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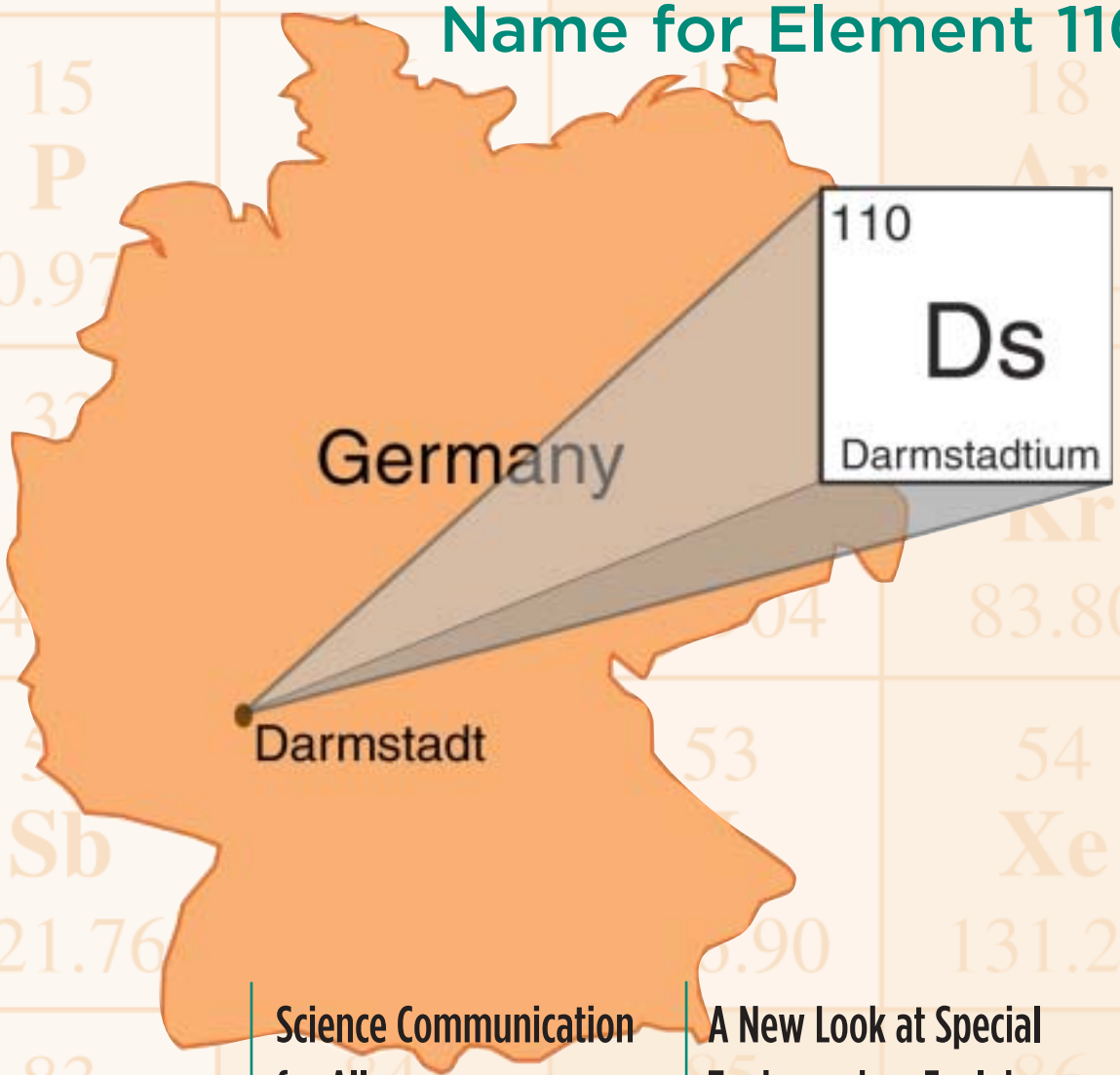
IUPAC Council Approves the Name for Element 110



Science Communication for All

A New Look at Special Topics and an Evolving Policy for *PAC*

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

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From the Editor

This issue of *CI* reminds us that for all the technological breakthroughs and futuristic tools we have at our disposal, people matter most to the advancement of chemistry. And, as a number of articles demonstrate, appreciating and recognizing outstanding individuals in the chemistry community is essential to our growth.

Take a peak at the Wire section (p. 13) to read how IUPAC President Pieter Steyn received the most prestigious award given by the South African Chemical Institute. The award is named for Hendrik van Eck who was given a merit medal in 1969. Naming an award after an eminent scientist is far from original, but it helps amplify the human value of the recognition. Continue to page 14, for a story about three scientists from Africa—B. Abegaz, E. Dagne, and J. Bradley—who have been presented with the Pierre Crabbé Award by the International Organization for Chemical Sciences in Development. Crabbé, the founder of IOCD, was strongly committed to supporting developing countries. Twenty years later, IOCD continues to honor its founder by presenting an award bearing his name—a clear statement that *people matter*.

In his message to the Chemical Society of Japan as it celebrated 125 years (see page 15), IUPAC President Steyn reminded all that "progress in chemistry, or any other science, requires interaction among practitioners, and these interactions are of course individual; groups do not interact, only their individual members interact." Many renowned chemists, including some Nobel Prize winners, were present for the occasion, as well as the Emperor and Empress of Japan. At the event, six eminent chemists were made honorary members of the society.

On page 16, you can read about the symposium recently organized for the celebration of Mostafa El-Sayed's 70th birthday. The success of such an event is no doubt a sign that El-Sayed's influence is widespread and appreciated. Old and young, from far and near, gathered to thank him for his leadership.

Another way to appreciate the influence of people is through interviews or short biographies. A new series starts in this issue of *CI* that will profile personalities or role models in chemistry. This time, the authors Hargittai and Hargittai chose to portray Nelson Leonard (page 7), who was, until not long ago, actively involved in IUPAC.

Finally, and in keeping with our focus on individuals, we thought it would be timely to review the benefits of becoming an IUPAC Affiliate. See page 9, and learn more about the program.

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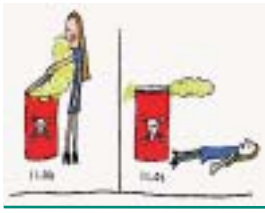


Treasurer's Column

Money Talks

by Christoph F. Buxtorf

The expression "money talks" is generally understood to mean that wealth equals power. In the case of an organization like IUPAC, contributors to the bottom line generally expect to receive something in return.

In recent years I have had several meetings with industry partners, industry associations, and National Adhering Organizations (NAOs). The discussions were mostly about money and they often focused on a perceived mismatch between dues paid by the organization in question and the benefits they receive in return. In 2002, some of our NAOs participated in a Financial Working Group, which addressed issues around National Subscriptions. The ensuing discussion, which often focused on the benefits that members of IUPAC receive, was an "eye opener" for all participants. The meeting made clear that some members and partners of IUPAC do not completely understand or appreciate the benefits that they receive. IUPAC has obviously not fully recognized this issue.

For IUPAC, the dissatisfaction over member benefits is compounded by the fact that funding is becoming more and more difficult to obtain. The worldwide economic downturn has and will continue to have an impact on government and industry funding of international science organizations. Science-driven organizations have the tendency to focus most of their efforts on inside issues and neglect the problems and needs of their partners who operate in an ever-changing world.

IUPAC must recognize that industry functions more and more using its own resources and through powerful trade organizations. In addition, IUPAC has serious competition from new international science organizations, which have become active in "our traditional fields." Therefore, we need to become much more alert in recognizing and anticipating change inside and outside our established area of science. The revised strategic plan is a step in this direction.

Because my professional life has been spent in industry—during which time I have experienced acquisitions, mergers, spin offs, and many strategic plans—I have finally realized that the only stable element in our world today is change. The worldwide economic downturn may be over in some months, but life afterwards will be different. So we will have to revise our goals with time—nothing will remain constant.

A quick look at our financial performance shows little movement on the capital bottom line. However, many changes on the expense and income side have to be carefully controlled. We definitely have to sharpen our pencils.

. . . some members and partners of IUPAC do not completely understand or appreciate the benefits that they receive. IUPAC has obviously not fully recognized this issue.

We certainly need to appreciate the huge amount of work performed by the many volunteers and enthusiasts in our organization—in the divisions and standing committees. Without their dedication and enthusiasm our work could not be financed.

I have further realized that change in a mature organization such as IUPAC is not easy, but we have made good progress with our project-driven approach to solving scientifically relevant problems. We constantly have to reassess our needs. Do potential projects make a difference in our quest to advance worldwide chemistry? And we need to listen to the world outside of IUPAC. We may have to make tough choices in the future and there will be disagreements about priorities, but if we listen to the needs of our partners in the world of chemistry—money will talk.

Christoph F. Buxtorf <ch.buxtorf@dplanet.ch> is the current treasurer of IUPAC. He is retired from Novartis Crop Protection where he was head of the Production and Technology Division and a member of the Executive Committee.

www.iupac.org/standing/fc.html

Science Communication For All

The IUPAC Committee on Chemistry Education is concerned with good practice in chemical education at all levels and the public appreciation of chemistry. The Committee believes that the following article is a helpful contribution to these subjects. The views are the author's own and are not a part of IUPAC's strategy.

by Rainer Glaser

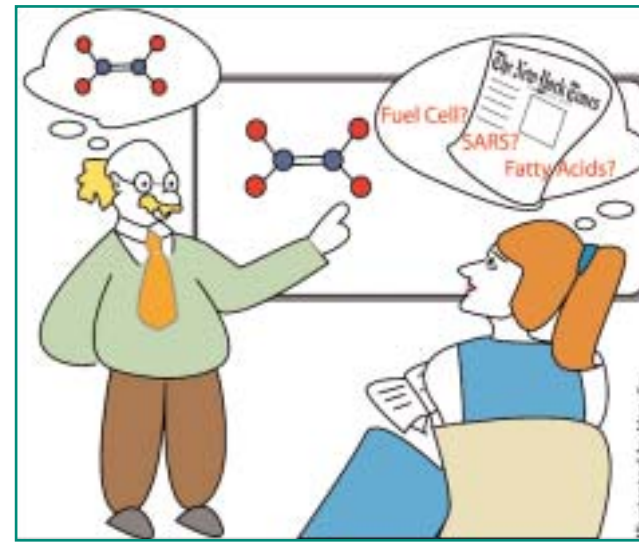
In his Rede Lecture on *The Two Cultures* in 1959, Charles Percy Snow argued that "persons educated with the greatest intensity we know can no longer communicate with each other on the plane of their major intellectual concern" and he concluded that this is "serious for our creative, intellectual, and, above all, our normal lives. It is leading us to interpret the past wrongly, to misjudge the present, and to deny our hopes of the future. It is making it difficult or impossible for us to take good action." In the following decades science progressed with political and public support. Yet, the gap between scientific and humanistic cultures grew larger and societal resistance to real and perceived adverse consequences of science grew from grass-roots activism to well-organized movements. Current concerns about science are exemplified in a conference that The Center for Science in the Public Interest hosts this summer in Washington, D.C., on "Conflicted Science: Corporate Influence on Scientific Research and Science-Based Policy."

Fear of science is not a recent phenomenon and it is normal in the sense that humans approach everything new with some apprehension. What is new, however, is that scientists now also are worried. Martin Rees, the United Kingdom's Royal Astronomer, warns in his book *Our Final Hour* how terror, error, and environmental disaster threaten humankind's future. Such concerns were also expressed at the National Organic Symposium of the American Chemical Society—held in Bloomington, Indiana—that I attended and where I wrote this essay. On 10 June 2003, Peter Schultz of the Scripps Research Institute presented a compelling lecture on the synergistic use of biology and chemistry to make "organisms with expanded genetic codes." The natural amino acids and the DNA bases no longer are enough; organisms can now be "synthesized" containing say 25 customized amino acids or more than the usual 2 base pairs. The first question after the talk was about possible biohazards of this research. Had Rees known about this research, he surely would have added a chapter to his book.

The Need for Engaging the Public in Science Communication

Stewart Brand, cofounder of the Global Business Network, boldly states that "Science is the only News . . . human nature doesn't change much; but science does, and the change accrues, altering the world irreversibly." Science is pervasive in all aspects of modern society and Brand's statement captures the crucial fact that science is growing at an incredible speed. Much of the science important for a person's life in the 21st century will be discovered *after the person has left formal education*. The preparation of students for life-long learning has to become more than a catch phrase, it has to become the highest goal. From this insight derives the mandate to promote science communication in society.

The traditional intelligentsia utterly failed to recognize this essential need and, instead, have propagated postmodernist myths about science, which were so wonderfully exposed by Paul Gross and Norman Levitt in their book *Higher Superstition*. In his book *The Third Culture* John Brockman calls for creating a culture to replace traditional intellectuals and to communicate science and science-based philosophy. Brockman explains in his book and at edge.org that "the third culture consists of those scientists and other thinkers in the empirical world who, through their work and expository writing, are taking the place of



the traditional intellectual in rendering visible the deeper meanings of our lives, redefining who and what we are."

In his editorial "Public Engagement with Science" that appeared in *Science* (14 February 2003), Alan Leshner wrote that "we need to engage the public in a more open and honest, bi-directional dialogue about science, technology, and their products, including not only their benefits but also their limits, perils, and pitfalls. *We need to respect the public's perspective and concerns, even when we do not fully share them* (emphasis ours), and we need to develop a partnership that can respond to them." To do so requires informed engagement by the public and, as Bill Moyers pointed out in his article on "Journalism and Democracy" in *The Nation* (7 May 2001), "the press will possibly play the central role in how scientifically driven transitions are approached and handled in the future." Are the media ready to meet this challenge? Is the public ready to engage in science communication? The second question probably is the critical one since the media respond to public demands. To prepare the public for responsible and bi-directional science communication presents a formidable pedagogical challenge for modern college education. Can it be met?

"the press will possibly play the central role in how scientifically driven transitions are approached and handled in the future."

