk assessment and risk communication. The symposium was organized around four major topics:

- molecular mode of action of nuclear receptors
- environmental fate and metabolism of EASs
- toxicological effects of EASs and risk assessment for humans
- effects of EASs in wildlife species

Eminent international experts were invited to cover these issues in a total of 55 sub-topics and there were 6 supplementary workshops addressing related issues. Additionally there were poster sessions for submitted papers and for the 55 main, orally presented sub-topics (a rather unique, but effective way of encouraging dia-



*Efforts are underway to improve EAS exposure assessments in humans and animals.*

logue). The excellent facilities of the Yokohama Convention Center proved equal to the task of accommodating over 350 participants. The culmination of the project will be the publication during 2003 of the final report in *Pure and Applied Chemistry* containing the 55 manuscripts for the sub-topics (with conclusions and recommendations) and an executive summary.

The overall recommendations for risk management of EASs are as follows:

- Environmental monitoring programs should be focused on high priority EASs, including relevant metabolites, and be designed to support exposure assessment.
- Quantitative correlations for chemical analyses and bioassays (TIE) should be used to reevaluate the biological relevance of target EASs for monitoring programs.
- In addition to source control, available technologies for reducing environmental entry should also be considered.

Research priorities to improve exposure assessment of humans and wildlife are as follows:

- increased reliability of detection methods for EASs
- elucidation of metabolic pathways, including potential activation vs. detoxification
- key environmental fate parameters should be generated for highly active EASs (e.g., steroid hormones, certain industrial chemicals, drugs)
- improved models for exposure assessments
- development of more efficient processes for reducing environmental loadings



## The Project Place

Overall, this timely project of broad and far-reaching scope will result in authoritative reviews, conclusions, and recommendations for all topics important to understanding significance of EASs. Publication in *Pure and Applied Chemistry* is planned for 2003. The symposium was a very successful step in progressing toward these objectives.

This project update was prepared by Patrick T. Holland <patrickh@cawthron.org.nz>, secretary of the Chemistry and the Environment Division. For more information contact Dr. Junshi Miyamoto <miyamoto-junshi@cerij.or.jp>.



[www.iupac.org/projects/2000/2000-016-1-600.html](http://www.iupac.org/projects/2000/2000-016-1-600.html)

### The Revision of the IUPAC Compendium of Chemical Terminology (The "Gold Book")

This valuable collection of definitions draws upon the recommendations already published in *Pure and Applied Chemistry*, the IUPAC "Color Books," the nomenclature and terminology documents issued by IUPAC commissions, and, to a small extent, ISO and other sources. The first edition, published in 1987, was the brainchild of Victor Gold, and the second edition, compiled by Alan McNaught and Andrew Wilkinson, published in 1997, mostly contained definitions issued up to the end of 1995. The first and second editions were published in hard-back form and the second edition became available on the Web, and that is now considered to be the best form of publication.

Approval has now been given for a further revision of the text to bring it right up to date on the Web. The Task Group Chairman is Prof. Aubrey Jenkins, who has assembled a group of associates representing the entire spectrum of IUPAC interests. All the relevant material that has been recommended since the publication of the second edition will be scrutinized and considered for inclusion. Once this task has been completed, it should be a simple matter to add new terms continually to the collection year by year, month by month, or even week by week.

For more information, contact the Task Group Chairman Aubrey D. Jenkins <adjjj@jjadjj.u-net.com>.



[www.iupac.org/projects/2001/2001-062-2-027.html](http://www.iupac.org/projects/2001/2001-062-2-027.html)

## Provisional Recommendations

### IUPAC Seeks Your Comments

Provisional recommendations are drafts of IUPAC recommendations on terminology, nomenclature, and symbols made widely available to allow interested parties to comment before the recommendations are finally revised and published in *Pure and Applied Chemistry*.

Recommendation for the Naming of Element of Atomic Number 110

A joint IUPAC-IUPAP Working Party (JWP) has confirmed the discovery of element number 110 with the collaboration of Hofmann *et al.* from the Gesellschaft für Schwerionenforschung mbH (GSI) in Darmstadt, Germany. In accord with IUPAC procedures, the discoverers have proposed a name and symbol for the element. The Inorganic Chemistry Division Committee now recommends this proposal for acceptance. The proposed name is **darmstadtium** with symbol **Ds**. This proposal lies within the long established tradition of naming an element after the place of its discovery. The full text is available online, see link below.

#### Comments by 30 June 2003

To Prof. John Corish  
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Chemistry Department, Trinity College  
Dublin 2, Ireland  
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[www.iupac.org/reports/provisional/abstract03/corish\\_300603.html](http://www.iupac.org/reports/provisional/abstract03/corish_300603.html)

## Nomenclature of Regular Single-Strand Organic Polymers (IUPAC Recommendations 2002)

by J. Kahovec, R. B. Fox, and K. Hatada

*Pure and Applied Chemistry*,

Vol. 74, No. 10, pp. 1921-1956 (2002)

The rules described here of structure-based nomenclature for regular single-strand organic polymers are of fundamental importance. The names of other kinds of polymers such as double-strand and irregular polymers are based on the principles given in this document.

In concept, a generic name for the polymer  $(ABC)_n$  is poly(ABC), in which (ABC) is a constitutional repeating unit (CRU) representing the chemical structure of the polymer chain, and A, B, and C are the subunits (SUs) that comprise the CRU. To provide a

unique and unambiguous name, rules are given to identify the preferred CRU and to name it using the names of A, B, and C based on current organic nomenclature. The CRU consists of one or more divalent or substituted SUs, from which the structure-based name poly(SU<sub>1</sub>-SU<sub>2</sub>-SU<sub>3</sub>-...) is derived. Special rules of seniority for various types of subunits determine at which subunit to start and in which direction to continue citing subunits in the CRU of the polymer. Provisions are made for naming end groups of the polymers and the polymer substituents.

In addition, the document contains a glossary of concepts and definitions, a list of common subunit names, and a variety of examples of structure-based polymer names. The document is a revision of the 1975 rules, but the new rules do not represent any change in principles. The new rules involve mainly

Structure	Source-based name (preferred given first)	Structure-based name
$\text{-(CHCH}_2\text{)}_n$   CH <sub>3</sub>	polypropene polypropylene (PP)	poly(1-methylethylene)
$\text{-(CH=CHCH}_2\text{CH}_2\text{)}_n$	poly(buta-1,3-diene) 1,4-polybutadiene	poly(but-1-ene-1,4-diyl)
$\text{-(C=CHCH}_2\text{CH}_2\text{)}_n$   CH <sub>3</sub>	polyisoprene	poly(1-methylbut-1-ene-1,4-diyl)
$\text{-(CHCH}_2\text{)}_n$   C <sub>6</sub> H <sub>5</sub>	polystyrene (PS)	poly(1-phenylethylene)
$\text{-(CHCH}_2\text{)}_n$   CN	polyacrylonitrile (PAN)	poly(1-cyanoethylene)
$\text{-(CHCH}_2\text{)}_n$   OH	poly(vinyl alcohol) (PVAL)	poly(1-hydroxyethylene)
$\text{-(CHCH}_2\text{)}_n$   OCOCH <sub>3</sub>	poly(vinyl acetate) (PVAC)	poly(1-acetoxyethylene)
$\text{-(CHCH}_2\text{)}_n$   Cl	poly(vinyl chloride) (PVC)	poly(1-chloroethylene)
$\text{-(CF}_2\text{)}_n$	poly(tetrafluoroethene) poly(tetrafluoroethylene) (PTFE)	poly(difluoromethylene)
$\text{-(C(CH}_3\text{)CH}_2\text{COOCH}_3\text{)}_n$	poly(methyl methacrylate) (PMMA)	poly[1-(methoxycarbonyl)-1-methylethylene]
$\text{-(OCH}_2\text{CH}_2\text{)}_n$	poly(ethylene oxide) (PEO)	poly(oxyethylene)
$\text{-(NHCO(CH}_2\text{)}_5\text{)}_n$	poly(hexano-6-lactam) poly( $\epsilon$ -caprolactam) (Nylon 6)	poly[imino(1-oxohexane-1,6-diyl)]
$\text{-(NHCH}_2\text{CH}_2\text{)}_n$	polyaziridine poly(ethylenimine) (PEI)	poly(iminoethylene)

Example names of some regular single-strand organic polymers

rearrangement of the material, a generalization of basis rules, a clearer presentation, an avoidance of manifold repetition of the same principles at various places, and the use of graphical means for the visualization of the principles.



[www.iupac.org/publications/pac/2002/7410/7410x1921.html](http://www.iupac.org/publications/pac/2002/7410/7410x1921.html)

## Natural and Synthetic Substances Related to Human Health (IUPAC Technical Report)

by J. G. Topliss, A. M. Clark, E. Ernst, C. D. Hufford, G. A. R. Johnston, J. M. Rimoldi, and B. J. Weimann  
*Pure and Applied Chemistry*,  
Vol. 74, No. 10, pp. 1975–1985 (2002)

There is a widespread belief on the part of the general public that natural substances are inherently superior to synthetic substances with regard to efficacy and safety in matters related to human health. This question is examined by reviewing the therapeutic use of drugs and herbal medicine preparations, the role of vitamins and nutrients, and the effects of toxic substances.

Substances produced in nature exhibit a variety of properties with respect to their effects on human health. These effects range from controlling regulatory processes essential for human life, serving as nutrients, acting as medicinal agents to cure or alleviate disease (either as single substances or mixtures as in herbal preparations), to producing extreme toxicity. Many have both favorable and unfavorable effects, often dose dependent. Even some vitamins can have untoward effects at very high doses, and the most potent natural toxin of all, botulinum, is used as a drug in minute doses to treat some conditions involving involuntary muscle contractions.

Natural substances originate from a wide variety of living organisms and serve different purposes. In addition to those that serve essential roles in human life, such as vitamins and nutrients, some are noxious and act as defense mechanisms against predators, while others paralyze prey. Yet others may have no obvious purpose but are metabolic end products that may possess all manner of properties from useful to harmful. These include genistein, widely distributed in plants, which in animal tests can disrupt endocrine function, and the botulinum toxins. Herbal products used as medicinal agents may have both harmful and beneficial effects in humans, and have not been sub-

jected to the same rigorous standards of efficacy, safety, and purity accorded single chemical entities approved as drugs by regulatory agencies. The chemical structures of natural products are diverse and complex. Natural products provided the earliest medicinal agents—both complex mixtures from botanical preparations and single drug substances—long before synthetic organic chemistry developed to the stage where it could be an important route to new drugs. Natural products continue to be important today as sources of new drugs.

Synthetic substances, produced by chemical synthesis from basic chemical building blocks and utilized for a variety of purposes, have proliferated over the last half century as synthetic methodology and production technology have developed to highly sophisticated levels. Modern drug research is now predominantly based on substances produced by chemical synthesis, which involves the use of computer-aided drug design, combinatorial libraries, and structural optimization of lead compounds of both natural and synthetic origin to maximize the benefit-risk ratio. However, the discovery of bioactive natural products, which serve as leads for new drugs, remains an important drug discovery strategy. On the other hand, herbal products, for better or worse, remain essentially as the plant produced them: complex multicomponent mixtures that are often not well characterized or understood. Greater understanding will only be achieved as rigorous and well-designed scientific studies are conducted to examine the properties of these products that are consumed by millions of people each year.

The introduction and use of synthetic substances for various industrial purposes, in addition to impurities arising from industrial processes, have resulted in exposure to toxicity risk. Of course, a high level of toxicity is the intended purpose of a nerve gas. Pesticides can be toxic to humans, and dioxins are toxic substances, products of combustion, which can be generated through natural events such as forest fires or industrial processes. DDT, PCBs, and phthalate plasticizers are synthetic substances that pose risks as disruptors of endocrine function.

Another type of substance is a natural one that has been modified by a chemical synthesis process to a semisynthetic derivative in order to improve its properties. Examples include the numerous antibiotic semisynthetic penicillin and cephalosporin drugs and vitamin derivatives that improve stability. Natural substances that are also available in an identical

## Making an imPACT

molecular form by synthesis, represent another distinct category. A typical example is vitamin C, which is produced commercially by synthesis, and the synthetic substance is referred to as a nature-identical vitamin.

In conclusion, from the examples presented in this article, it is clear that natural and synthetic substances have a similar overall range of properties with regard to efficacy and safety, in terms of their impact on human health. The actions of individual substances are determined by their molecular structures and dose, not whether they are of natural or synthetic origin.



[www.iupac.org/publications/pac/2002/7410/7410x1957.html](http://www.iupac.org/publications/pac/2002/7410/7410x1957.html)

### Isotope-Abundance Variations of Selected Elements (IUPAC Technical Report)

by **T. B. Coplen, J. K. Böhlke, P. DeBièvre, T. Ding, N. E. Holden, J. A. Hopple, H. R. Krouse, A. Lamberty, H. S. Peiser, K. Rólvás, S. E. Rieder, K. J. R. Rosman, E. Roth, P. D. P. Taylor, R. D. Vocke, Jr., and Y. K. Xiao**  
*Pure and Applied Chemistry*,  
Vol. 74, No. 10, pp. 1987-2017 (2002)

Documented variations in the isotopic compositions of some chemical elements are responsible for expanded uncertainties in the standard atomic weights published by IUPAC's Commission on Atomic Weights and Isotopic Abundances. This report summarizes reported variations in the isotopic compositions of 20 elements due to physical and chemical fractionation processes (not due to radioactive decay) and their effects on the standard atomic-weight uncertainties. For 11 of those elements (hydrogen, lithium, boron, carbon, nitrogen, oxygen, silicon, sulfur, chlorine, copper, and selenium), standard atomic-weight uncertainties have been assigned values that are substantially larger than analytical uncer-

tainties because of common isotope-abundance variations in materials of natural terrestrial origin. For two elements (chromium and thallium), recently reported isotope-abundance variations potentially are large enough to result in future expansion of their atomic-weight uncertainties. For seven elements (magnesium, calcium, iron, zinc, molybdenum, palladium, and tellurium), documented isotope variations in materials of natural terrestrial origin are too small to have a significant effect on their standard atomic-weight uncertainties.

This compilation indicates the extent to which the atomic weight of an element in a given material may differ from the standard atomic weight of the element. For most elements given above, data are graphically illustrated by a diagram in which the materials are specified in the ordinate and the compositional ranges are plotted along the abscissa in scales of (1) atomic weight, (2) mole fraction of a selected isotope, and (3) delta value of a selected isotope ratio.



[www.iupac.org/publications/pac/2002/7410/7410x1987.html](http://www.iupac.org/publications/pac/2002/7410/7410x1987.html)

### Errata. Generic Source-Based Nomenclature for Polymers (IUPAC Recommendations 2001) *Pure Appl. Chem.* **73**, 1511-1519 (2001)

*Pure and Applied Chemistry*, Vol. 74, No. 10, p. 2019 (2002)



[www.iupac.org/publications/pac/2002/7410/7410x2019.html](http://www.iupac.org/publications/pac/2002/7410/7410x2019.html)

### Translations of the "Blue Book"—A Guide to IUPAC Nomenclature of Organic Compounds (recommendations 1993)

- in Portuguese—prepared by A.C. Fernandes, B. Herold, H. Maia, A.P. Rauter and J.A.R. Rodrigues; Liedel, 2002 [ISBN 972-757-150-6]

- in Croatian—prepared by V. Ropic; Skolska Knjiga, Zagreb, 2002 [ISBN 953-0-30917-1]



[www.iupac.org/publications/books/seriestitles/nomenclature.html](http://www.iupac.org/publications/books/seriestitles/nomenclature.html)

# Bookworm

## Polymer Membranes

J. Kahovec (symposium ed.)  
*Macromolecular Symposia*, Vol 188.  
Wiley-VCH, 2002, pp. 1-165  
(ISBN 3-527-30478-9)

In the last decades, investigation in the field of preparation and application of polymer membranes achieved remarkable success. A large number of papers and conference contributions devoted to this topic reflect the fast development of membrane research.