The State of Undergraduate Science Education

U.S. Census data show that in the last 35 years the number of college age (18–24) Americans remained roughly the same, about 26 million. In the same time, the number of college students in that age group has increased steadily from about 6 million in 1970 to about 9 million in 2000; a 50 percent increase. Data compiled by the Committee for Professional Training of the American Chemical Society show that during the same time period the numbers of M.S. and Ph.D. degrees awarded has remained essentially the same, about 2000 degrees of each type every year. The number of B.S. degrees fluctuated significantly; first climbing quickly from about 8000 in 1970 to over 10 000 in 1980, then declining to less than 8000 in 1990. In the last decade the numbers have gone up again to well above 11 000. Chemistry as a major did not gain from the added numbers of college students, but instead barely held its ground.

Despite the static interest in chemistry, the audience for U.S. college chemistry education has changed dramatically. This is because the share of young people entering college went up from 20 percent in 1970 to about 35 percent today. This is a positive trend and broader access to education for larger segments of society is desirable. The proportion of those required to take chemistry has remained the same and, consequently, chemistry instruction has become even more of a challenge for students *and* for faculty.

One of my recently retired colleagues, after perfecting his style over 35 years of enthusiastic teaching at the University of Missouri (MU), said on various occasions that he "cannot make it any easier any more." A number of factors have contributed to a gradual erosion of educational standards in college science teaching: more students in larger classes, who represent almost twice the percentage of that age group compared to two generations ago; students arriving less prepared from high school; and students exposed to a postmodernist academic climate. Simplified textbooks, algorithmic testing of isolated and simple items, norm-based grading, and the pressure toward grade inflation have camouflaged this process.

There is a dilemma here that needs to be confronted, and soon. The problem cannot be solved via content simplification and traditional pedagogical strategies. Reality is complex rather than simple. There is the chemistry of the combustion of fossil fuels, it is simple and it should be taught rigorously. The complexity of the topic emerges in addressing environmental, economic, and political consequences of societal energy needs. The chemistry of pesticides is slightly more involved and it should be taught in detail. The complexity of this and other health-related topics emerges in discussions about what exposure levels are considered safe for humans and the decision-making process in establishing such levels. The chemistry of sugars, proteins, and fats is somewhat demanding, but it is necessary to understand the complexities of dietetics. If chemists will again dare to teach their science in its full complexity, students will appreciate the efforts and society will take a gigantic step toward science communication for all!

"Chemistry is in the News" Rises to the Challenge

Students need to learn to recognize and to construct these connections. They have to be prepared to evaluate evidence, to appreciate quantitative data, and to understand what they mean. Students need to be able to locate additional data on their own, and then, finally, to make judgments that are sound on many levels: economic, political, philosophical, ethical, and moral. Just 10 years ago, any attempt at implementing systemic change to meet such ambitious goals would have failed for lack of access to media and information and because of problems with course organization, management, and communication. But these barriers no longer exist! Most universities provide phenomenal online access to information for all students and support for course management and communication tools. The combination of this infrastructure with pedagogical strategies that eschew zero-sum outcomes provide extraordinary opportunities. The Chemistry is in the News (CIITN) project at the University of Missouri-Columbia capitalizes on these opportunities and prepares young citizens to comprehend and actively engage in science communication.

The CIITN project involves teaching chemistry to science majors in the context of real-world issues . . .

The CIITN project involves teaching chemistry to science majors in the context of real-world issues and helping students connect real-world social, economic, and political issues to the teaching of chemistry. CIITN activities include the study, creation, and peer review of online projects based on actual news articles from the popular press.

Because the CIITN project relies on online media, a taxonomy was established of news-media-based learning activities to provide a conceptual framework for their description (see table). Ideally, one wants to engage students in a full range of cognitive skills. The various levels of the CIITN project meet this challenge. The implementation and integration of Level-1 to Level-5 of CIITN activities has been accomplished. Students working in small groups were exposed to news items that consisted of an actual recent newspaper article, editorial comment, and questions. The students studied 10 to 12 instructor-created news items, created one news item, and reviewed a number of student-created news items.

These CIITN activities served several purposes. First, the activities made connections between organic chemistry and societal issues and explicit problems therein, and they required students to think critically about these connections. This provided an authentic learning task in which students were actively engaged with the course content. Second, the activities increased communication and interaction among students and between students and the instructor, making a large lecture course seem less impersonal. Third, the activities helped develop skills central to scientific inquiry (data mining) and valuable for students' educational and career goals (e.g., collaboration, communication, and research). Overall, the CIITN activities create a more effective learning environment within a large lecture course and in doing so they promote students' learning of chemistry.

Level-5 involves an external peer-review process in which students taking similar courses at different universities review each other's projects. Aside from the additional management effort, Level-4 and Level-5 activities differ significantly: the evaluators no longer know the evaluees, both have been instructed in different places in slightly different ways, and, most of all, their backgrounds and experiences may be greatly

Taxonomy of News-Media-Based Learning Activities

Level	Activity	Quality Review	Resource	Outcome
1	Read News Article	None	Online news media	Knowledge Comprehension Application Analysis Synthesis Evaluation
2	Read News Items Editorial & questions	Instructor Review	Online Database & Software Tools	
3	Read & Create News Items	Instructor Review		
4	Read & Create & Judge News Items	Internal Peer Review		
5	Read & Create & Judge News Items	External Peer Review		
6	Read & Create & Judge News Items	International Peer Review		

different. Indeed, the students would benefit the most if some of the views held by the different groups were in conflict. External peer review contributes to the development of the students' ability to present their own positions and hear, understand, and respect other points of view. Hence, through Level-5 activities students develop an appreciation of diversity and learn what it means to be a "good citizen." In collaboration with Dr. Susan Schelble, Level-5 CIITN activities involving inter-state collaborations between student groups in Missouri and Colorado were implemented in the winter semesters of 2002 and 2003.

Level-6, which has not been implemented yet, involves border-crossing peer review, a powerful strategy for adding a global dimension to news-media-based learning activities. In this level, peer-review results would be incorporated into the course grade and the students would need to be aware of the international perspective of their projects. The ultimate challenge of this level is the requirement of international collaboration in the preparation of the group projects. Level-6 activities present an opportunity to help students to become "good global citizens." The importance of this opportunity is highlighted in Thomas Friedman's column, published 1 June 2003 in the *New York Times*, in which he explains why so many people are upset with America. His thesis: "America has begun to touch other people's lives more than their own governments do and therefore people all over the world want to be able to vote on American power." Modern Americans need to understand this aspect of being global citizens.

In a letter to Edward Carrington, Thomas Jefferson wrote in 1787, "The basis of our governments being the opinion of the people, the very first object should be to keep that right; and were it left to me to decide whether we should have a government without newspapers or newspapers without a government, I should not hesitate a moment to prefer the latter. *But I should mean that every man should receive those papers and be capable of reading them* (emphasis ours)." The informed citizen is essential to democracy and, today, Jefferson's mandate requires scientific literacy. The political goal therefore has to be science communication for all and the most promising strategy would involve instruction in science communication for students in their early years of undergraduate college education.

CIITN has been funded by the University of Missouri System, the University of Missouri-Columbia, *The New York Times*, and The Camille and Henry Dreyfus Foundation. It is currently funded by the Department of Undergraduate Education of the U.S. National Science Foundation. The CIITN team includes Dr. Rainer Glaser, professor in Chemistry at MU; Dr. James Groccia, director of the Program for Excellence in Teaching at MU; Dr. Susan Schelble, professor in Chemistry at the University of Colorado-Denver; and a group of graduate students—Martin Wu, John Sui, Kathleen Carson, and Brian Hodgen at MU and Eric Lupo at UCD—that brings exceptional interdisciplinary breadth of talents and perspectives to the instructional design and the assessment of the project. This team is dedicated to affecting a systemic change in college science education in the years to come and we are seeking international collaborators with a shared vision and interest to play constructive roles. We invite interested parties to contact us.

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Role Models in Chemistry

This new feature column, edited by Balazs Hargittai and István Hargittai, will cover acclaimed persons in the international chemistry community.

Nelson Leonard

by Balazs Hargittai and István Hargittai

Nelson J. Leonard is a world-renowned organic chemist acclaimed for his skill in organic synthesis. His work has answered questions of fundamental importance to biochemistry and life processes. Leonard invented fluorescent probes and dimensional probes of enzyme-coenzyme binding sites and DNA double-helical cross sections. Leonard has been very active in IUPAC. He served on the Editorial Advisory Board of IUPAC from 1984–1991 and he was President of the Organic Chemistry Division of IUPAC from 1991–1993.

Leonard (born in 1916 in Newark, New Jersey) is the Reynold C. Fuson professor of chemistry emeritus of the University of Illinois, Urbana-Champaign, and faculty associate at the California Institute of Technology in Pasadena. He received his B.S. degree from Lehigh University in 1937; a B.Sc. Degree from the University of Oxford in 1940, following his Rhodes Scholarship there; and his Ph.D. from Columbia University in 1942. Leonard retired from the University of Illinois in 1986 after 44 years. He served as scientific consultant and special investigator, Field Intelligence Technical Agency, U.S. Army and U.S. Department of Commerce, European Theater, during 1945–1946. He was elected a member of the National Academy of Sciences of the USA in 1955. Leonard's distinctions include the Roger Adams Award in Organic Chemistry (1981) and the Arthur C. Cope Scholar Award (1995).

Leonard's father was a salesman in New York and his mother was a housewife. As a child, he had his own chemistry set and in high school he had a good chemistry teacher. Following his career at Urbana-Champaign, he started a second career at Cal Tech where he first went as a Sherman Fairchild Distinguished Scholar in the fall of 1991.

While at Cal Tech he has written review articles based upon some of his earlier discoveries, such as fluorescent derivations of ATP and related compounds. According to Dr. Leonard, it is a good though passive way to keep up with the field. One of his projects, upon invitation from *Tetrahedron,* was to write a "Perspectives" article about his career. He decided to write about what was different about his scientific life. He enjoyed collaboration with other scientists in other places and in other disciplines, so he titled the piece "The 'Chemistry' of Research Collaboration."

When WWII broke out in Europe, Leonard was in Oxford and had to return to the USA. Back in the states, he pursued a Ph.D. at Columbia University, where he worked on alkaloid chemistry. He soon determined that the fun part for him was synthetic organic chemistry and working with natural products. After receiving his Ph.D. in 1942, he headed to the University of Illinois, where his research was concentrated on antimalarials. As a confirmed New Yorker, he thought he would give the Midwest a year and then return to New York. However, he found the Illinois campus a fascinating place, with excellent people at the time: Roger Adams, Carl S. ("Speed") Marvel, Harold Snyder, and Charles C. Price III were his colleagues.

N. Leonard at Höechst, Germany in 1945 (courtesy of N. Leonard).

When the war ended, Dr. Leonard got a temporary job with the U.S. Army overseas as part of an industrial intelligence unit (F.I.A.T.). Stationed in Höechst, Germany, the unit was charged with examining the research publications and research reports of the I. G. Farbenindustrie. Before the war had ended, the intelligence unit had started interviewing directors of research and others from German industry. Eventually, the unit was instructed to obtain details from research reports and manufacturing procedures. They found a number of things that could be applied in American industry. For example, the production of good synthetic rubbers in the USA was aided by information about a particular long-chain mercaptan that had been used in Germany as a modifier in rubber manufacture.

However, they did not see any reports from the infamous I. G. Farben Auschwitz, the Buna and synthetic fuel works. This was not surprising because, according to Joseph Borkin of the Antitrust Division of the Department of Justice, writing in his book *The Crime and Punishment of I. G. Farben*, most of its records were destroyed so that the slave workers in concentration camps could be obscured. When the Cold War started, the idea of taking technical information from Germany ceased to be popular. It was

considered important that German industry should be given an opportunity for revival. The decision was political and military, but this change happened after Dr. Leonard's time in Germany.

Being stationed in Germany allowed Leonard to be reunited with a Dutch woman, Louise Vermey, to whom he had become engaged just before he returned to the USA in 1939. His fiancée spent all of the war years in the Netherlands. They met again in 1945 and married in 1947. In 1987, Louise died of cancer. In 1992, Leonard married Peggy Phelps.

Dr. Leonard's research interests kept shifting during his career. In the first decade, he and his students worked on reductive cyclizations, electrolytic reductions, molecular rearrangements, and the stereochemistry of 1,2-dicarbonyl compounds. After his first sabbatical leave, he worked on medium-ring compounds, discovering some transannular interactions and reactions, and on small charged rings, discovering some ring-enlargement reactions of aziridinium and azetidinium salts.

N. Leonard making a stereochemical point, in 1968 (courtesy of N. Leonard).

During a sabbatical leave in Switzerland in 1960, he started reading biochemistry, but the initiative for research came from one of his students back home, Jim Deyrup, who was working on a natural product, triacanthine, that turned out to have a 3-substituted adenine structure, 3-(Δ^2-isopentenyl) adenine. Most of the adenines known up to that time were substituted at the 9-position. The 3-substitution was a nice surprise and served as a channel into biochemistry through 3-isoadenosine and its mono-, di-, tri-, and cyclic phosphates. For example, 3-iso-ATP turned out to have many coenzyme activities similar to those of natural ATP, adenosine triphosphate.

An isomer of triacanthine, namely N^6-isopentenyladenine, because of its cytokinin activity (plant-cell growth, division, and differentiation) was a channel into plant physiology. Leonard started collaboration with Folke Skoog, professor of Plant Physiology at the University of Wisconsin. They worked together for 20 years and published more than 40 papers together.

Another scientist with whom he had a fruitful collaboration was Professor Gregorio Weber (1916–1997), a great man in fluorescence. Weber went to the University of Illinois from Argentina by way of England, and he excited everybody about fluorescence. In the early 1970s, Leonard's group made fluorescent derivatives of the nucleic acid bases so that they could be detected and would indicate, by fluorescence lifetime, yield, and polarization, and how they were attached to an enzyme or structural protein. The fluorescent derivative of ATP, namely 1,N^6-etheno-ATP, became the most popular in numerous applications thereafter.