With the aim of meeting an ever-increasing interest in synthetic polymer membranes and their utilization in modern technologies, the well-known Prague Meetings on Macromolecules (P. M. M.) focused the issue of membranes in a recent symposium. The 41st Microsymposium of P. M. M. on "Polymer Membranes"

was held under the auspices of IUPAC from 16-19 July 2001 at the Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, in Prague. More than 100 participants from 19 countries took part in this scientific event.

The proceedings comprised 8 main and 20 special lectures of prestigious experts and 74 poster contributions. Particular attention was paid to the following topics: conductive polymer membranes, polymer electrolyte membranes for fuel cells, gas separation membranes, membrane hybrid systems, and polymer membranes for separation of biological mixtures. The quality and wide scope of the presented results is convincing evidence that developments in this attractive research area continue at a great rate.

 [www.iupac.org/publications/macro/2002/188\\_preface.html](http://www.iupac.org/publications/macro/2002/188_preface.html)

## Green Chemistry Education

P. Tundo and T. Patti (eds.)  
INCA, 2001  
(ISBN 88-88214-00-5)

This book is the result of the joint IUPAC/OECD (Organisation for Economic Co-operation and Development) Workshop on Green Chemistry Education held in Venice in September 2001. The first section of the book deals with the following five topics:

- existing government and industry programs (R&D, awards, information, tools, etc.) useful for incorporating green chemistry into the education systems
- existing green chemistry educational materials, tools, initiatives, and sources
- educational areas that address green chemistry education
- elaboration and carrying out the green chemistry educational programs/projects with new educational materials/tools
- commitments and recommendations necessary to carry out green chemistry educational programs

The second section is a comprehensive listing of available green chemistry education resources, organized by categories such as literature, journal articles specific to green chemistry education, lecture courses (not degree courses), Web-based materials, software-based tools, public awareness materials, exchange programs, generic funding resources, industrial



*The "Floating Tree" by F. Tundo is the illustration that appears on the book cover of Green Chemistry Education.*

resources, and national and international competitions that promote green chemistry.

The third section is devoted to a survey and its results. It gives an overview of the needs and the expectations of the worldwide organizations present at the workshop and operating in the field of green chemistry education.

The report is free to download from [helios.unive.it/inca/pubblicazioni.htm](http://helios.unive.it/inca/pubblicazioni.htm). Printed copies are available upon request.

 [www.iupac.org/publications/books/author/tundo2.html](http://www.iupac.org/publications/books/author/tundo2.html)



### Trace Elements in Food

Barbara Szteke (editor and symposium chair)

*Food Additives and Contaminants*, 2002, Vol. 19, No. 10, 905-1002

Some trace elements are known to be essential to life, but of course, even these elements can have toxic effects depending on the chemical form, dose, route of absorption, and a host of other factors. Other trace elements, especially heavy metals, are well known as potentially "toxic" elements. Diseases caused by improper nutrition, including the consumption of food contaminated by trace elements, constitute serious problems in today's world.

This volume of *Food Additives and Contaminants* includes papers presented at the 1st IUPAC International Symposium on Trace Elements in Food that took place in Warsaw, Poland, on 9–11 October 2000. (See conference report, May 2001 *CI*, Vol. 23, No. 3, p. 84) The symposium, which attracted some 128 participants from 27 countries, was initiated by the IUPAC Food Chemistry Commission and co-organized by the Polish Academy of Sciences, the Warsaw University of Technology, the Polish Food

Technologist's Society, and the Institute of Agriculture and Food Biotechnology.

The conference program included 25 oral presentations, supplemented by 56 posters. This volume includes papers covering the following subjects:

- sources and translocation of trace elements in the trophic chain
- the occurrence and function of trace elements in food and the related international legislative aspects
- the interaction of trace elements with other food components-toxicological and nutritional aspects
- the significance of element speciation in food and its implication for human health
- advances in methods for analyzing trace elements in different food matrices
- the quality assurance and reference materials for their analysis
- measurement in food from a metrology viewpoint
- the question of traceability in food measurements



[www.tandf.co.uk/journals/titles/0265203x.html](http://www.tandf.co.uk/journals/titles/0265203x.html)

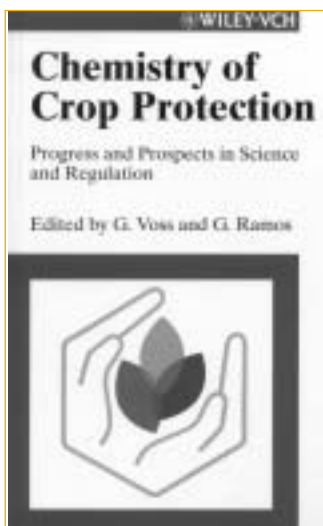
### Chemistry of Crop Protection: Progress and Prospects in Science and Regulation

G nther Voss and Gerardo Ramos (editors)

Wiley-VCH, Weinheim, 2003.

(ISBN: 3-527-30540-8)

The ever-increasing demands for environmental and consumer protection are a continuous challenge for research, development, and regulation of crop protection chemicals. This book contains 30 invited lectures presented at the 10th IUPAC International Congress on the Chemistry of Crop Protection, held 4–9 August 2002 in Basel, Switzerland. These edited contributions take the form of reviews and presentations of original research results. They



cover fundamental aspects of biology, chemistry, biochemistry and molecular biology of disease, weed and insect control agents, economic issues, aspects in production, formulation and application, and recent regulatory developments in environmental and consumer protection. This book should prove invaluable for industrial and academic research libraries in support of their R&D departments.

The congress, held every four years, attracted the participation of approximately 1300 scientists from more than 50 countries. It was locally organized by the Swiss Society of Chemical Industries and Syngenta under IUPAC auspices.

The technical program was focused on the chemistry, biochemistry, and molecular biology of insect, weed, and disease control, and also included strong emphases on crop protection product environmental fate, residue chemistry, consumer safety, and regulation. The latest advances in research and regulation of crop protection chemistry were highlighted via more than 600 posters and also through a series of plenary lectures and interactive workshops.



[www.wiley-vch.de](http://www.wiley-vch.de)

### Women in Physics

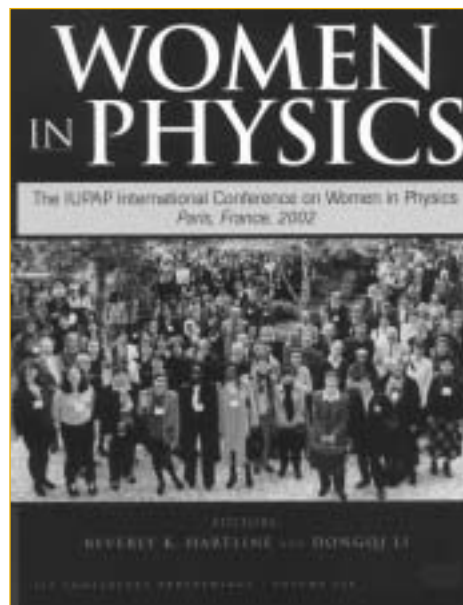
Beverly K. Hartline and Dongqi Li (editors)  
*AIP Conference Proceedings*, Volume 628, Melville,  
NY, 2002.  
(ISBN 0-7354-0074-1)

It takes women in some countries about 10 years longer than their male colleagues to advance to the rank of professor. Societal expectations and educational opportunities present barriers in many countries to girls and women with talent for and interest in physics. To develop strategies to improve this situation, the first International Conference on Women in Physics brought together more than 300 physicists—about 15% of them men—from 65 countries for three days of energizing and inspirational presentations, discussion sessions, and informal interactions. Organized by a working group of the International Union of Pure and Applied Physics (IUPAP), the conference was held at UNESCO headquarters in Paris from 7 to 9 March 2002.

The IUPAP Working Group on Women in Physics, established in 1999, was charged to understand and to develop strategies for increasing women's participation in and impact on the field. It is worth noting that the conference brought together physicists from about 50% more countries than are represented in IUPAP.

The proceedings make it possible for the conference to have impact far beyond the participants. Readers will find in this volume the welcoming remarks, survey report, invited presentations, ideas and strategies from the discussions, resolutions, recommendations, and wonderfully diverse contributions from the participating countries.

Under the leadership of Chairperson Marcia Barbosa (Brazil), the Working Group initiated an international survey of women in physics and organized the conference, inviting teams of physicists from many countries to attend. Each team was asked to develop a brief report and a poster on the situation of women in physics in its country to share at the conference. Attendees heard the results of the survey and received its preliminary written report. Ten distinguished speakers—at least one from every major geographic region—each provided insights into her own experiences and described the situations, barriers, and actions related to women in physics in her country.



Participants were welcomed by Philippe Busquin, Commissioner for Research of the European Union; Walter Erdelen, Assistant Director-General for Natural Sciences at UNESCO; and Burton Richter, President of IUPAP. Discussions focused on issues and strategies related to six important topics for increasing women's involvement in physics: attracting girls into physics, launching a successful physics career, getting women into physics leadership, improving the institutional climate, learning from regional differences, and balancing family and career.

At its final session, the conference unanimously adopted eight resolutions directed at schools, universities, research institutes, industries, scientific societies, national governments, granting agencies, and IUPAP. These resolutions were presented and endorsed at the 2002 IUPAP General Assembly in Berlin. In addition, numerous recommendations were compiled that feature specific actions or interventions, many of which have been proven successful in one or more countries.

The proceedings are available for free at <[proceedings.aip.org/proceedings/confproceed/628.jsp](http://proceedings.aip.org/proceedings/confproceed/628.jsp)>. More details on the conference can be found at the Web site below under a link to the International Conference on Women in Physics.

 [www.iupap.org](http://www.iupap.org)

## Bookworm

### The Skeptical Environmentalist— Measuring the Real State of the World

Bjorn Lomborg

Cambridge University Press, 2001.

(ISBN 0521804477)

*reviewed by H. L. Senti*

Some books appear on the market with big media hype. Television talk shows celebrate their authors. But after waiting a few months on a bookstore's shelf for a buyer, most disappear quietly and the paper is collected for recycling. Others appear without fanfare, are sold and read here and there and, through their message, attract more and more readers. Out of a rivulet of readers grows slowly a large stream. One such book is Bjorn Lomborg's *The Skeptical Environmentalist*.

The deeper I became involved with reading Lomborg's book the more I was reminded of his landsman Hans Christian Andersen. In the story "the emperor's clothes," Andersen tells that it is easy to be fooled when under the spell of general opinion, and only the cool unassuming eye may see the truth. Believe it or not, Lomborg shows that the state of the world is getting better not worse. The air is less polluted today, wealth is increasing. Many countries have GDP comparable to Western countries; more food is available and so forth. To some ears this sounds like pure heresy and, indeed, Lomborg has been vehemently attacked from some quarters.

The book deals with the world's environment, health, poverty, pollution, and overcrowding. People who wish to be informed in a rational way, free from ideological filters and preconceptions, will appreciate it. Lomborg shows that the world is in better shape than advertised by doomsayers (You may remember the prediction by the Club of Rome in 1970 that the world would run out of oil by 1992.) To make his point, he presents us with carefully crafted arguments. The writing is lucid and arguments are formulated with great clarity, free of rhetorical adornments. Lomborg is not a wild anti-environmentalist and throughout the text the underlying message shines through that we must use our resources carefully. He subjects alarmist arguments to sober and rigorous treatment with the tools of statistics. Through such treatment despair turns into hope. Bjorn Lomborg, who describes himself as an "old left-wing Greenpeace member, [who] had been for a long time concerned about environmental questions," is today associate professor of Statistics at the University of Aarhus in Denmark.

The book is organized in six parts: The Litany; Human Welfare; Can human prosperity continue? Pollution: does it undercut human prosperity?; Tomorrow's problems; The real state of the world. Under these headings are discussed subjects such as demographics, life expectancy, Thomas Malthus, forests, water, energy, acid rain, allergies, pesticides and cancer, biodiversity, global warming, and others. A rich collection of 173 figures and 9 tables and 153 pages of notes and references support the text of 352 pages.

To give a taste of Lomborg's arguments, consider a figure showing the number and rate of cases of tuberculosis in the United States. On a steeply declining curve over a period of 40 years (1945–1999) is a part where the tendency is reversed, showing 6 years (1985–1991) of increase. A well-known environmentalist used the six-year increase to infer a general increase of disease. In addition, Lomborg points out, that taking absolute figures for a certain period is misleading when considering that the general population increased during the same period. The book is full of arguments of this nature. In a chapter on non-energy resources he refers to the famous bet of USD 10 000 between the environmentalist Paul Ehrlich, who claimed that 10 years later the world would run out of chromium, copper, and other resources, and the economist Julian Simon who was convinced of the opposite. Lomborg does not contest that these metals are nonrenewable, but concludes "that significant scarcities are unlikely, because we continually find new resources and use them more efficiently . . ."

Many predictions concerning the state of the environment are based on assumptions. Such predictions often deflate when scrutinized with statistical tools. Statistics is a difficult subject and one in which even many scientists are not well trained. It is therefore of great general interest when someone who understands this discipline analyzes subjects that in our culture are heavily loaded with mythical preconceptions.

Lastly, Lomborg admonishes us to apply our resources in such a way as to get the greatest beneficial effect. In that, we should be guided by observed facts rather than by intuition or fear—an idea that we can all subscribe to.

Dr. H.-Luzius Senti <h.luzius.senti@bluewin.ch> is a member of the IUPAC Committee on Chemistry and Industry.



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# Internet Connection

## www.ifcc.org

Serving Laboratory Medicine  
Worldwide

by Craig Webster

As discussed in the feature article by Renze Bais (see page 10, the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) is an organization dedicated to the performance and development of high-quality laboratory medicine. IFCC achieves its goals by publishing information and guidelines on education; by defining principles and recommendations for the standardization of analytical procedures; by promoting meetings through congresses, symposia, and workshops; and by encouraging dialogue with clinicians on matters of common interest.

One way it accomplishes these goals is through its versatile Web site <www.ifcc.org>. The site, which is the main portal to the organization's activities, news, and associated conferences, features a number of useful resources:

- an online bookstore at <www.ifcc.org/store> that features IFCC publications, international collaboration publications, proceedings from a variety of conferences, and Spanish language documents
- the IFCC media database, <www.ifcc.org/media/default.asp>, which allows users to download royalty free images of laboratory activities
- the IFCC documents database, <www.ifcc.org/documents/database.asp>, which provides an easy way to search all of the IFCC publications
- *IFCC News*, a bi-monthly newsletter that reports on the organization and its members' activities, the latest version of which can be found at <www.ifcc.org/news/subscribe.htm>

The site also has extensive sections on each functional division of the IFCC: scientific, communications and publications, congress and conference, and education and management.