Leonard and his group continued with many different research projects based upon fluorescence. They constructed a compound that was a fluorescent dimensional probe of ATP (i.e., linear-benzo-ATP, with the same terminal rings as in ATP but with a central benzene ring built in, thus making it 2.4 angstroms wider than the natural coenzyme). One of Leonard's final projects, conducted with Dr. Balkrishen Bhat, involved a fluorescent, covalently linked cross section of DNA consisting of five fused rings and having the same or very similar geometry to a hydrogen-bonded pair of DNA bases. It just wouldn't come apart. The final goal, which is still unobtained, was to incorporate the covalent cross section to see, in a replicating cell system, whether there was something inserted that prevents the two DNA strands from coming apart, thus inhibiting replication, especially as in fast-growing cancer cells.

Leonard has directed over 120 Ph.D. students and 91 post doctorates and published over 400 papers. His legacy is honored by the annual Nelson J. Leonard Lectureship at the University of Illinois, which is sponsored by his students and former colleagues. Before joining Cal Tech in 1992, Leonard held visiting appointments at the National Institutes of Health in Bethesda, Maryland, and at the University of California, San Diego.

Leonard's heroes include Roger Adams, who was still fully active when he got to Illinois, although he was tied up with the war. In turn, he was to become General Clay's science advisor in Germany and General MacArthur's science advisor in Japan. At Oxford, Leonard appreciated Robert Robinson and at Columbia, Harold Urey was his hero.

Dr. Balazs Hargittai is assistant professor at St. Francis University in Loretto, Pennsylvania; his research interest is in peptide chemistry. Dr. István Hargittai is at Budapest University of Technology and Economics; <www.roadtostockholm.com>.

Why Become an Affiliate?

The IUPAC Affiliate Membership Program was approved by the IUPAC Council in 1983. It was initially designed to get people *interested and involved in IUPAC affairs and activities. Recently, however, the Union has changed and restructured itself in many ways, while the program has continued unchanged, on a self-supporting basis and without much review. Today, there is a growing feeling that the 20-year old program needs a tune-up! A redesigned program should not only take into account, but also complement, the other recently restructured programs, such as the project-driven system, through which* people *can become directly involved in IUPAC projects.*

While some officers are thinking about how to improve the program and its management, and how to better engage the National Adhering Organizations to do their parts, Chemistry International *asked Laura Abernathy* to briefly review the benefits of being an Affiliate Member. If you are reading* CI*, it is most likely that you are already an Affiliate—but keep reading, as the program offers more than you might think!*

by Laura Abernathy

Imagine a beaker without measurement lines. Imagine a chemist in Hungary who communicates research data to a chemist in Australia, yet because the two are using different terminologies, neither can recognize that they are using the same compound. Imagine that a researcher in Canada could provide solutions for an environmental concern in Latin America, but because the problem is never communicated, the issue is never addressed.

IUPAC provides the infrastructure to resolve these problems. The work of IUPAC is a necessity for the continued development of chemistry and chemistry applications, and is almost entirely the result of volunteer efforts. Individuals from different countries unite in working on chemistry-related issues with the goals of developing solutions and initiating standards.

Supporting IUPAC is being a member of a division, participating in project task groups, and attending IUPAC-sponsored conferences; it is also supporting IUPAC through the act of being an Affiliate. By joining the IUPAC Affiliate Membership Program, chemists from around the world show their support for IUPAC and its mission to promote international chemistry research and standards. The support and encouragement of every individual Affiliate is as vital to IUPAC as the work of Divisions and task groups.

IUPAC values every Affiliate throughout the world, from the one in Algeria, to the tens in Ireland, to the hundreds in Germany, to the thousands in the United States.

In appreciation and acknowledgement of the support of its Affiliates, IUPAC provides bimonthly updates on its activities through *Chemistry International*. Affiliates receive discounts on specific IUPAC publications, including *Pure and Applied Chemistry*, and reduced registration fees for most IUPAC-sponsored conferences. The bimonthly IUPAC e-news update provides the latest IUPAC news and Web site updates (join at <www.iupac.org/news/e-news.html>. . . you may unsubscribe at any time).

For chemists in developing countries, IUPAC sponsors a limited number of free Affiliate memberships. For every new paid Affiliate Member, IUPAC can offer a young chemist from a developing country the opportunity to participate within IUPAC as an Affiliate Member.

IUPAC Affiliates are part of an international network of chemists, actively contributing to the development of chemistry and chemistry standards. Today, there are nearly 5000 chemists in the Affiliate Membership Program.

Encourage your colleagues to consider becoming Affiliates to support the IUPAC network. For more information about joining the Affiliate Membership Program visit the IUPAC Web site.

For additional questions or comments, contact Laura Abernathy at <laura@iupac.org>.

***Laura is part of the staff at the IUPAC Secretariat, where she has worked since December 2002 as a communications specialist.**

www.iupac.org/affiliates

A Review of *PAC*

A New Look at Special Topics and an Evolving Policy for *Pure and Applied Chemistry*

In 2002, the Bureau approved the position of a scientific editor of Pure and Applied Chemistry *with the specific mandate to ensure maintenance and improvement of scientific standards, and to seek ways of shaping a publication policy that will enhance the international profile of the journal. After having served as IUPAC Special Topics editor since 1999, Prof. James Bull was appointed as scientific editor.* Chemistry International *asked James Bull to review the Special Topics project and his ideas for the future of* PAC.

by James Bull

Introduction and Overview

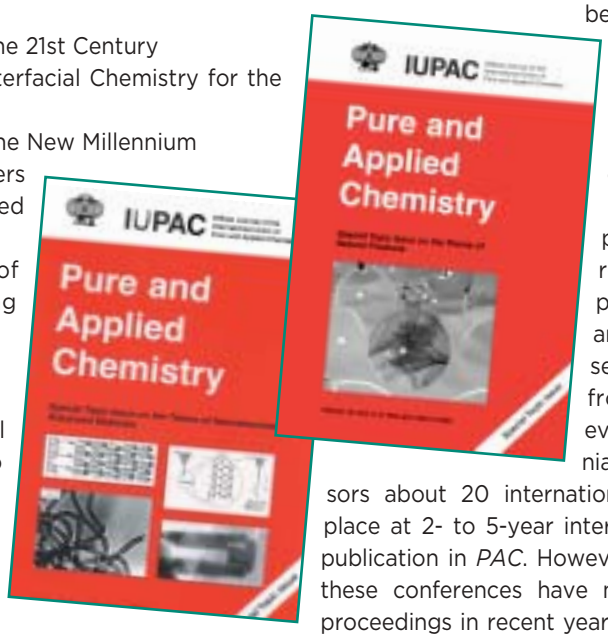
An early initiative to devote occasional issues of *Pure and Applied Chemistry* (*PAC*) to projects outside the scope of normal publication was formalized in 1999 with implementation of the Special Topics project.[1,2] This has resulted in the publication of a number of issues and collections of works on topics that are deemed to be of sufficient public interest to warrant comprehensive coverage. The following topics have received Special Topics coverage in *PAC*:

- Nanostructured Systems
- Green Chemistry
- Quantum Chemistry in the 21st Century
- Electrochemistry and Interfacial Chemistry for the Environment
- Medicinal Chemistry in the New Millennium
- The Science of Sweeteners
- Nanostructured Advanced Materials
- Reviews by winners of 2002 Prize for Young Chemists
- Natural Products

The goal of the Special Topic project was to improve and extend the service that *PAC* offers to readers and authors, and thereby to strengthen IUPAC's ability to serve its membership and the international scientific community. Have we succeeded in meeting these goals? A measure of success would be improved readership and impact, and preliminary findings do suggest that special topic issues enjoy more visibility and citations in other publications.[3]

It follows that the project has also sought to strongly identify IUPAC with the forefront of pure and applied chemistry, in a way that adds value and secures a distinctive publication niche for the journal in the competitive milieu of the international review literature. This implies in turn that candidate themes for special topics need to be rigorously screened in order to ensure that they meet essential criteria of mainstream currency and relevance. In practice, such projects have hitherto relied largely on individual initiatives in deciding what is appropriate and feasible. This approach, however well intentioned and well informed, is not ideal for realization of strategic goals.

At first sight, special topics are merely an extension of the core business of *PAC*, which is to publish outputs of IUPAC-sponsored conferences and of IUPAC reports and recommendations, but it could be argued equally well that the concept points a way forward for an evolving scientific role for IUPAC. Why not consider all publishable outputs as prospective "special topics"? After all, applications for IUPAC sponsorship of international events are subjected to critical evaluation, as is the pre-publication approval of reports and recommendations. The consequent outputs are therefore eligible for special topic characterization, and need only be optimized and amplified, where appropriate, to realign *PAC* more purposefully with the recent and ongoing policy changes within IUPAC.



In fact, the Special Topic projects of recent years reveal much potential for providing in-depth coverage and attracting more representative authorship arising from IUPAC-sponsored events. Apart from the biennial Congress, IUPAC sponsors about 20 international conferences that take place at 2- to 5-year intervals and have a record of publication in *PAC*. However, a significant number of these conferences have not consistently published proceedings in recent years. Furthermore, the partici-

pation levels of main lecturers in publishing their papers varies greatly from a very occasional 100% to less than 50%.

This record can best be characterized as inconsistent, which invites consideration of ways to stimulate more complete participation of lecturers in publication efforts. Those with a sound publication record deserve to enjoy priority as the most appealing candidates for more in-depth publication coverage. In fact, past conference organizers have frequently seized the initiative to extend publication coverage of established events beyond the main lecture program, resulting in more definitive "symposia-in-print." This approach offers a model for more direct and active IUPAC engagement with event organizers in soliciting contributions and in managing peer review, revision, and subsequent publication. Furthermore, it has become evident that many editors and organizers would welcome such intervention. Not only would this diminish their sometimes onerous task of negotiating with prospective authors in the face of competing organizational responsibilities, but could contribute to greater efficiencies and consistency in the overall process.

This new dispensation will also need to accommodate the large number of one-time and occasional IUPAC-sponsored events and the occasional projects that result in publishable compilations. During the past 6 years, more than 20 one-time and occasional events have resulted in *PAC* coverage. This practice will continue in accordance with the criteria stipulated in the new guidelines for IUPAC sponsorship of conferences.

The Way Forward

Two striking features have emerged from the Special Topics initiative. By opening up and actively encouraging the publication option for categories other than plenary lecturers, these projects have enjoyed significant support from other active delegates and particularly from the younger generation of chemists. Secondly, peer evaluation is not only accepted by authors, but appears to be welcomed as a familiar and reassuring prerequisite for publication.

The customary practice of delegating the responsibility for peer evaluation, if any, and scientific editing of manuscripts to designated conference editors has served *PAC* more or less satisfactorily for many years. However, it is subject to the inevitable inconsistencies arising from differing interpretations of appropriate scientific and editorial requirements for publication, and will now be phased out in favor of a more centralized approach designed to achieve a more uniform standard.

Established, biennial events that are regularly published:

Chemical Thermodynamics: 96, 98, 00, 02
IUPAC Conference on Chemical Thermodynamics, ICCT

Natural Products: 96, 98, 00, 02
International Symposium on the Chemistry of Natural Products (ISCNP)

Organometallic Chemistry directed toward Organic Synthesis: 97, 99, 01
International Symposium on Organometallic Chemistry directed toward Organic Synthesis (OMCOS)

Organic Synthesis: 96, 98, 00, 02
International Conference on Organic Synthesis (ICOS)

Photochemistry: 96, 98, 00, 02
IUPAC Symposium on Photochemistry (ISP)

Physical-Organic Chemistry: 96, 98, 00, 02
International Conference on Physical Organic Chemistry (ICPOC)

Plasma Chemistry: 97, 99, 01
International Symposium on Plasma Chemistry (ISPC)

Solubility Phenomena: 96, 98, 00, 02
International Symposium on Solubility Phenomena (ISSP)

Less frequent events or those recently initiated that are regularly published:

Biodiversity: 97, 99, 01
International Conference on Biodiversity (ICOB)

Carotenoids: 96, 99, 02
International Symposium on Carotenoids (ISC)

Advanced Materials: 99, 02
IUPAC Conference on New Directions in Chemistry, Workshop on Nanostructured Materials (WAM)

Sweeteners: 96, 01
International Symposium on Sweeteners (ISS)

Established events that are or have been published (lapses in parentheses):

Bioorganic Chemistry: 97, 00, (02)
International Symposium on Bio-Organic Chemistry (ISBOC)

Carbohydrate: 96, 98, (00), (02)
International Carbohydrate Symposium (ICS)

Chemical Education: (96)**, 98,** (00), (02)
International Conference on Chemical Education (ICCE)

Coordination Chemistry: 96, 97, (98), (00), (02)
International Conference on Coordination Chemistry (ICCC)

Chemistry Conferences in Africa: (95), **98, 01**

High-Temperature Materials Chemistry: 97, 00
International Conference on High Temperature Materials Chemistry (HTMC)

Organometallic Chemistry: (96), (98), **00, 02**
International Conference on Organometallic Chemistry (ICOC)

Solution Chemistry: (97), **99, 01**
International Conference on Solution Chemistry (ICSC)

This new approach merely extends the editorial policy that has been successfully applied in promoting special topics. The practical effect of the change will be to facilitate publication, either by offering support and mediation in those cases where event organizers prefer to retain the responsibility for standards, or by engaging more directly with authors and referees where necessary. In either case, an important feature of the task will be to urge all eligible presenters to contribute manuscripts, thereby ensuring that successful IUPAC-sponsored events are faithfully captured in the publication record. The ensuing guideline attempts to summarize the approach that will be adopted for different classes of material, and suggests a timetable for implementation.

- IUPAC normally has the first option of publishing in *PAC* the papers from lectures delivered at its sponsored conferences. Exceptions include events whose outputs are customarily published in *Macromolecular Symposia*, and those co-sponsored events for which alternative publication arrangements are deemed to be more appropriate.

- The core business of *PAC* comprises conference proceedings of **established series**, and the aim is to publish a representative collection of papers based upon the main lectures of all such events. Other **one-time or occasional conferences and workshops** are similarly eligible but, in practice, the publication option may be waived for those that are deemed to cover very restricted areas of specialization or regional interest. Furthermore, space constraints in PAC may preclude publication of papers from **all** IUPAC-sponsored events, and it may be necessary to give priority to established series.

- All the main lecturers at eligible IUPAC sponsored events are expected to contribute manuscripts to *PAC* for consideration. The scientific editor will work closely with the conference editor in negotiations to improve the response level of prospective authors.