The Congress and Conference Division section of the site provides an online meetings database at <www.ifcc.org/divisions/CCD/meets/Default.asp>, which enables users to search for meetings relevant to their areas of interest. Users can also advertise their meetings by adding them to this database using the online forms. The most important forthcoming congresses can be found at <www.ifcc.org/products/IFCCAwards/Congresses%202002-2003.html>. This section also includes information and guidelines for organizing conferences.

The Communications and Publications Division publishes the *Journal of the International Federation of Clinical Chemistry and Laboratory Medicine*, which can be found at <www.ejifcc.org>.



Any feedback on the IFCC's work or its Web site is welcome. Contact:

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Via Carlo Farini 81  
20159 Milano, Italy  
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Craig Webster <cwebster@ntlworld.com> is IFCC WWW coordinator; he is based at the Department of Clinical Chemistry of Nottingham City Hospital in Nottingham, UK.

# Conference Call

## Coordination Chemistry

by Franc Meyer, translated from German to English by Katja Heinze

From 21–26 July 2002, **the International Conference on Coordination Chemistry (ICCC)** took place in Heidelberg, Germany. More than 1100 chemists from 57 nations traveled to the scientific metropolis at the Neckar river to report on and discuss the latest progress in coordination chemistry in 223 lectures and 768 poster presentations.

Since 1950, the ICCC, which usually takes place biannually, has been the central meeting of coordination chemists from all over the world. This year, the 35th conference in the series was brought to Germany for the third time—after Hamburg (1976) and Gera (1990). There was overwhelming interest in the conference, but limitations in the size of the venue prevented a much larger number of participants. The up-to-date and attractive conference program was compiled by the organizing committee of Gottfried Huttner, Elisabeth Kaifer and Roland Krämer.

The diversity of modern coordination chemistry today and the evolution of coordination chemistry into a link between different fields of modern chemistry was impressively demonstrated. Whether bioinorganic chemistry, molecular precursors for novel materials, supramolecular chemistry, or homogeneous metal catalysis—coordination units constitute the fundamental building blocks. Accordingly, the excellent plenary lectures covered all the topics of modern coordination chemistry. Itamar Willner (Jerusalem) gave an account on the development of functional nanostructures elaborately composed of coordination units, biopolymers, and surfaces to construct modules of electronic, electrocatalytic, and optoelectronic devices. Dante Gatteschi (Florence) elucidated the strategies for achieving and understanding high magnetic anisotropies in single molecules—anisotropy is the fundamental prerequisite for molecular magnetism and a thorough understanding is necessary for the improvement of magnetic properties and for future application in nanomagnets. The fact that the mechanism of metallocen-catalyzed olefin polymerization can be conceived only if the so-far neglected “non-coordinating”

counter anions are also taken into account, was demonstrated by Hans H. Brintzinger (Konstanz). The awarding of the Wilkinson prize to Achim Müller (Bielefeld) was doubtlessly a highlight, as well as the impressive lecture given by the laureate, in which he showed the controlled construction, transformation, nesting, and combination of giant molecular polyoxometallate balls, disks, and rings with up to 264 metal atoms—coordination chemistry in a novel dimension.

Finally, J. H. Clark (London) entertained the audience with his colorful presentation about analysis of inorganic pigments used in arts. Raman microscopy not only allows the identification pigments for dating and assigning artwork, but also leads to the discovery of art forgeries as shown by several spectacular examples. Other plenary lectures covered the following topics: self-organization of coordination cage compounds and control of chemical reactions in such supramolecular vessels (M. Fujita, Tokyo); structure elucidation of photosystem I with more than 96 cofactors and of the unique  $Mn_4$  cluster in the water oxidizing complex of photosystem II (P. Fromme, Berlin); synthesis and electronic analysis of novel, inverted sandwich compounds of uranium (C. C. Cummins, MA, USA); luminescent materials with variable absorption and emission characteristics synthesized in a rational way using a coordination chemical approach (V. W.-W. Yam, Hong Kong); and complexes of lanthanide ions with expanded and modified porphyrins which have advanced in clinical testing as anticancer drugs (J. L. Sessler, Austin/Texas). These contributions show once more that fundamental research—especially in the interdisciplinary field of coordination chemistry—leads to new insights, beautiful results, and new applications.

The numerous diversified oral presentations were organized in six parallel sessions (Bioinorganic Chemistry, Metals in Medicine, Metals in Catalysis, Werner Type Complexes, Supramolecular Coordination Chemistry, Materials and Nanochemistry) giving many young scientists the opportunity to present their research. The two poster sessions, in which the participants actively and vividly discussed all aspects of coordination chemistry and socialized with each other, constituted an integral part of the conference. The fact that many discussions and conversations lasted far into the night was due to the perfect organ-





ization. The pleasant environment and the special ambience of the conference location contributed considerably to the great success of the ICC35. Heidelberg and modern coordination chemistry at its best!

This report was first published in German in the November 2002 issue of the magazine of the German Chemical Society.

Franc Meyer <franc.meyer@chemie.uni-goettingen.de> is professor at the Georg-August-University Göttingen and Katja Heinze is professor at the University of Heidelberg.

## Chemical Thermodynamics

by Gerhard M. Schneider

The 17th IUPAC Conference on Chemical Thermodynamics (ICCT 2002) was held at Rostock, Germany, from 28 July to 2 August 2002. Conference chairmen were Prof. A. Heintz and Prof. E. Vogel, University of Rostock, Germany. Since the first event in 1969 in Warsaw, Poland, these biennial conferences have gained increasing international interest and reputation. They are now well established and belong to the most important periodical conferences in the field of chemical thermodynamics worldwide.

The conference was a very successful meeting with 594 attendees (including 78 accompanying persons) from 46 countries. The scientific program included the Rossini Lecture, 7 plenary lectures, 3 main lectures, 25 invited lectures, 227 oral contributions, and 273 posters. Invited lectures will appear in *Pure and Applied Chemistry*, with John H. Dymond as conference editor.

In Rostock, the scientific program started with the traditional Rossini Lecture, which was presented by Prof. J. M. Prausnitz, Berkeley, CA, USA, on "Molecular Thermodynamics for Some Applications in Biotechnology" (see page 13).

Seven symposia and four workshops were held concurrent with the Laehnwitz Seminar on Calorimetry. The complete program was accompanied by database demonstrations coordinated by H. V. Kehiaian and W. M. Haynes.

Succeeding the former IUPAC Commission on Thermodynamics, the new International Association on Chemical Thermodynamics (IACT), established at Rostock, will arrange for all future conferences including IUPAC sponsorship. J.-P. Grolier (Clermont-

Ferrand, France) will act as chairman, J. H. Dymond (Glasgow, U.K.) as secretary, and A. R. H. Goodwin (Cambridge, U.K. and Ridgefield, CT, USA) as treasurer. All will serve four-year terms.

The next ICCT will be held in Beijing, China, from 23-27 August 2004.

### Symposia

- Molecular Simulations of Fluids and Statistical Thermodynamics, coordinated by T. Boublik and H. Krienke
- Phase Equilibria, Supercritical Mixtures, and Separation Techniques Including Polymer Systems, coordinated by T. W. de Loos and W. Arlt
- Electrolyte Solutions and Non-Electrolyte Mixtures Including Reactive Chemical Systems, coordinated by T. M. Letcher, E. Wilhelm, and G. Maurer
- Thermodynamic Properties of New and Advanced Materials Including Pharmaceuticals, coordinated by R. D. Weir and S. Stølen
- Organized Solutions, Surface and Colloid Chemistry, coordinated by G. Olofsson and G. H. Findenegg
- Thermochemistry, Calorimetry, and Molecular Energetics, coordinated by A. L. Smith and G. Wolf. This symposium also included the Laehnwitz Seminar on Calorimetry, coordinated by C. Schick.
- Thermodynamics in the Biological Sciences. Theoretical Aspects and Technical Applications, coordinated by R. Goldberg and H.-J. Hinz

### Workshops

- Material and Energy Transport in Dense Membranes, coordinated by J. G. Crespo and R. N. Lichtenthaler
- Thermochemical, Thermodynamic, and Transport Properties of Halogenated Hydrocarbons and Mixtures, coordinated by A. Laesecke and U.K. Deiters,
- Properties of Ionic Liquids and their Application in Chemical Engineering, coordinated by K. N. Marsh and A. Heintz
- Educational Thermodynamics, coordinated by T. M. Letcher

Gerhard M. Schneider is a professor at Ruhr-Universität Bochum, Germany. He was awarded the Rossini Lecture in 1990.

## Where 2B&Y

### Biophysical Complexity

23-25 April 2003, Southampton, UK

This conference will bring together researchers in the life sciences and in the physical sciences to discuss aspects of Biophysics and Biophysical Chemistry that can contribute to a systems, or integrative, approach to biological organization and processes. Topics that are relevant to the meeting include physical architecture and spatio-temporal organization of nuclei, intracellular signaling pathways and cell-cell communication, control and structure of biochemical networks, multi-enzyme complexes, and physical methods for studying molecular and cellular processes.

A number of distinguished and innovative scientists from both the life sciences and the physical sciences will present overviews, suitable for non-specialists, of areas of research that impact integrative biology. In addition, contributed short talks coupled to posters will provide an opportunity for the presentation of more specialized or detailed material. The invited lectures, together with the contributed talks and posters, are intended to stimulate and inform discussion during the extended poster sessions.

The theme of the conference is particularly timely as systems biology initiatives are developing in a number of countries. In the USA, systems biology is a rapidly expanding area of cross-disciplinary research, while in Europe, Germany has announced a systems biology initiative. In the UK, the Biotechnology & Biological Sciences Research Council has identified systems biology as one of its four priority areas for the coming decade.



The relative lack of opportunities for communication between the physical sciences and the life sciences communities poses a significant barrier to the growth of this cross-disciplinary area of science. Physical chemistry is at a particular disadvantage in the current move towards systems biology. This is because much of the immediate emphasis is either on technologies for genomics and proteomics, or on the application of control engineering to biochemical and genetic networks. However, chemists, and in particular physical chemists, will be central to the continued growth of the life sciences in the post-genomic era because of their uniquely broad discipline base, detailed understanding of molecular/macromolecular properties, and their training in quantitative model building. It is one of the objectives of this meeting to encourage delegates to identify areas of collaboration across scientific and national boundaries.

See Calendar on page 34 for contact information.



### Inaugural Conference for the Southern and Eastern Africa Network of Analytical Chemists

7-10 July 2003, Gaborone, Botswana

Since 1999, the analytical chemistry section of the University of Botswana has annually organized two-day international analytical chemistry workshops in the month of February. In the last workshop, held on 25-27 February 2002 and funded by the Swedish Industrial Development Agency, delegates represent-

ing 13 universities from 11 African countries agreed that a pool of African expertise familiar with issues relating to the African continent be established. This led to the formation of the Southern and Eastern Africa Network of Analytical Chemists (SEANAC). The main aims and objectives of SEANAC are as follows:

- to create a database for providing information on human and physical resources in the field of analytical chemistry, particularly those available in the Africa region
- to promote analytical chemistry in the southern and eastern Africa region through collaboration, research, research training, teaching and information sharing

(c) to facilitate inventory, access, operation, maintenance, and repairs of analytical equipment  
(d) to collaborate with local and international organizations with similar aims

The SEANAC inaugural conference aims to provide a platform for African chemists to interact, exchange information, and network among themselves and with international scientists. These goals will be achieved by dedicating two days prior to the conference for workshops in sample handling, chromatographic techniques, data handling methodologies, presentations of scientific results, and mentoring on issues of writing successful research proposals. Experts, including Drs. Ron Majors and Stuart Cram of Agilent Technologies, will offer such workshops. The workshops will target graduate students, academics, chemists, and technicians already working in industry.

With the help of keynote speakers such as Profs. Darmia Barcelo (II QAB CSIC, Spain), Lo Gorton (Univ. of Lund, Sweden), Erno Lindner (Univ. of Memphis,

USA), James Holcombe (Univ. of Texas at Austin, USA), Jorge Torresdey (University of Texas at El Paso, USA), Prof. Luc Nagels (RUCA, Belgium), and Omowunmi Sadik (SUNY-Binghamton, USA), the conference program will seek to demonstrate and facilitate the application of analytical chemistry in the crucial areas of health, food security, and the environment. Plenary lectures will be published in *Pure and Applied Chemistry* and the rest of the papers presented will be published in a special issue of the journal *Talanta* following the normal review process.

After the conference, delegates will have an opportunity to visit the northern part of Botswana which is home to the world's largest inland delta, the Okavango Delta. This is also home to more than 40 000 elephants, and within 70 km of the Victoria Falls.

See Calendar on page 34 for contact information



[www.ub.bw/departments/science/seanac.pdf](http://www.ub.bw/departments/science/seanac.pdf)

## 12th World Congress of Food Science and Technology

16–20 July 2003, Chicago, Illinois, USA

For over 40 years, the World Congress of Food Science and Technology has fostered the international cooperation and exchange of information among scientists, food technologists, and specialists in order to advance current knowledge and technologies in the areas of food processing, manufacturing, preservation, storage and distribution.

The theme for the 2003 congress is "*Feeding the World—Opportunities Without Boundaries.*" Dr. Per Pinstrup-Andersen, 2001 World Food Prize Laureate, will introduce the overall Congress theme in his keynote address entitled "Feeding the World . . . Innovations from Farm to Plate." The technical program for the congress will consist of plenary lectures, discussion sessions related to the plenary lectures, symposia, roundtable



discussions, student symposia, and posters.

Each day of the congress will have a different emphasis related to the overall theme. Thursday will focus on International Issues, Friday on Solutions/Technology Applications, and Saturday on Future Directions. The General Assembly of the International Union of Food Science and Technology will be held on Sunday, 20 July. Each plenary lecture will be followed by at least one discussion session directed to issues addressed by the plenary lecture. Plans are for a panel to lead the discussion, and emphasis will be on participation by those attending.

12th World Congress of Food Science and Technology  
c/o CompuSystems  
P.O. Box 552  
Brookfield, IL 60513-0552, USA  
Tel: +1 708 486 0715  
E-mail: IUFoST@compusystems.com



[www.WorldFoodScience.org/worldcongress](http://www.WorldFoodScience.org/worldcongress)

## Colloquium Spectroscopicum Internationale

7–12 September 2003, Granada, Spain

Since the first event (1949, France), this biennial international conference has successfully established itself as the forum for presentation and discussion of new developments in all branches of analytical spectroscopy. The objective of this 33rd edition of the CSI is to bring together, on a worldwide scale, experts from academia, official centers, and industry to summarize current progress in the different areas of spectroscopy and to stimulate contacts and the exchange of ideas and experiences.

More than 30 internationally recognized scientists from the different fields of spectroscopy have already agreed to deliver plenary and invited lectures in different sessions.

- This CSI will include a number of additional features:
- Hot Topics sessions, covering some of the cutting-edge trends in applied spectroscopy, have been organized by well-known experts.
  - The CSI XXXIII Award of Granada will be awarded to an internationally recognized outstanding scientist with a career of relevance to analytical spectroscopy.
  - A spectroscopic instrument exhibition and vendor sessions are planned.