- Conference organizers may propose or be invited to consider extending the scope of publication to include other parts of the scientific program. This option requires prior negotiation about issues such as journal space. If such an event is deemed particularly interesting and topical it may be considered for special topic status.

- Wherever possible, a special topic feature will aim to occupy an entire issue of *PAC*. It is thus necessary to ensure that the topic warrants such exposure. Practical considerations are likely to limit special topic features to no more than three or four annually.

- All manuscripts originating from conference proceedings and submitted for publication in *PAC* will be subject to peer review. The customary practice of accepting manuscripts, subject only to approval by conference organizers, will be discontinued. Instead, the scientific editor will invite the conference editor and authors to nominate referees, who may be consulted as individuals or as a panel constituted by conference organizers. This process, and attendant author-referee mediation and management of manuscript revision, will be conducted by the scientific editor in consultation with conference organizers. The aim is to normalize an independent publication standard for *PAC* and, at the same time, to relieve conference organizers of an additional responsibility whilst retaining access to their specialized expertise during peer review.

- A new Editorial Advisory Board will be appointed to assist IUPAC in shaping and implementing publication policy and practice. Board members will be consulted regularly on publication policy and procedures, and invited to participate in peer review and to offer critical feedback on completed projects and suggestions for new initiatives. The overall responsibility for monitoring the performance and scientific standards of *PAC* remains with the IUPAC Committee for Paper and Electronic Publications, and a mechanism will be formulated to ensure effective communication between this body and the Editorial Advisory Board.

References

[1] Bull, James R, *Chem. Int.*, **22**(4), 105, Sep 2000
[2] Bull, James R, *Chem. Int.*, **24**(5), 7, Nov 2002
[3] Unpublished observations. Detailed analysis of citation data for Special Topics is in progress and will be published in a future issue of *CI*.

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www.iupac.org/publications/pac

Element 110 is Named Darmstadtium

On 16 August 2003 at the 42nd General Assembly in Ottawa, Canada, the IUPAC Council officially approved the name for the element of atomic number 110, to be known as darmstadtium, with symbol Ds. The proposal was recommended by the Inorganic Chemistry Division.

In 2001, a joint IUPAC-IUPAP Working Party (JWP) had confirmed the discovery of element number 110 by the collaboration of Hofmann et al. from the Gesellschaft für Schwerionenforschung mbH (GSI) in Darmstadt, Germany [*Pure Appl. Chem.* **73**, 959–967 (2001)]. The most relevant experiment resulted from the fusion-evaporation using a ^{62}Ni beam on an isotopically enriched ^{208}Pb target, which produced four chains of alpha-emitting nuclides following the presumed formation of ^{269}110 + n. [S. Hofman *et al.*, *Z. Phys.* A350, 277–280 (1995)].

bombardment of lead with nickel ions

$^{208}_{82}Pb + {}^{62}_{28}Ni \longrightarrow {}^{269}110\ (0.17\ ms) + {}^{1}_{0}n$

Since then, the JWP has re-examined the discovery of 110, in view of the obligatory re-assessment brought on by revelations at the Berkeley [Y.A. Lazarev *et al.*, *Phys. Rev.* **C54**, 620–624 (1996)] and GSI laboratories [S. Hofmann *et al.*, *E. Phys. J.* **A14**, 147–157 (2002)] of some apparently fabricated or partially modified decay chains. In its soon to be published report, the JWP re-endorses the confirmed synthesis of element 110 by the team at GSI led by S. Hofmann.

In accordance with IUPAC procedures, the discoverers at the GSI were invited to propose a name and symbol for element 110. They proposed the name **darmstadtium**, with the symbol **Ds**. Thus continues the long-established tradition of naming an element after the place of its discovery.

Hendrik van Eck Medal Awarded to IUPAC President

IUPAC President Pieter Steyn is the latest recipient of the Hendrik van Eck medal, the most prestigious award given by the South African Chemical Institute (SACI). The medal, in honor of former SACI President Hendrik van Eck, is given to an SACI member who has made exceptional contributions to the business or industrial sectors and/or to the community as a whole in South Africa.

Steyn is only the fifth individual to be conferred with this honor in the past 20 years. Past recipients include Dr. A. E. Rupert (1983), Dr. N. Stutterheim (1984), Dr. C. F. Garbers (1991), Dr. F. E. Malherbe (1993), and Dr. R. R. Arndt (1996).

Prof. Steyn is the first person from Africa, and the second from the Southern hemisphere, to serve as IUPAC president. His work within IUPAC also includes acting as division president of both the Applied Chemistry and Chemistry and the Environment Divisions. Steyn is currently director of research at the University of Stellenbosch, with broad management responsibilities for research in the Faculties of Science, Engineering, and Agriculture/Forestry. He was founding director of both the Division of Food Science and Technology and the industry-directed SASOL Centre of Separation Technology at the Potchefstroom University. He was also founding chairman of the project Sediba, which focuses on upgrading science and mathematics teachers in previously disadvantaged schools. Additionally, he was a founding member of the Academy of Science of South Africa. His research has been mainly directed toward improving the quality of food for human and animal consumption, based on the principle that there can be no human dignity under conditions of famine and hunger.

Dr. Van Eck, president of the Institute from 1939–40, was awarded the SACI Gold Medal in 1969. The Gold Medal is an award to recognize merit and achievement specifically within the field of chemistry/chemical technology, whereas the Van Eck medal, established in 1982, is a prestigious award to recognize exceptional achievements within a much broader context. The Van Eck medal is not awarded on a regular basis, but only when a candidate meeting the stringent requirements is nominated. The striking of the first medal occurred in 1983 at the South African Mint in Pretoria.

By tradition, the recipient delivers the Hendrik van Eck Memorial Lecture during a special presentation ceremony held by the Council of the SACI. The presentation ceremony and the lecture were held on 4 June 2003.

More information about the Hendrik van Eck award may be found at <www.saci.co.za>.

IOCD Marks 20th Anniversary by Presenting Pierre Crabbé Award to Three African Scientists

Marking the 20th anniversary of its founding, the International Organization for Chemical Sciences in Development (IOCD) has established this award in honor of its founder, the late Pierre Crabbé, a Belgian scientist who was strongly committed to supporting research among scientists in developing countries. Elkan R. Blout, founding vice president and treasurer of IOCD, expressed his satisfaction that Pierre Crabbé is being recognized by these awards. Pierre Crabbé, said Blout, was an outstanding person and an eminent scientist who had vision and humanity for the developing world—a vision that has been recognized by IOCD's success in supporting Third World scientists.

The Pierre Crabbé Award for 2003 is being presented to three distinguished African scientists for outstanding contributions to the advancement of science and education in developing countries. The three scientists are Berhanu Abegaz (Botswana), Ermias Dagne (Ethiopia), and John Bradley (South Africa), each of whom will receive a cash award and an engraved plaque.

In congratulating these scientists, Jean-Marie Lehn, president of IOCD, stated, "each of these [award winners] is a dedicated scientist, whose work is not only enriching science, but also oriented to the improvement of life in their respective countries."

Berhanu Abegaz

Berhanu Abegaz is a professor of chemistry at the University of Botswana in Gaborone. Abegaz, who received his doctorate in 1973, was a member of the chemistry department at the Addis Ababa University in Ethiopia from 1973 until 1994 when he joined the chemistry department of the University of Botswana. He was elected a member of the Third World Academy of Sciences in 1998. Since 2002, he has been a provisional member of the IUPAC Organic and Biomolecular Chemistry Division. A vigorous researcher in the field of natural products chemistry, Abegaz has published over 100 scientific papers and supervised the research of 17 M.S., 10 Ph.D., and 3 postdoctoral students. Beyond the walls of the university, from 1983 to 1987 he served as the first president of the Chemical Society of Ethiopia, and from 1987 to 1994 was founding editor of the *Bulletin of the Chemical Society of Ethiopia*. From 1984 to 1996 he was a founding member of the Natural Products Research Network for Eastern and Central Africa, and since 1992 he has been the coordinator of the Network for Analytical and Biological Services for Africa. IOCD values his participation since 1990 in its Senior Advisory Council.

Ermias Dagne

Ermias Dagne is a professor of organic chemistry at Addis Ababa University in Ethiopia. His main research is in the area of natural products chemistry, in particular in the isolation and characterization of bioactive compounds. He has published over 75 scientific papers in peer-reviewed local and international journals. He was the founding editor of *SINET: Ethiopian Journal of Science* from 1977–78 and the executive secretary of the Natural Products Research Network for Eastern and Central Africa from 1984–1996. In 1997, Dagne was the recipient of the IFS/Danida Award. Currently, he is leader of the African Laboratory of Natural Products, honorary president of the Horticultural Society of Ethiopia, and chairman of two charity organizations: the Getachew Bolodia Foundation and the Lucy Mother and Child Care.

John Bradley

John Bradley is a professor in the Faculty of Science of the University of the Witwatersrand in South Africa. After obtaining his Ph.D. in chemistry from King's College, London, in 1962, he held a post-doctoral fellowship at Florida State University (USA). In 1964, he returned to South Africa and began teaching and conducting research in physical organic chemistry at the University of the Witwatersrand. In the early 1980s, (when South African higher education was still strongly white oriented), out of concern for educationally disadvantaged students, he spearheaded initiatives at his university to provide such students access to science education. These initiatives included entry-level programs for the disenfranchised and a research program in chemistry education, which has enabled 7 Ph.D.and 14 M.S. students to complete their studies under his leadership. In 1990, Bradley became director of his university's Centre for Research and Development in Mathematics, Science, and Technology Education.

Aware of his leadership in science education, IUPAC asked him to join the IUPAC Committee on Teaching of Chemistry, which he chaired from 1996 to 2001. He served as education officer of the South Africa Chemical Institute from 1992 to 2000 and as its president from 1998 to 2000.

IOCD is a nonprofit organization dedicated to collaborating with chemists in developing countries to bring about advances in chemistry and its application to the needs that face these countries.

www.iocd.org

The Chemical Society of Japan Celebrates 125 Years

The Emperor and Empress of Japan, leaders of several chemical societies, multiple Nobel Prize winners, the IUPAC president, and other renowned chemists joined the Chemical Society of Japan (CSJ) for its 125th anniversary celebration. The ceremony, held on 19 March 2003 at the Rhiga Royal Hotel in Tokyo, was followed by a tea and celebration party.

Ryoji Noyori, 2001 Nobel Laureate and 2002 CSJ president, was the master of ceremonies and gave the opening address. Invited to the ceremony were representatives of international chemical organizations and societies: Prof. Pieter Steyn, IUPAC president; Prof. Barry N. Noller, president of the Federation of Asian Chemical Societies; Prof. Howard Alper, representative of the Canadian Society for Chemistry; Prof. Daoben Zhu, vice president of the Chinese Chemical Society; Prof. François Mathey, president of the Société Française de Chimie; Dr. Rudolf Staudigl, vice president of the Gesellschaft Deutscher Chemiker; Prof. Francesco De Angelis, vice president of the Società Chimica Italiana; Prof Sang-Chul Shim, president of the Korean Chemical Society; Prof. Sir Harold Kroto, president of the Royal Society of Chemistry, UK; Dr. Elsa Reichmanis, president of the American Chemical Society (ACS); and Prof. Shie-Ming Peng, president of the Chemical Society Located in Tapei, Taiwan.

At this occasion, a number of distinguished scientists who have contributed significantly to the society were made honorary members of the CSJ: 1996 ACS President and Columbia University Professor Ronald Breslow, 2000 ACS President and Kansas University Professor Daryle H. Busch, 1996 Nobel Prize recipient and Sussex University Professor Sir Harold Kroto, 1981 Nobel Prize recipient and Cornell University Professor Roald Hoffmann, 1986 Nobel Prize recipient and Taiwan Academia Sinica Professor Yuan T. Lee, and 1987 Nobel Prize recipient and University Louis Pasteur Professor Jean-Marie Lehn.

The ceremony occurred in a friendly but formal atmosphere. The presence of the Emperor and Empress attracted significant attention to the anniversary celebration and their public standing helped to highlight the CSJ and its activities. The event acknowledged the achievements of Japanese chemists, but also the need for continued support and development of chemistry in the country. Chemical research in Japan is subject to financial constraints, often due to the high cost of imported equipment. Concerns about the lack of interest in chemistry within Japan from both industry and young students intensified the need for a high-visibility event. The program included messages from many of the major chemical societies throughout the world, as the Japanese Chemical Society is a solid contributor to the international chemistry community. After the ceremony, invited guests and honorary members were introduced to the Emperor and Empress, and discussions on the recent successes and current challenges facing chemistry in Japan continued with great interest.

The CSJ was founded under the name "Tokyo Chemical Society" in 1878, by a group of about 20 students. In 1912, the Chemical Society of Japan joined IUPAC's predecessor, the International Association of Chemical Societies, which was dissolved to form IUPAC in 1919; Japan then became a member in 1921.

Photo by J. F. Tremblay, C&EN

CSJ President Ryoji Noyori (left) and IUPAC President Pieter S. Steyn

Today, there are more than 50 active members on IUPAC bodies, and approximately 70 fellows.

The CSJ is cosponsoring the Pacifichem Conference with the ACS, the Canadian Society for Chemistry, the Korean Chemical Society, the New Zealand Institute of Chemistry, and the Royal Australian Chemical Institute. The CSJ has been a member of the Federation of Asian Chemical Societies since 1981. It maintains close ties and regularly exchanges information with the Chinese Chemical Society. It also holds close ties to the Italian Chemical Society, French Chemical Society, the German Chemical Society, and the Royal Society of Chemistry.

Photo by J. F. Tremblay, C&EN

Hitoshi Ohtaki (left)—IUPAC Executive Committee member, president of the Pure Science Division of the Science Council of Japan, and professor emeritus at the Tokyo Institute of Technology—conversing with 2000 ACS President D. Busch and 2003 ACS President E. Reichmanis.