### Important Dates

30 March 2003—Submission of abstracts

1 May 2003—Notification of acceptance

31 May 2003—Latest registration at reduced fee

See Calendar on page 35 for contact information

 [www.csixxiii.org](http://www.csixxiii.org)

## Pesticides: Harmonization of Data Requirements and Evaluation

13–16 October 2003, Seoul, South Korea

This IUPAC-Korean Society of Pesticide Science Workshop is designed to increase the level of understanding of international approaches for evaluation and regulation of pesticides among government authorities as well as academic and industrial research groups in Korea and surrounding Asian countries. The theme of the workshop is "Harmonization of Data Requirements and Evaluation." Findings and recommendations of several past and ongoing IUPAC proj-

ects will be highlighted. The program of lectures, posters, and discussions will be divided between three main topics: regulatory harmonization, residue chemistry issues and standards, and risk assessment and risk management.

Contact Information:

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100 Jang-Dong, Yuseoung-gu  
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Fax: +82-42-860-7488  
E-mail: yhkim@kriect.re.kr

 [www.iupac.org/projects/2002/2002-046-1-600.html](http://www.iupac.org/projects/2002/2002-046-1-600.html)

## 16th International Conference on Phosphorus Chemistry

4–9 July 2004, Birmingham, England

The ICPC is held every three years, attracting over 500 international delegates from academia and industry. ICPC 16 will be sponsored by Rhodia, the world's leading producer of phosphorus chemicals and technologies. The program will include a diverse range of topics, such as phosphines/phosphites as catalyst ligands, the use of organophosphorus chemicals as Chromate replacements in metal applications and intermediates in drug synthesis and manufacturing. Also featured will be several emerging new applications of phosphorus chemistry, such as in water treatment, dentistry, electronics,

and ionic liquids. Finally, the symposia will take a close look at novel phosphorus chemistry (e.g., Phosphorus-based polymers and novel bis phosphonate chemicals)

Already attracting a number of keynote speakers, such as professor M. Blackburn, University of Sheffield, who will be speaking on his work in bioorganic phosphorus chemistry, the conference looks set to be a success. The conference organizers hope that this event will provide a valuable platform for encouraging more partnering between industry and academia in phosphorus chemistry and raise the profile of phosphorus chemistry both in the industrial and academic sectors.

See Calendar on page 36 for contact information

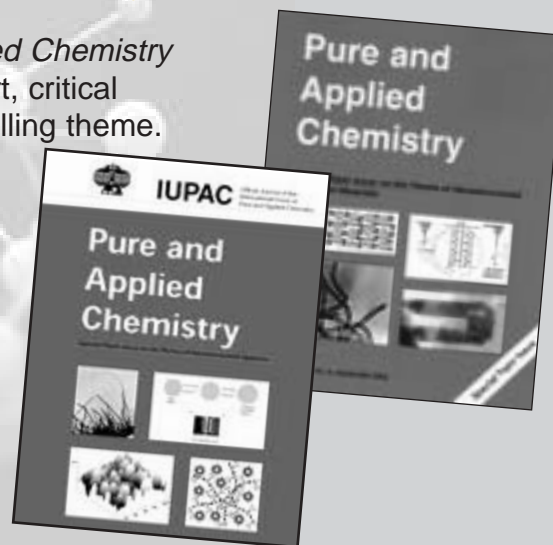
 [www.icpc2004.com](http://www.icpc2004.com)

## Special Topic Issues of *Pure and Applied Chemistry*

The special topic issues of *Pure and Applied Chemistry* are comprised of research papers and short, critical reviews organized around a central, compelling theme. Recent issues have covered the following topics:

- ◆ Science of Sweeteners
- ◆ Electrochemistry and Interfacial Chemistry for the Environment
- ◆ Green Chemistry
- ◆ Nanostructured Systems

Visit [www.iupac.org/publications/pac](http://www.iupac.org/publications/pac) for more information on *Pure and Applied Chemistry* and other special topic issues covering oil spill technologies, environmental oestrogens, and chlorine.



Individual copies are available for USD 50, from: IUPAC Secretariat  
Tel.: +1 919 485 8700  
Fax: +1 919 485 8706  
E-mail: [orderdesk@iupac.org](mailto:orderdesk@iupac.org)



2 0 0 3

**10–12 March 2003 • Heterocyclic Chemistry • Gainesville, Florida, USA**

*4th Florida Heterocyclic Conference*

Prof. Alan R. Katritzky, University of Florida, Dept. of Chemistry, PO Box 117200, Gainesville, FL 32611, USA,  
Tel.: +1 352 392 0554, Fax: +1 352 392 9199, E-mail: [katritzky@chem.ufl.edu](mailto:katritzky@chem.ufl.edu)

**14–17 April 2003 • Polymer Properties • Mpumalanga, South Africa**

*6th Annual UNESCO School & IUPAC Conference on Polymer Properties* (with a special session on Characterization on Polyolefins)

Prof. R.D. Sanderson, UNESCO Associated Centre for Macromolecules and Materials Institute for Polymers Science, University of Stellenbosch, Private Bag X1, Matieland 7602, South Africa, Tel.: +27 21 808 3174, Fax: +27 21 808 4967, E-mail: [rds@sun.ac.za](mailto:rds@sun.ac.za)

**23–25 April 2003 • Biophysical Complexity • Southampton, UK**

Prof. G. Attard, Department of Chemistry, University of Southampton, Southampton SO17 1BJ, UK,  
Tel.: +44 (0)23 8059 3019, Fax: +44 (0)23 8059 3781, E-mail: [complexity@soton.ac.uk](mailto:complexity@soton.ac.uk)

**13–18 May 2003 • 100 Years of Chromatography • Moscow, Russia**

*3rd International Symposium on Separations in BioSciences (SBS '03)*, follow up to the International Symposia Series "Biomedical Applications of Chromatography and Electrophoresis"

Prof. Vadim A. Davankov, Nesmeyanov Institute of Organo-Element Compounds, Vavilov str., 28, 119991, Moscow, Russia, Tel.: +7 095-135-6471, E-mail: [davank@ineos.ac.ru](mailto:davank@ineos.ac.ru)

**19–23 May 2003 • High Temperature Materials • Tokyo, Japan**

*11th International Conference on High Temperature Materials Chemistry (HTMC XI)*

Prof. Michio Yamawaki, University of Tokyo, Department of Quantum Engineering and Systems Science, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, Japan, Tel.: +81 3 5841 7422, Fax: +81 3 5841 8633, E-mail: [yamawaki@q.t.u-tokyo.ac.jp](mailto:yamawaki@q.t.u-tokyo.ac.jp)

**20–24 May 2003 • Macromolecule Metal Complexes • Moscow, Russia**

*Xth International Symposium on Macromolecule Metal Complexes (MMC-X)*

Prof. Valerii V. Lunin, Department of Chemistry, Moscow State University, Leninskie Gory, Moscow, 119899, Russia, Tel.: +7 095 939 5377, Fax: +7 095 932 8846, E-mail: [kar@petrol.chem.msu.ru](mailto:kar@petrol.chem.msu.ru)

**22–27 June 2003 • Plasma Chemistry • Taormina, Italy**

*16th International Symposium on Plasma Chemistry*

Prof. R. d'Agostino, Department of Chemistry, University of Bari, via Orabona 4, I-70126 Bari, Italy,  
Tel.: +39 080 5442080, Fax: +39 080 5443405, E-mail: [dgrc01ch@chimica.uniba.it](mailto:dgrc01ch@chimica.uniba.it) or [info@ispc16.org](mailto:info@ispc16.org)

**30 June–4 July 2003 • Ionic Polymerization • Boston, Massachusetts, USA**

*International Symposium on Ionic Polymerization*

Prof. R.P. Quirk, Department of Polymer Science, The University of Akron, Akron, OH 44325-3909, USA,  
Tel.: +1 330 972 7510, Fax: +1 330 972 5290, E-mail: [quirk@polymer.uakron.edu](mailto:quirk@polymer.uakron.edu)

**6–10 July 2003 • Organo-Metallic Chemistry • Toronto, Ontario, Canada**

*12th IUPAC International Symposium on Organo-Metallic Chemistry Directed Towards Organic Synthesis (OMCOS-12)*

Prof. Mark Lautens, Department of Chemistry, University of Toronto, Toronto, ON M5S 3H6, Canada,  
Tel.: +1 416 978 6031, E-mail: [mlautens@chem.utoronto.ca](mailto:mlautens@chem.utoronto.ca)

**7–10 July 2003 • Analytical Chemistry • Gaborone, Botswana**

*Inaugural Conference for the Southern and Eastern Africa Network of Analytical Chemists (SEANAC)*

Dr. Nelson Torto, Department of Chemistry, University of Botswana, P/Bag UB 00704 Gaborone, Botswana,  
Tel.: +267 355 2502, Fax: +256 355 2836, E-mail: [seanac@mopipi.ub.bw](mailto:seanac@mopipi.ub.bw)

**7-11 July 2003 • Bioinorganic Chemistry • Santa Maria del Mar, Cuba.**

II Santa Maria Workshop on Chemistry (smwc)—devoted to Bioinorganic Chemistry  
Prof. Roberto Cao, University of Havana, Faculty of Chemistry, Vedado 10400, Havana, Cuba,  
Tel.: +537 879 2145, Fax: +537 873 3502, E-mail: rcaov1946@yahoo.com

**21-24 July 2003 • Spectroscopy of Macromolecular Systems • Prague, Czech Republic**

*22nd Discussion Conference of P.M.M. on Spectroscopy of Partially Ordered Macromolecular Systems*  
Dr. Drahomir Vyprachticky, Institute of Macromolecular Chemistry, Academy of Sciences of the  
Czech Republic, Heyrovského nám. 2, CZ-162 06 Praha 6, Czech Republic, Tel.: +420 2 204 03251,  
Fax: +420 2 353 57981, E-mail: sympo@imc.cas.cz

**9-17 August 2003 • IUPAC 42nd General Assembly • Ottawa, Ontario, Canada**

IUPAC Secretariat, Tel.: +1 919 485 8700, Fax: +1 919 485 8706, E-mail: secretariat@iupac.org  
See Countdown on page 5.

**10-15 August 2003 • IUPAC 39th Congress—Chemistry at the Interfaces • Ottawa, Ontario, Canada**

Conference Management Office, National Research Council Canada, 1200 Montreal Road, Building M-19,  
Ottawa, ON, Canada K1A 0R6, Tel.: +1 613 993 0414, Fax: +1 613 993 7250, E-mail: iupac2003@nrc.ca

**24-29 August 2003 • Solution Chemistry • Debrecen, Hungary**

*28th International Conference on Solution Chemistry (28th ICSC)*  
Prof. Gabor Palinkas, Chemical Research Center, Pusztaszeri út 59, POBox 17, H-1525 Budapest, Hungary,  
Tel.: +36 1 325 9040, Fax: +36 1 325 7554, E-mail: palg@chemres.hu

**7-12 September 2003 • Colloquium Spectroscopicum Internationale • Granada, Spain**

*33rd Colloquium Spectroscopicum Internationale 2003*  
Prof. Alfredo Sanz-Medel, Department of Physical and Analytical Chemistry, University of Oviedo,  
C/Julian Claveria, 8, E-33006 Oviedo, Spain, Tel.: +34 985 103474, Fax: +34 985 103125,  
E-mail: asm@sauron.quimica.uniovi.es

**10-15 September 2003 • Organic Chemistry • Cavtat-Dubrovnik, Croatia**

*13th European Symposium on Organic Chemistry (ESOC-13)*  
Prof. Vitomir Sunjić, Ruder Bosković Institute, Division of Organic Chemistry and Biochemistry, PO Box 180,  
HR-10002 Zagreb, Croatia, Tel: +385 1 4571 300, Fax: +385 1 4571 30, E-mail: esoc13@irb.hr

**21-26 September 2003 • General and Applied Chemistry • Kazan, Tatarstan, Russia**

*XVII Mendeleev Congress on General and Applied Chemistry*  
Prof. Alexander I. Konovalov, A.E. Arbuzov Institute of Organic and Physical Chemistry, Kazan Scientific  
Center of Russian Academy of Sciences, Arbuzov Str., 8, Kazan 420088, Tatarstan, Russia,  
Tel.: +7 (8432) 739 365, Fax: +7 (8432) 752 253, E-mail: arbuzov@iopc.knc.ru

**13-16 October 2003 • Pesticides • Seoul, Korea**

*Pesticides: Harmonization of Data Requirements and Evaluation*  
Prof. Yong-Hwa Kim, Korea Research Institute of Chemical Technology, Toxicology Research Center, P.O. Box  
107, Yusong, Taejeon, 305-600, Korea, Tel: +82-42 860-7490, Fax: +82-42 860-7399, E-mail: yhkim@kriect.re.kr

**15-18 October 2003 • Medicinal Chemistry • Krakow, Poland**

*Polish-Austrian-German-Hungarian-Italian Joint Meeting on Medicinal Chemistry*  
Prof. Zdzisław Chiltonczyk, National Institute of Public Health, Chemska 30/34, PL-00-725 Warsaw,  
Poland, Tel.: +48 22 851 52 29, E-mail: chilton@il.waw.pl

**24-27 November 2003 • Polymers • Bangkok, Thailand**

*The 8th Pacific Polymer Conference*  
Prof. S. Tantayaanon, Chulalongkorn University, Department of Chemistry, Bangkok, 10330, Thailand,  
Tel.: +66 2 218 4968, E-mail: supawan.t@chula.ac.th

## Mark Your Calendar

**2 0 0 4**

**26–31 January 2004 • Biodiversity and Natural Products • Delhi, India**

*International Conference on Biodiversity and Natural Products: Chemistry and Medical Application*  
(combining ICOB-4 and ISCNP-24)

Prof. V.S. Parmar, Department of Chemistry, University of Delhi, Delhi 110 007, India, Tel.: +91 11 2766 6555,  
Fax: +91 11 2766 7206, E-mail: virparmar@yahoo.co.in

**11–15 May 2004 • Mycotoxins and Phycotoxins • Maryland, USA**

*11th International Symposium on Mycotoxins and Phycotoxins (ISMP-11)*

Dr. Douglas Park, Food and Drug Administration, CFSAN, 200 C Street, SW, Washington, DC 20204, USA,  
E-mail: dpark@cfsan.fda.gov

**4–9 July 2004 • Phosphorus Chemistry • Birmingham, England**

*16th International Conference on Phosphorus Chemistry (ICPC 16)*

Prof. Pascal Metivier, Rhodia, R&D for Phosphorous and Performance Derivatives, Oak House, reeds  
Crescent, Watford, WD24 4QP, UK, Tel.: +44 1923 485609, E-mail: pascal.metivier@eu.rhodia.com

**18–23 July 2004 • Polymers and Organic Chemistry • Prague, Czech Republic**

*11th International Conference on Polymers and Organic Chemistry 2004 (POC '04)*

Dr. Karel Jerabek, Institute of Chemical Process Fundamentals, Rozvojova 135  
165 02 Prague 6, Czech Republic, Tel.: +420 220 390 332, Fax: + 420 220 920 661, E-mail: kjer@icpf.cas.cz

**25–29 July 2004 • Solubility Phenomena • Aveiro, Portugal**

*11th International Symposium on Solubility Phenomena, Including Related Equilibrium Processes (11th ISSP)*

Prof. Clara Magalhaes, Department of Chemistry, University of Aveiro, P-3810-193 Aveiro, Portugal,  
Tel.: +351 234 401518, Fax: +351 234 370084, E-mail: mclara@dq.ua.pt

**1–6 August 2004 • Organic Synthesis • Nagoya, Japan**

*15th International Conference on Organic Synthesis (ICOS-15)*

Prof. Minoru Isobe, ICOS15 Secretariat, c/o International Communications Specialists, Inc., Sabo Kaikan-  
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