On behalf of IUPAC, Prof. Steyn formally presented Prof. Noyori with a message and gifts at the banquet. In his message to the CSJ, Prof. Steyn said that progress in science requires interaction among practitioners. "These interactions are of course individual; groups do not interact, only their individual members interact. However, groups can facilitate the interaction among their members. That is a role of chemical societies, both internally and externally" said Steyn, and "IUPAC is grateful for the cooperation of the CSJ in the furtherance of its mission."

Mostafa El-Sayed Celebrates 70th Birthday

On 23 May 2003, hundreds gathered on the campus of the Georgia Institute of Technology in Atlanta for Mostafa El-Sayed's 70th birthday. The symposium in his honor included a scientific program and a dinner banquet with his whole family present, including all of his children and grandchildren. Among the speakers were Ahmed Zewail (California Institute of Technology), George Whitesides (Harvard University), Edward Solomon (Stanford University), Chad Mirkin (Northwestern University), Fred Hawthorne (UCLA), Ken Eisenthal (Columbia University), Charles Lieber (Harvard University), Sunney Xie (Harvard University), and Michael Kasha (Florida State University). Also present (but still achieving notoriety!) was Stephan Link who recently graduated from the El-Sayed group and who was one of the recipients of the 2001 IUPAC Prize for Young Chemists. CI *asked Stephan to give us his take on the event and his experience at Georgia Tech.*

by Stephan Link

Each of the previously noted speakers not only presented their current research efforts to a packed lecture room, but also shared memories of their interactions with Mostafa El-Sayed, both as the editor in chief of the *Journal of Physical Chemistry* and as a scientific collaborator, mentor, and friend. His dedication to science and teaching was highlighted at the banquet, during which several guests took the opportunity to thank him for sharing his passion of science and for being a great leader both in the physical chemistry community as well as in the chemistry departments at UCLA and Georgia Tech. El-Sayed attributed much of his success to his loving wife Janice and said that "once I don't enjoy teaching [freshman] chemistry anymore, I know it's time to quit." It appears that this is not going to happen any time soon. In fact, El-Sayed is looking forward to his 80th birthday bash!

The symposium included a gathering of El-Sayed's current and former students, postdocs, and visiting scientists for brunch at his house the following day. To his surprise and joy, many of his former coworkers were able to arrange a trip to Atlanta, even if that meant coming from as a far away as South Korea, as was the case for Professor Arnim Henglein who was delighted to interrupt his retirement in the Black Forest in Germany. Indeed, the international character of his research family is something of which El-Sayed has always been very proud. He reminded everyone that "science itself is the same everywhere in the world." His students have come from all over the world and among the countries of his most recent students are such places as Tanzania and Iran.

El-Sayed's involvement in the advancement of science on the international level can be clearly seen from his recent role as organizer of the first IUPAC Workshop on Advanced Materials (WAM) on Nanostructured Systems in July 1999. That first WAM was driven by Prof. Jortner's vision that IUPAC should identify, characterize, and recommend novel research directions by organizing conferences—with the involvement of scientists throughout the world—on New Directions in Chemistry. Jortner was then IUPAC president, and he cochaired the workshop with Prof. El-Sayed. Together, they were able to assemble everyone involved in nanoscience—from Europe, the Americas, and Asia—in one location, Hong Kong, something that is rarely seen.

For someone who is so busy attending meetings, considering departmental policies, and serving as editor in chief for one of the leading journals in physical chemistry and materials science, it seems impossible that El-Sayed would have much time to prepare a lecture or mentor students. But, in fact, one of his most amazing qualities is that he always has time for an undergraduate student seeking help on a homework problem, someone asking for advice or a letter of recommendation, and most of all for his graduate students. He literally stops everything at any point in time to sit down and discuss interesting new research results even if it turns out at the end of the discussion that some results are simply experimental artifacts and require more experiments. "Results are always good news and there is no such thing as bad results!" is one of his favorite ways to cheer up a frustrated and slightly embarrassed graduate student. Being involved and staying on top of all of his students' research projects and having an "open door" at any time, together with his excitement for new results, are among El-Sayed's best qualities as a teacher and mentor. And that will never change, even at 70 years young!

When asked about teaching and the role an advisor plays, Prof. El-Sayed had the following to say:

How important do you think your relationship with your advisor Michael Kasha has been for your career?

He was exciting and he created an atmosphere in his group which encouraged everyone [to] always [talk] with each other about research. We had beer and orbital theory seminars at Mike's house. This time taught me the importance of having peers in your research.

What specific things did you learn from Michael Kasha that you have used in your career?

I always liked Mike's very intuitive perspective on a phenomenon. He taught me the importance of looking for the big picture. (Note: This is a principle El-Sayed has certainly always cherished when figuring out scientific problems and one he has taught to his students.)

How do you see your role as a teacher with respect to students?

I enjoy the role as a teacher and advisor by simply doing science together. You can see how a person becomes independent. You can always tell when they have matured because they start saying "No" in a discussion.

How important is teaching chemistry courses?

No doubt about it, teaching gives you instant feedback that you can build on. When you give a good lecture, the whole day feels satisfying. But also, a bad lecture can make you feel bad and then inspire you to work harder. This way you are learning a tremendous amount yourself. The day I stop being interested in teaching, that is the day I know I have to retire.

In June 2003, Stephan Link moved from Atlanta to Austin, where he joined Paul Barbara 's group.

Reviewing Proposals for NSF Grants

The Division of Chemistry of the U.S. National Science Foundation (NSF) is increasing its pool of reviewers and has asked IUPAC to inform chemists worldwide that well-qualified reviewers for its grant applications are needed.

The NSF, which supports basic research and education in science and engineering, recognizes the importance of international participation in its activities. According to Dr. Arthur B. Ellis, director of the NSF Division of Chemistry Proposals, proposals submitted for funding by U.S. chemists are judged through peer review by respected scientists from around the world who work in academia, government, or industry. Ellis added, "This enables us to obtain broad, global perspectives on the supported research. In addition, reviewers are occasionally asked to serve on panels and to participate in workshops on emerging research and education themes.

The NSF provides support for travel and lodging associated with such activities for all participants. Reviewers benefit from an expanded network of international ties and the opportunity to develop new partnerships related to research, education, and workforce development."

Interested scientists who have not previously served as NSF reviewers should visit the NSF Web site at <www.nsf.gov/mps/divisions/che/news/reviewerinfo.htm>. Ellis pointed out that NSF reserves the right to choose reviewers. While they are unable to assure individuals that they will be asked to review proposals, they do attempt to call upon as many qualified reviewers as possible, and they try to limit the number of requests that they make to any single individual, recognizing the many demands reviewers have on their time.

 **www.nsf.gov/mps/divisions/che/**

Letters from Readers

Regarding H. L. Senti's Review of *The Skeptical Environmentalist*

Chemistry International, March-April 2003, p. 26

by David Shaw

I was surprised and disappointed by the lack of balance and candor in the review by H. L. Senti of *The Skeptical Environmentalist—Measuring the Real State of the World* by B. Lomborg which appeared in the March-April issue of *Chemistry International*. The dominant tone of the review is that Lomborg's work is a fair, accurate, and scholarly analysis. Disagreement with Lomborg's conclusions is dismissed by a single sentence that implies that any criticism is purely political. *CI* readers should know that, in fact, criticism of *The Skeptical Environmentalist* is widespread and substantive. The Danish Committees on Scientific Dishonesty found that the work violates "the standards of good scientific practice" by selectively using data that supports his position and systematically ignoring contrary data. I have no wish to participate in a debate of whether Lomberg is factually correct in his views. However, by ignoring the fact that serious and knowledgeable people take issue with Lomberg's work, Senti uses the same unscientific approach of which Lomberg is accused.

David Shaw <ffdgs@uaf.edu>, University of Alaska at Fairbanks

Reply from H. L. Senti

It is true, as David Shaw writes, that Lomborg's book was criticized. Especially the doomsayer branch of the ecolo-community expressed its anger. I am also aware that Lomborg was accused in a "Danish Committee on Scientific Dishonesty." But what the reader should know as well is that this committee itself was substantively criticized for its procedure; some critics mentioned the word "censure." Danish media, Danish universities, and legal specialists have also criticized this "court." According to them the court did not (could not ?) produce one single example of scientific dishonesty. In their critique of the chapter on the number of extinct species, two scientists did not shy away from the analogy of the number of Jews killed by the Nazis (*Nature* of 8.11.01). I consider that ugly and it shows that some criticisms of the book are colored by anger and politics. This is most unfortunate because Lomborg wanted nothing else but to launch a discussion about priority setting for combating environmental problems which he does not deny.

An afterthought: In contrast to other sciences, many politicians have adopted ecological sciences for their own use. In many countries politicians have made brilliant carriers on ecological platforms. In my view the "marriage" between politics and ecological sciences is most unfortunate. Research, detached and unbiased, becomes difficult. This may be the reason why the discussion of Lomborg's book has become so political and intense.

H. L. Senti <h.luzius.senti@bluewin.ch>

The Project Place

Information about new, current, and complete IUPAC projects and related initiatives.
See also www.iupac.org/projects

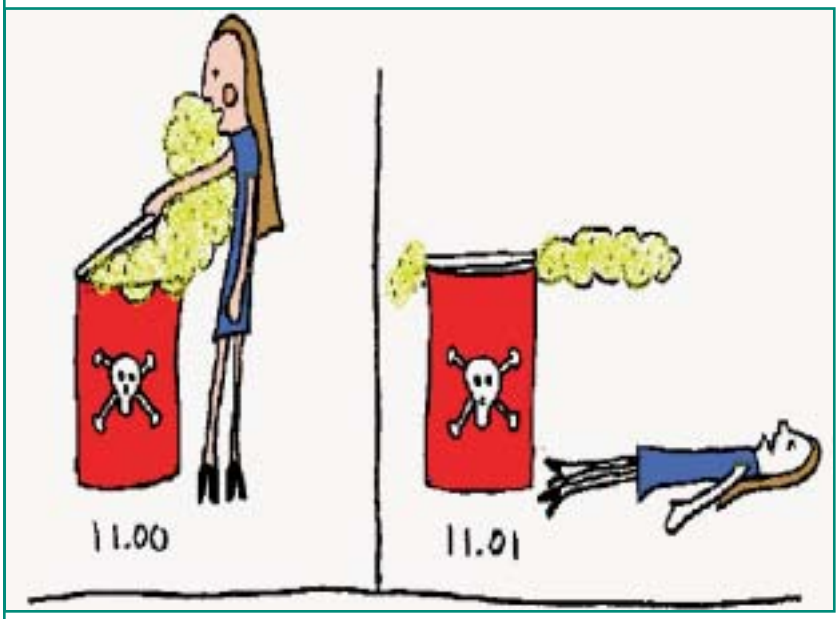
Fundamental Toxicology for Chemists

Chemists are increasingly faced with questions about the safety of substances in common use, ranging from pesticides to fire retardants. In response to this trend, the former IUPAC Committee on the Teaching of Chemistry and the IUPAC Commission on Toxicology initiated a series of projects to introduce toxicology into chemistry courses. The first project was the preparation of a glossary of terms in toxicology, which was followed by the creation of a textbook, *Fundamental Toxicology for Chemists*, and an accompanying curriculum for university-level chemistry courses. A third project was the creation of a series of presentations, which are freely available on the IUPAC Web site. These presentations include self-assessment questions and can be used by motivated students for self-education, although they were originally designed as a resource for teachers of chemistry. The authors hope that teachers will take from this resource whatever is appropriate for their students and make it their own. Teachers are encouraged to supplement the material with examples of local problems in order to make it as relevant as possible.

The field of toxicology continues to develop and a nearly completed IUPAC project will supplement the existing glossary of terms in toxicology with a glossary of terms in toxicokinetics, which is currently available on the IUPAC Web site for comment. *Fundamental Toxicology for Chemists* now needs to be updated and a project to accomplish this has been approved by the IUPAC Project Committee. It is envisioned that the book will be totally revised, including terms from the new glossary and new areas such as toxicogenomics. The editors, John Duffus and Howard Worth, will ensure that it is coordinated with related IUPAC activities and will discuss with the publishers how to facilitate its widest availability.

For more information, contact the Task Group Chairman J. H. Duffus <j.h.duffus@blueyonder.co.uk>.

www.iupac.org/projects/2001/2001-053-2-700.html



From **The Science of Chemical Safety: Essential Toxicology***, by John Duffus and Howard Worth, an online resource of presentations available at <www.iupac.org/publications/cd/essential_toxicology/>.*

Organization of the Chemistry Clearing House

The Committee on Chemistry Education (CCE) has approved a pilot project to organize a Chemistry Clearing House at the Mendeleev University of Chemical Technology for the translation, publication, and dissemination of IUPAC-sourced materials and ideas in chemical education in Russia and the Commonwealth of Independent States (CIS).

Goals of the clearinghouse are to improve the professional skills of teachers in high schools, colleges, and polytechnic schools and to eliminate the present gap between fundamental science and curricula in the teaching of chemistry. New educational technologies and methods as well as foreign scientific magazines such as *Chemistry Review* and *Chemistry International* are not available to teachers, even in high schools, in Russia and CIS. In order to provide teachers with such information, it will be necessary to involve an intermediary organization in Moscow for the dissemination of IUPAC-sourced educational materials and practices approved by CCE. The Chemistry Clearing House could become such an

organization. It would receive educational materials and recommendations from the National Representative in CCE and then would translate, publish, and disseminate them to educational institutions in Russia and CIS via mail, e-mail, the Internet, TV programs, advertisements in Russian newspapers and magazines, and at innovative workshops. The necessary methodological literature would also need to be translated into Russian, prepared, and published.

Another function that could fall under the aegis of this Chemistry Clearing House would be organizing summer programs for young teachers and other audiences regarding these problems of interest to IUPAC. The House of Sciences of Russian Academy of Sciences could be one of the locations for regular workshops.

For more information, contact the Task Group Chairman Prof. Elena S. Gryzlova <ncrc@geokhi.ru>.

www.iupac.org/projects/2001/2001-003-5-050.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*.

Glossary for Toxicokinetics of Chemicals

This glossary contains definitions of 355 terms frequently used in the multidisciplinary field of toxicokinetics. The glossary is compiled primarily for chemists who currently work in toxicology and require knowledge of the expressions used in toxicokinetics, especially in relation to hazard and risk assessment. Medical terms are included because of their frequent occurrence in the toxicological literature and because chemists would not normally be expected to be familiar with them. There are three annexes, one containing a list of abbreviations used in toxicokinetics, one containing a list of abbreviations of international bodies and legislation that are relevant to toxicology and chemical safety, and one giving sources of interest for further reading.

Comments by 30 September 2003

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www.iupac.org/reports/provisional/abstract03/horie_310703.html

Terminology in Soil Sampling

The need to be understood is the first objective of writers and speakers, be it a poet or a scientist. But there is a difference: the scientist must be sure that, within a stated context, the terms used in articles, publications, or in the daily conversation among colleagues, are intended by all in the same precise way, without any possible ambiguity. As already pointed out by IUPAC Recommendation 1990, "Nomenclature for Sampling in Analytical Chemistry," it is unacceptable that scientists are unable to orient themselves in a sampling or analytical process. This can occur if the terms used are not well defined. Moreover, to better appreciate the development of new theories or concepts, progressive updates can be necessary. To this end, on the basis of the existing terminology documents and of the most recent knowledge in the field of soil sampling, an up-dated terminology in sampling (specifically soil sampling) is recommended.

Comments by 30 November 2003

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www.iupac.org/reports/provisional/abstract03/fajgelj_301103.html

The Atomic Weights of the Elements: Review 2000 (IUPAC Technical Report)

J. R. de Laeter, J. K. Böhlke, P. De Bièvre, H. Hidaka, H. S. Peiser, K. J. R. Rosman, and P. D. P. Taylor

Pure and Applied Chemistry
Vol. 75, No. 6, pp. 683–799 (2003)

A consistent set of internationally accepted atomic weights is an essential aim of the scientific community because of the relevance of these values to science, technology, and commerce. Accurate determinations of the atomic weights of certain elements also influence the values of fundamental constants such as the Avogadro, Faraday, and Universal Gas constants.

Various committees or commissions have held responsibility for evaluating and recommending atomic weights of the elements since the late 19th century. This responsibility has resided with IUPAC since it was constituted in 1920. For the last several decades, the Commission on Atomic Weights and Isotopic Abundances (CAWIA) has published updated tables of recommended ("standard") atomic weights and their uncertainties in *PAC* approximately every two years. In *The Atomic Weights of the Elements: Review 2000*, members of CAWIA provide a comprehensive overview of this process in two parts. In the first part, the concept of standard atomic weights, the methods used to determine them, and the basis for making changes are described in a historical review covering the 20th century. In the second part, a detailed summary is provided for each element describing CAWIA decisions that have lead to changes in that element's standard atomic weight and its uncertainty since the 1960s.

Atomic weights were once considered to be constants of nature and were determined by mass-ratio measurements coupled with an understanding of chemical stoichiometry, but they are now based almost exclusively on knowledge of the isotopic composition (derived from isotope-abundance ratio measurements) and the atomic masses of the isotopes of the elements. Technological advances in mass spectrometry and nuclear-reaction energies have permitted measurements of atomic masses with a relative uncertainty of better than 1×10^{-7} and of isotope-abundance ratios of better than 1×10^{-3} in many cases. The improving accuracy and precision of such measurements led to the discovery that many elements exhibit variation in their isotope-abundance ratios (and atomic weights) in different specimens. These variations are caused by a variety of physicochemical and biochemical processes in both natural and industrial systems, place severe constraints on the uncertainties with which some standard atomic weights can be stated, and were once considered a hindrance to the accuracy of chemical measurements. Subsequently, however, these variations have been recognized as powerful tools for investigating important phenomena in physics, chemistry, biology, cosmology, geology, archeology, industry, forensics, and many other fields of study. *The Atomic Weights of the Elements: Review 2000* documents the evolution of two major perspectives in atomic-weight science during the 20th century: increasingly precise measurements of isotope-abundance ratios and atomic weights with ties to the SI (metrology), and discovery and application of isotope-abundance variations in science and technology.

www.iupac.org/publications/pac/2003/7506/7506x0683.html

Critical Review of Analytical Applications of Mössbauer Spectroscopy Illustrated by Mineralogical and Geological Examples (IUPAC Technical Report)

E. Kuzmann, S. Nagy, and A. Vértes

Pure and Applied Chemistry
Vol. 75, No. 6, pp. 801–858 (2003)

A new terminology for Mössbauer pattern analysis has been developed in order to enhance the performance of qualitative analysis by Mössbauer spectroscopy. Mössbauer parameters are considered as a function of a number of externally adjusted experimental parameters at which the spectrum has been recorded. The basis of analytical classification is the microenvironment, which is determined by an assembly of atoms causing the same hyperfine interactions of one particular class of Mössbauer probe atoms. Since Mössbauer spectroscopy measures hyperfine interactions very sensitively, the microenvironment presents itself as a fundamental concept for analytical purposes.

The basic task of any qualitative analysis based on Mössbauer spectroscopy is to identify the individual physical or chemical species from the corresponding patterns present in the spectrum. Ideally, this can be

done if we know the exact correspondence between patterns and species. Such a one-to-one correspondence between species of atoms and individual patterns, however, can be nonexistent for the given set of externally adjusted physical parameters at which the Mössbauer spectrum is recorded. For this reason it is useful to consider all the Mössbauer parameters (P) as a function of a number of externally adjustable physical quantities such as temperature (T), pressure (p), external magnetic field (H), polar angles (Θ,Φ), frequency of high-frequency field (ν), etc.

$$P = P\,(T,p,H,\Theta,\Phi,\nu,\ldots)$$

However, when the whole range of these parameters is considered, we may find points in the space of parameters at which only one pattern is associated with one species and vice versa and thus we can get around the problem of ambiguity.

From the analytical point of view we can introduce useful terminology classifying Mössbauer patterns. A **spontaneous pattern** is a Mössbauer spectrum measured at a given set of externally adjusted parameters (usually under standard conditions). The spontaneous pattern can be either a simple spectrum called an **elementary pattern**, reflecting only a hyperfine interaction at one particular microenvironment or a complex spectrum called **superimposed pattern**, which consists of a number of subspectra. Here we refer to a family of Mössbauer nuclei experiencing the same hyperfine interaction as a **microenvironment**. An **induced pattern** is a Mössbauer spectrum obtained under conditions other than the (mostly standard) ones selected for measuring the spontaneous pattern. In this case, the differences between the induced and spontaneous pattern can provide an important contribution to the analysis. The **transformed pattern** is obtained from the measured Mössbauer spectrum by mathematical transformation (e.g., by Fourier transformation). The magnetic hyperfine field distribution and the quadruple splitting distribution are transformed patterns. The transformed pattern can give a better resolution for the analysis.

Our approach can also contribute to the systematization of Mössbauer data for the identification of individual physical or chemical species from the corresponding patterns present in the spectrum. This new concept can also be generally applied on the field of analytical methods other than Mössbauer spectroscopy, and examples in the field of mineralogy and geology are included.

www.iupac.org/publications/pac/2003/7506/7506x0801.html

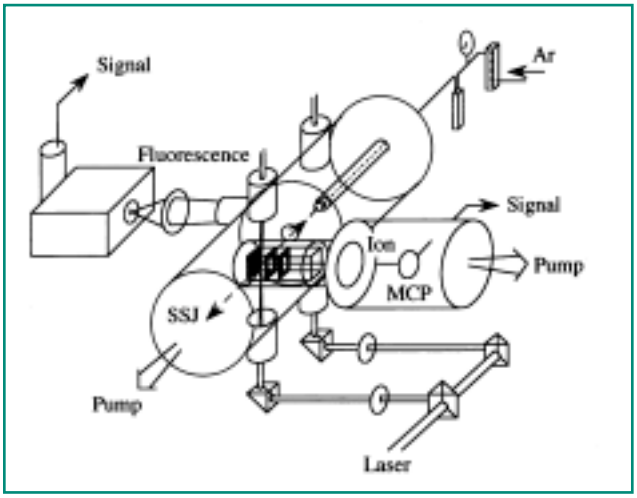
Critical Assessment: Use of Supersonic Jet Spectrometry for Complex Mixture Analysis (IUPAC Technical Report)

T. Imasaka, D. S. Moore, and T. Vo-Dinh

Pure and Applied Chemistry
Vol. 75, No.7, pp. 975–991 (2003)

Numerous chemical substances are present in an authentic sample. Therefore, it is necessary to develop an analytical instrument with high selectivity. However, absorption or excitation/fluorescence spectrometry currently used for analysis of the sample in the condensed phase at room temperature provides a broad band in the spectrum. Therefore, it is difficult to apply it to complex mixture analysis.

When the analyte molecule is cooled to a temperature of a few K using supersonic jet expansion into a vacuum, a molecule exists in the lowest vibrational level of the ground electronic state and is isolated at collision-free conditions. The absorption or excitation/fluorescence spectrum is then greatly simplified when transitions occur from this single vibrational level to a limited number of vibrational levels in the excited electronic state. This method, called supersonic jet spectrometry, is a powerful analytical technique because of its high selectivity, since the chemical species can be accurately identified and



A typical analytical instrument for supersonic jet spectrometry, which allows detection by fluorescence excitation /emission and multiphoton ionization/mass spectrometries simultaneously. Source: T. Imasaka, M. Hozumi, N. Ishibashi. Anal. Chem. *64, 2206 (1992).*

selectively quantified using the sharp spectral features even for large molecules.

Supersonic jet spectrometry has distinct advantages over other low-temperature spectrometries, in that it can be combined with gas phase separation and detection techniques such as chromatography or mass spectrometry. Therefore, this spectrometric technique can be used as a versatile analytical means, not only for basic research on single standard molecules but also for practical trace analysis of chemical species in multicomponent samples (e.g., in biological monitoring or in environmental monitoring).

In this critical assessment basic operational principles and analytical instrumentation are introduced in addition to various applications to polycyclic aromatic hydrocarbons, polymer decomposition products, and chemically hazardous compounds such as dioxins. Several approaches for assignment of the chemical species are also provided, which involve the use of the data of the 0-0 transition for ca. 300 organic compounds and of the theoretical techniques using molecular orbital calculation and fuzzy recognition of the spectral feature.

www.iupac.org/publications/pac/2003/7507/7507x0975.html

Significance of Impurities in the Safety Evaluation of Crop Protection Products

A. Ambrus, D. J. Hamilton, H. A. Kuiper, and K. D. Racke

Pure and Applied Chemistry
Vol. 75, No. 7, pp. 937–973 (2003)

Humans can be exposed to pesticides and their impurities through direct handling, re-entry of treated areas, contact with environmental residues, and dietary intake.

Technical pesticides, in addition to the "pure active ingredient," also may contain complex mixtures of other minor chemical components due to process variables, side reactions, and impurities in starting materials. The impurities may contribute to the toxicity of the pesticide or may alter the physical properties of the product. For some impurities this may lead to the allocation of maximum concentration limits in technical grade products.

The toxicological tests carried out with technical products of typical composition for registration purposes include assessment of toxic potency of the impurities present in the test material. However, the composition of the technical product may vary, particularly with respect to impurities and potentially also the toxicity of the product, depending on the manufacturing process and sources of starting materials. The use of various adjuvants and carrier materials in the preparation of the formulation may also result in marked differences in storage stability of formulations. This is especially of concern in the case of generic pesticides, which may be produced and formulated by many manufacturers under widely varying conditions, with different materials, and under a range of quality control standards.

Because of the confidential nature of the information on impurities in technical pesticides, this report cannot provide comprehensive coverage of the extremely diverse subject. Rather, published examples are given to illustrate possible scenarios and support the conclusions and recommendations made This report is aimed at improving the safety assessment of crop protection products by focusing on the nature and effects of certain impurities. Recommendations are provided to government authorities considering the establishment or revision of their pesticide registration and compliance programs to ensure the safe and efficient use of pesticides. Guidance is also given for the correct assessment of impurities in technical grade and formulated pesticide products based on the technical documentation provided by the manufacturer, appropriate utilization of FAO Specifications of Plant Protection Products, and the toxicological evaluations made by the FAO/WHO Joint Meeting on Pesticide Residues. The importance of regular control of relevant impurities during the manufacturing and formulating processes as well as during storage and handling of marketed products is highlighted.

www.iupac.org/publications/pac/2003/7507/7507x0937.html

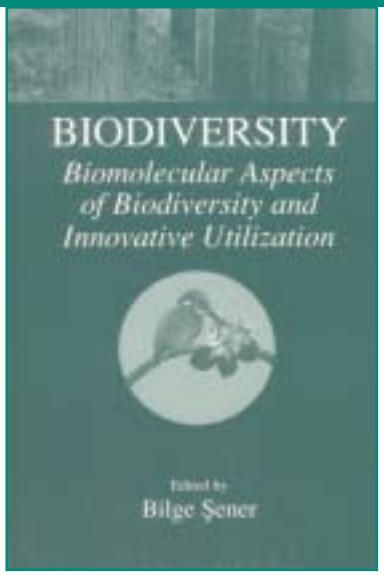
Erratum

The equation that appeared on page 27 of the July issue of *CI* was incorrect because the gamma was not on the main line. Following is the correct version:

$$\mathrm{pH} = -\lg a_{\mathrm{H}} = -\lg (m_{\mathrm{H}}\gamma_{\mathrm{H}}/m^{\circ})$$

Biodiversity: Biomolecular Aspects of Biodiversity and Innovative Utilization

B. Sener (editor)
Kluwer Academic/Plenum Publishers, 2002
ISBN 0-306-47477-8

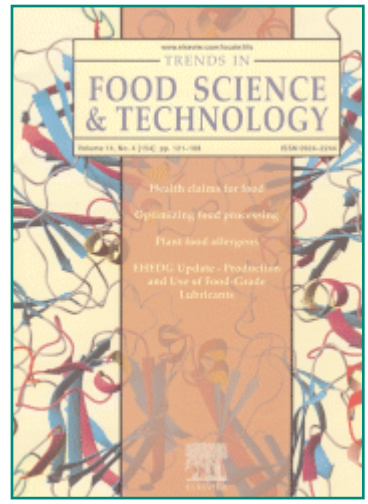


This proceedings of the 3rd IUPAC International Conference on Biodiversity discusses the value of bioresources and the need for their conservation in terms of the biomolecular chemistry of naturally occurring molecular systems. The development of pharmaceutical, agricultural, and industrial products from bioresources can be used to promote incentives for conservation by providing an economic return to sustainable use of those sources. The 54 chapters document the search for new species and how much of life remains to be scientifically identified. The proceedings identifies strategies and methods, and their implications, in protecting biodiversity. In summary, biomolecular aspects of biodiversity and innovative utilization of bioresources are discussed from very diverse points of view, ranging from their botanical, zoological, taxonomic, and genomic expressions to their biomolecular, structural, mechanistic, and functional aspects.

www.iupac.org/publications/books/author/sener.html

Genetically Modified Foods for Human Health and Nutrition: The Scientific Basis for Benefit/Risk Assessment

C. Smith and L. Shukla (editors)
A special issue of *Trends in Food Science and Technology*, Vol. 14, Issues 5–8, pp 169–338, 2003



This special issue reflects the discussions at the final of three ICSU workshops organized to evaluate the scientific basis for the assessment of potential risks and benefits to human health and nutrition of the use of genetically modified food (GMF) crops. International experts in nutrition, medicine, toxicology, molecular biology, microbiology, genetics, economics, and social science, including representatives of the science unions, participated in the workshop, which was held in Manchester, UK, in May 2002. Prior to the meeting, invited experts in relevant fields prepared working papers, which form the basis of the special issue. Each paper was modified and finalized at the workshop in the light of discussions at the workshop. Only publicly available information and research results have been included. This special issue is intended to serve the increasing dialogue between society and science and thus contribute to ongoing discussions about the application of the technological innovations that make GMFs possible.

For more information contact Wendy Hurp <w.hurp@elsevier.com> at Elsevier Food Science and Technology, The Boulevard, Langford Lane, Kidlington, Oxford, OX5 1GB, UK, Fax: +44(0)1865 843960.

www.elsevier.com/locate/inca/601057

Chemical Education International

Material, Life, and Environment

www.iupac.org/publications/cei/

Chemical Education International is a online newsletter published by IUPAC's Committee on Chemistry Education (CCE). Updated regularly, the newsletter is intended for chemistry teachers, professors, and those interested in chemical education.

The newsletter covers:

- reports on activities of CCE and its members, such as projects
- news and reports of events held or supported by IUPAC and related organizations, such as ICCE, CHEMRAWN, etc.
- news and reports on chemical education in member countries of international interest, which are written or communicated by a CCE member
- general articles on chemical education written or recommended by a CCE member as meeting international interest of readers, such as "Interview with Nobel Laureate," facts and figures, opinions, and essays

Recent CEI Articles

An Interview with Nobel Laureate Jean-Marie Lehn

Y. Takeuchi and M. M. Ito
Chemistry Education International, Vol. 4, AN-1, (2003)

For the benefit of those who aspire to a career in chemistry, each issue of *CEI* contains a short interview with a Nobel Laureate in chemistry. The intended readership of these interviews are senior high school students who are at a point in their life where they must make decisions about their future careers, or first year university students in science and technology who must begin to specialize in a chosen field of study.

This interview with Prof J. M. Lehn, conducted by Prof. Y. Takeuchi and Prof. M. M. Ito, was carried out at the Rihga Royal Hotel in Tokyo on 19 March 2003.

www.iupac.org/publications/cei/vol4/0401x0an1.html

Prof. J. M. Lehn (left) being interviewed by Prof. Y. Takeuchi.

CEI Articles Continued

Chemistry is (Almost) Everywhere and in Everything

Arnon Shani
Chemistry Education International, Vol. 4, AN-2 (2003)

Students in high schools seem to lack some of the basic information that enables them to decide what to study in their last two to three years, in particular when dealing with chemistry. Moreover, when they consider further studies at a university, they do not understand the differences between related subjects. They also lack information regarding future employment possibilities and the marketplace.

For many years the author met with students and discussed chemistry as a profession. In this article the author summarizes these talks in a question-and-answer format. The article considers the following questions:

- What are the subjects studied at college that are related to chemistry?
- What are the main topics in chemistry taught at the university level?
- What are the major research fields in chemistry?
- What are the differences between chemistry and closely related subjects, such as chemical engineering, material engineering, pharmacological studies, medicine, and biomedical engineering?
- What is the role of chemistry in other subjects?
- What types of occupations are there for chemists after college, and what level of study is recommended for better employment?

www.iupac.org/publications/cei/vol4/0401x0an2.html

Internet Connection

Providing brief overviews of helpful chemistry resources on the Web
See also www.iupac.org/links

The Science of Spectroscopy

www.scienceofspectroscopy.info

by Stewart L. Mader

Since 1999, Michael A. Rooke and Stewart L. Mader have been co-principal investigators of The Science of Spectroscopy. Funded by NASA through its National Space Grant College and Fellowship Program, the project has focused on rethinking how spectroscopy is taught in undergraduate chemistry courses. The work has resulted in a Web-based curriculum tool that is used at a number of colleges and universities both in the USA and abroad, including the UK, Taiwan, Germany, and Sweden.

The Science of Spectroscopy is featured in several prominent digital libraries, including LearnNet from the Royal Society of Chemistry <www.chemsoc.org/learnnet> and the National Grid for Learning <www.ngfl.gov.uk>. In addition, the journal *Science* recently published a piece on the project in its Vol. 297 issue of 13 September 2002. The Science of Spectroscopy also recently became affiliated with www.science.gov, a U.S. government Web site dedicated to cataloging Web-based resources sponsored by government agencies. It is the only resource highlighting spectroscopy to be selected so far for inclusion on the site.

Over the past year, the site's popularity with the Asian educational community has grown considerably. Approximately 25% of visits now come from Pacific Rim countries by way of The Infochem Project <http://infochem.nctu.edu.tw>, a digital library based at the National Chiao Tung University in Taiwan.

The Science of Spectroscopy guides students through a study of spectroscopy, beginning with an introduction to light and its properties, the electromagnetic spectrum, types of light both visible and invisible to the human eye, and the effects of light interaction with matter. Students continue to a section presenting more advanced elements of spectroscopy theory, such as fluorescence, phosphorescence, and chemiluminescence. The site includes descriptions of common spectroscopic analysis techniques and applications of spectroscopy.

The site also explains five of the most common techniques used to study light interaction with matter. Additionally, students can view three-dimensional molecules in a virtual reality environment, and they can manipulate and closely inspect spectra, the representations of data collected as a result of spectroscopic analysis of molecules.

Another section of the site, provides an introduction to a wide range of spectroscopy applications: consumer devices, including microwaves and sunscreen; medical equipment such as magnetic resonance imaging, CT scanning, and cardiovascular imaging; and space science technology. A special subsection of the site focuses on NASA initiatives and missions in which spectroscopy is a key tool. One such example is the Hubble Space Telescope, which is highlighted for its ability to image distant nebulae, stars, and celestial formations through the use of infrared, ultraviolet, and visible light.

The site's "Web Instruments" section gives students an opportunity to interact with virtual simulations of the instruments used to carry out spectroscopic analyses. Here students can become familiar with the general process of preparing a sample for analysis, collecting a set of data, and manipulating the data to find the desired information about the sample. The newest "Web Instrument" is a scanning electron microscope, which provides the user a range of samples and full capability to adjust brightness, contrast, focus, and magnification.

The entire Web site is designed to tailor the learning experience to the pace, schedule, and interest of the learner. It also allows an instructor to use as much of the content as desired in a course, and content in one section can be used either in conjunction with, or independent of, any other section of the site.

A major new addition to the Web-based material provided by The Science of Spectroscopy is the documentary Seeing the Scientific Light, which is scheduled for release this summer.

CHEMISTRY International September-October 2003 27

Heterocyclic Chemistry

by Lisa McElwee-White

The **4th Annual Florida Heterocyclic Conference** was held at the University of Florida in Gainesville, Florida, USA, from 10–12 March 2003. The conference was organized by Alan Katritzky, Kenan Professor of Chemistry at the University of Florida. Attendees included 168 industrial and academic chemists, along with 40 student participants.

The first day of the conference featured a short course on fundamentals of heterocyclic chemistry. Instructors for the short course were Katritzky and Dan Comins (North Carolina State University). Lectures on subsequent days included a discussion of heterocyclic chemistry in the pharmaceutical industry by Sverker von Unge (AstraZeneca), Mike Butters (AstraZeneca), and Jeff Marcoux (Merck). Catalytic reactions for the preparation of heterocycles were presented by Siegfried Blechert (Technische Universität Berlin), Robert Grubbs (Caltech), and Shu Kobayashi (University of Tokyo). Preparation of a library of bleomycin analogues was the topic of a lecture by Sidney Hecht (University of Virginia). Reductions and anionic chemistry formed a common thread for the talks by Subba Rao (Indian Institute of Science, Bangalore), Norbert De Kimpe (Ghent University), and Miguel Yus (Universidad de Alicante). Other lectures were presented by Jan Bake (Norwegian University of Truncheon) on nitro pyridines and Gordon Gribble (Dartmouth College) on indoles. During breaks, 42 posters from industry and academia were available for viewing.

Drs. Richard Johnston (Eli Lilly and Company) and Eric Scriven (Reilly Industries, Inc.) at the poster session.

Proceeds from the conference are being used to support ARKIVOC (Archive for Organic Chemistry), a free peer-reviewed online journal covering all aspects of organic chemistry. The journal is available at <www.arkat-usa.org>.

Lisa McElwee-White <lmwhite@chem.ufl.edu> is a professor of chemistry at the University of Florida and a titular member of the Organic and Biomolecular Chemistry Division Committee.

Chromatography and Separations in Biosciences

by Vadim A. Davankov

The twenty-first of March 1903 is considered the birthday of chromatography. On that day, at a meeting of the Warsaw Society of Natural Scientists, Mikhail Semenovich Tswett presented a lecture entitled "On the Novel Category of Adsorption Phenomena and their Application to Biochemical Analysis." This was the first public disclosure of the dynamic adsorption analysis, which Tswett soon began to call chromatographic adsorption analysis. Chromatography, which changed science in a most revolutionary way, became the premier separation technique of the 20th century.

To commemorate the 100th anniversary of chromatography, a jubilee international symposium called **100 Years of Chromatography** was held 13–18 May 2003 in Moscow as part of the **3rd International Symposia on Separations in BioSciences**. The symposium was held in the New City Hall of Moscow.

Moscow Mayor Yuri Lushkov started the opening session that consisted of three main lectures. The first lecture, entitled "Mikhail Tswett: The Creator of Chromatography," was given by the chair of the symposium, V. A. Davankov, who briefly described the tragic fate of Mikhail Tswett in the turbulent periods of World War I, two Russian Revolutions, and the Civil War. Davanakov also gave an overview of Tswett's pioneering studies into adsorption phenomena and their evolution into a chromatographic separation technique. Two additional lectures, delivered by Professors Rudolf Kaiser and Heinz Engelhard, reviewed the difficult start of gas and liquid chromatography and the triumphant developments in the field in the last half century.

Corresponding to the jubilee character of the meeting, the scientific program of the next four working days was rather broad and incorporated reports from all types of liquid and gas chromatography, as well as electromigration techniques. It consisted of 30 lectures, 40 oral 20-minute-long presentations, and 300 poster presentations. Reports on chiral separation techniques and achievements in the separation of polymers, viruses, and bacterial cells, and updates from the rapidly expanding area of proteomics and metabolomics were especially well presented. Parallel to the scientific program, an exhibition of 30 international and local manufacturers of chromatographic materials and equipment was held, which included 6 vendor seminars. The total number of participants was about 600, with about 250 foreign guests from 43 different countries represented. Regretfully, Chinese scientists were not able to participate in the Moscow meeting because of restrictions placed on travel by their national authorities in order to prevent the spread of the SARS epidemic.

The social program of the meeting was also intense and included visits to the Kremlin, the famous Bolshoi Opera Theater with its premiere of Verdi's Nabukko, and to the unique Obraszov puppet theater, which presented a special English version of its "Extraordinary Concert." A post-symposium bus tour through a chain of historic Russian cities and monasteries, the so-called Golden Ring, was delightful. There was also a three-day visit to St. Petersburg, which was about to celebrate its 300th anniversary and was exceptionally clean and decorated.

The success of the meeting was only partially due to its impressive scientific program and unusually good weather in Moscow. Much more important was the informal and friendly atmosphere during the meeting; the feeling that the chromatographic world community, as a big international family, gathered to celebrate this outstanding event—the 100th anniversary of Mikhail Tswett's discovery.

Vadim A. Davankov <davank@ineos.ac.ru> of the Russian Academy of Sciences is also a Task Group Member of the Revision of Terminology of Separation Science project within the Analytical Chemistry Division.

http://alpha.ineos.ac.ru/sbs2003/

Polymer Properties

by R. D. Sanderson

The **6th Annual UNESCO School & IUPAC Conference on Polymer Properties** was held in Mpumalanga, South Africa, 14–17 April 2003. The organizing committee was comprised of Prof. R. D. Sanderson (UNESCO Associated Centre for Macromolecules and Materials, Polymer Science Division, University of Stellenbosch, South Africa), Prof. G. Michler (Martin Luther University, Halle-Wittenberg, Germany), Dr. A. J. van Reenen (US, SA), Dr. P. E. Mallon (US, SA) and Aneli Fourie (UNESCO Associated Centre for Macromolecules and Materials, Polymer Science Division, US, SA).

A satisfactory number of delegates (102) participated, representing 23 countries other than South Africa. Delegates from the African continent were from Libya, Gabon, Eritrea, and Uganda. Delegates from non-western nations were from Russia, China, and Iran. Other western countries represented were Germany, The Netherlands, USA, Slovakia, United Kingdom, Budapest, Russia, Switzerland, Spain, France, Belgium, Japan, Czech Republic, Israel, Poland, Australia, Slovak Republic, and Korea. There were 26 students who participated in the conference.

Fifty-seven presentations were made (9 plenary speakers and 48 invited speakers) by experts in their field. All others were accommodated in a lively poster session especially popular for student presentations.

Highlights of the conference included the following lectures: Multifunctional Materials Through Nanostructuring, by G. Wegner (Max Planck Institute for Polymer Research, Germany); Extending the Frontiers of Manipulating Soft Matter Towards Single Molecules, by G. J. Vancso (University of Twente, The Netherlands); Polymer Morphology: A Guide to Macromolecular Self-Organization, by D.C. Bassett (University of Reading, United Kingdom); Crazing and Fracture in Polymers: Micro-Mechanics and Effect of Molecular Variables, by H. H. Kausch (Swiss

Federation Institute of Technology, Switzerland); and Polymer Nanofibres Produced by Electrospinning, by D. Reneker (University of Nebraska-Lincoln, USA).

Twenty-three posters were selected for the two-hour poster session, the standard of which was very good. In conclusion, refreshments donated by the local KWV (Pty) Ltd. and Distell (Pty) Ltd. companies were enjoyed by all.

The overseas plenary and invited speakers stressed the importance to the African economy of postgraduate training in polymer science and chemistry. A virtual teaching encyclopaedia, CD-ROM 2003 (PolymerED), is being created that will consist of all abstracts as well as conference talks. This encyclopaedia, which will provide an excellent tool for teaching and expanding course notes, will be made available to all speakers who attended the conference. It will be available for USD $50 per copy through the UNESCO Associated Centre's Web site. It will be placed in an abridged form on the Web site after approval by each of the contributors.

The 7th Annual UNESCO Introductory Course (3–4 April 2004) and UNESCO/IUPAC Conference (5–8 April 2004) will take place in Stellenbosch, South Africa.

R. D. Sanderson < rds@sun.ac.za > is the National Representative from South Africa on the IUPAC Macromolecular Division Committee and a Task Group Member on the project Establishment of Quantitative Reliability of Electron Spin Resonance Techniques for Polymerization Kinetics.

www.sun.ac.za/unesco/Conferences/Homepage.htm

How to Apply for IUPAC Sponsorship

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

Macromolecule-Metal Complexes

by Edward Karakhanov and Anton Maksimov

The **Xth IUPAC International Symposium on Macromolecule-Metal Complexes (MMC-X)** took place 18–23 May 2003 in a boat that departed from Moscow and travelled along the Volga River. It was held under the auspices of the Russian Academy of Sciences; The Ministry of Industry, Science, and Technologies of the Russian Federation; and the Russian Foundation for Basic Research. It was organized by the Moscow State University's Department of Chemistry.

The first International Symposium on Macromolecule-Metal Complexes (MMC) was organized in 1985 in Beijing. The MMC symposia have been held every two years in locations all over the world (Italy, Germany, China, Netherlands, Japan, USA). The main goal of the meetings is to bring together scientists and technologists (polymer chemists, coordination chemists, biochemists, catalytic chemists, and others) to intensify the dialogue among young scientists, academia, and industry; to encourage newcomers to the field; and to motivate future research.

One hundred twenty participants from 15 countries listened to 6 plenary, 18 invited, and 18 oral lectures. During the symposium 64 posters were also presented.

The scientific program of the 10th symposium was centered around a number of fundamental and applied topics such as fundamental aspects (synthesis, structure, properties), electron and photonic transfer, catalysis and separation processes, supramolecules, dendrimers, molecular recognition, metal ion conductive polymers, and environmental application of MMC. Plenary and invited lecturers covered each topic of the symposium, providing an excellent foundation for discussions and providing ideas for further developments in the field.

Manuscripts from plenary and invited lectures will be published in *Macromolecular Symposia*. The 11th International Symposium on Macromolecule-Metal Complexes will be held in 2005 in Pisa, Italy

Edward Karakhanov <kar@petrol.chem.msu.ru>, chairman of MMC-X, is a head of the Division of Petrochemistry and Organic Catalysis, Department of Chemistry of Moscow State University. Anton Maksimov < max@petrol.chem.msu.ru>, secretary of the symposium, is a senior researcher in the same department.

Medicinal Chemistry

14–17 October 2003, Kyoto, Japan

The **5th International Medicinal Chemistry Symposium** (AIMECS 03), organized by the Asian Federation of Medicinal Chemistry (AFMC), is to be held in Kyoto, Japan from 14-17 October 2003. Previous symposia were held in Tokyo (1995), Seoul (1997), Beijing (1999), and Brisbane (2001).

The scope of medicinal chemistry has undergone noteworthy and scientifically intriguing expansion in recent years. In the 21st century, drug discovery and development are extremely important and challenging themes, and their solution will bring tremendous practical benefits to humanity. Therefore, AIMECS 03 will focus on the design, discovery, and development of new pharmaceuticals and novel bioactive molecules. This symposium will include individual sessions on chemistry for pharmaceuticals, pharmacology for pharmaceuticals, drug metabolism and toxicology, physiology for pharmaceuticals, structural-based drug design, and topics on pharmaceuticals.

See Calendar on page 33 for contact information

www.acplan.jp/aimecs03/

Polymers

24–27 November 2003, Bangkok, Thailand

The Kingdom of Thailand is profoundly proud and honored to host the **8th Pacific Polymer Conference**, 24-27 November 2003, in Bangkok. The conference is hosted by the Polymer Society of Thailand and co-organized by three renowned Thai universities: Chulalongkorn University, Mahidol University, and Rajamangala Institute of Technology.

This conference aims to bring together polymer scientists and technologists, from both academia and industry, to discuss current industry endeavors, discoveries and achievements in polymer science and technology, and to share insights and attractive opportunities from a global perspective. In addition, it is hoped that this conference will help foster networking among colleagues from around the world.

The Pacific Polymer Federation was founded in 1987 to encourage and facilitate interactions between polymer organizations in the Pacific basin. Current members are polymer associations of Australia, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Singapore, Taiwan, Thailand, the United States (ACS and APS), and Vietnam.

See Calendar on page 33 for contact information

www.ppc8.thai.net

Polymer Characterization

6–9 January 2004, Guimarães, Portugal

The **POLYCHAR-12 Forum** will be held in January 2004 at the University of Minho in Guimarães, which is located in the northwest part of Portugal, 50 km northeast of Porto. The previous forum, POLYCHAR-11, attracted participants from more than 40 countries. One of the goals of the forum is to give young scientists opportunities to present results as oral contributions or posters.

The forum will involve characterization, as well as synthesis, processing, manufacturing, and properties, with an emphasis on predictions of service performance. All polymer-based materials, including thermoplastics, thermosets, heterogeneous and molecular composites, hybrids, blends, polymer melts and solutions will be covered. Scientific topics will include: predictive methods, synthesis, nanomaterials and smart materials, mechanical properties and performance, dielectric and electrical properties, surfaces, interfaces and tribology, rheology, solutions and processing, biomaterials and tissue engineering, natural and biodegradable materials and recycling, and characterization and structure-properties relationships.

A course on Polymer Characterization will be held

on Monday, 5 January. The course will include computerized mechanical testing (tension, compression, bending, impact, stress relaxation, dynamic mechanical analysis), tribology (friction, scratch testing), thermophysical characterization (differential scanning calorimetry, thermogravimetric analysis, thermal mechanical analysis, PVT measurements for solids and melts), electrical properties (dielectric spectroscopy, thermally stimulated depolarization), microscopy, chromatography, and interfaces. Lecturers from Germany, Greece, Spain, and the USA will teach the course.

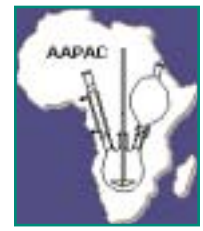
See Calendar on page 34 for contact information

www.unt.edu/POLYCHAR/P12.htm

Chemistry in Africa

2–7 August 2004, Arusha, Tanzania

Every three years, the African Association of Pure and Applied Chemistry holds the **International Chemistry Conference in Africa**. In 2004, the Conference will be hosted at the Arusha International Conference Centre in Tanzania. Arusha, which is exactly half way between Cape Town and Cairo. It is the gateway to Tanzania's famous tourist attractions such as Mount Kilimanjaro, Serengeti, Ngorongoro and Manyara National Parks.



The conference will bring together technical experts, academicians and chemistry professionals involved in all areas of chemistry, from Africa and the world. The conference aims to facilitate the exchange of information and ideas on current research in chemistry and to identify areas of research that are a priority in connection with disease and poverty eradication in Africa.

The conference will cover all areas of chemistry including analytical, physical, inorganic, organic, natural products, environmental, industrial, theoretical, computational, combinatorial, green, and organometallic chemistry, as well as biochemistry and chemical education. Oral and poster presentations are invited.

See Calendar on page 35 for contact information

www.udsm.ac.tz/News_events/9icca.html

Physical Organic Chemistry

15–20 August 2004, Shanghai, China

The **17th International Conference on Physical Organic Chemistry (ICPOC-17)** continues a long and distinguished series of IUPAC-sponsored conferences in this specialty. This conference will offer a forum for researchers to present and discuss results in modern physical organic chemistry. ICPOC-17 will emphasize recent achievements of physical organic chemistry and its interaction with other sciences (e.g., mechanistic ideas and studies as the driving force in synthetic chemistry, physical organic chemistry of organized and living systems, theoretical studies in organic chemistry).

Approximately 300 scientists from around the world are expected to attend this conference.

See Calendar on page 35 for contact information

http://202.127.145.69/wuli.htm

Visas

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

Mark Your Calendar

Upcoming IUPAC-sponsored events
See also www.iupac.org/symposia
for links to specific event Web site

2003

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 Sunjiic, Ruder Boskovic 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

5–8 October 2003 • Multicomponent Materials • Balatonfüred, Hungary
Interfaces and Interphases in Multicomponent Materials
Dr. Béla Pukánszky, Budapest University of Technology and Economics, Department of Plastics and Rubber Technology, P.O. Box 91, H-1521 Budapest, Hungary, Tel.: +36 1463 2015, Fax: +36 1463 3474, E-mail: pukanszky@muatex.mua.bme.hu

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, Yusung, Taejon, 305-600, Korea, Tel: +82-42 860-7490, Fax: +82-42 860-7399, E-mail: yhkim@kitox.re.kr

14–17 October 2003 • Medicinal Chemistry • Kyoto, Japan
5th International Medicinal Chemistry Symposium of the Asian Federation of Medicinal Chemistry (AIMECS 03)
Prof. Yukio Sugiura, Institute for Chemical Research, Kyoto University, Uji, Kyoto 611-0011, Japan, Tel : +81 774 38 3210, Fax: +81 774 32 3038, E-mail: sugiura@scl.kyoto-u.ac.jp

15–18 October 2003 • Medicinal Chemistry • Krakow, Poland
Polish-Austrian-German-Hungarian-Italian Joint Meeting on Medicinal Chemistry
Prof. Zdzislaw Chilmonczyk, National Institute of Public Health, Chemska 30/34, PL-00-725 Warsaw, Poland, Tel.: +48 22 851 52 29, E-mail: chilmon@il.waw.pl

12–14 November 2003 • Bio-Based Polymers • Saitama, Japan
1st International Conference on Bio-based Polymers (ICBP 2003)
Dr. Yoshiharu Doi, Polymer Chemistry Laboratory, RIKEN, 2-1 Hirosawa,Wako-shi, Saitama 351-0198, Japan, Tel.: +81 48 467 9402, Fax: +81 48 462 4667, E-mail: ydoi@postman.riken.go.jp

12–16 November 2003 • XML Data Dictionary and the IUPAC Chemical Identifier • Gaithersburg, Maryland, USA
Dr. Steve Stein, E-mail: steve.stein@nist.gov
<www.iupac.org/projects/2002/2002-022-1-024.html>

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

2004

6–9 January 2004 • Polymer Characterization • Guimaraes, Portugal
12th Annual Polychar World Forum on Advanced Materials (POLYCHAR 12), [a one-day course on polymer characterization is scheduled on 5 Jan 2004]
Prof. Antonio M. Cunha, Department of Polymer Engineering, University of Minho, P-4800-058 Guimaraes, Portugal, Fax: +351 253510339, E-mail: amcunha@dep.uminho.pt

26–31 January 2004 • Biodiversity and Natural Products • Delhi, India
International Conference on Biodiversity and Natural Products: Chemistry and Medical Applications (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

9–10 March 2004 • Heterocyclic Chemistry • Gainesville, Florida, USA
5th Florida Heterocyclic Conference
Prof. Alan R. Katritzky, University of Florida, Dept. of Chemistry, PO Box 117200, Tel.: +1 352 392 0554, Fax: +1 352 392 9199, E-mail: katritzky@chem.ufl.edu

17–21 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

27 June–1 July 2004 • Biomolecular Chemistry • Sheffield, UK
7th International Symposium on Biomolecular Chemistry (ISBOC-7)
Prof. George M. Blackburn, University of Sheffield, Department of Chemistry, Sheffield, S3 7HF, UK, Tel.: +[44] 114 222 9462, Fax: +[44] 114 273 8673, E-mail: g.m.blackburn@sheffield.ac.uk

27 June–2 July 2004 • Coordination and Organometallic Chemistry of Germanium, Tin, and Lead • Santa Fe, New Mexico
XIth International Conference on the Coordination and Organometallic Chemistry of Germanium, Tin, and Lead
Prof. Keith Pannell, Department of Chemistry, University of Texas at El Paso, El Paso, TX 79968-0513, Tel.: +1 915-747-5796, Fax: +1 915-747-5748, E-mail: kpannell@utep.edu

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

4–9 July 2004 • Macromolecules • Paris, France
40th International Symposium on Macromolecules—IUPAC World Polymer Congress (MACRO 2004)
Prof. Jean-Pierre Vairon, Université Pierre et Marie Curie, Laboratoire de Chimie des Polymères, Case 185, 4 Place Jussieu, F-75252 Paris Cédex 05, France, Tel: +33 1 44 27 50 45, Fax: +33 1 44 27 70 89, E-mail: macro04@ccr.jussieu.fr

11–15 July 2004 • Polymer Biomaterials • Prague, Czech Republic
43rd PMM Microsymposium: Polymer Biomaterials: Biomimetic and Bioanalogous Systems
Drahomir Vyprachticky, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Heyrovskeho nam. 2, CZ-162 06 Praha 6, Czech Republic, Tel.: +420 2 204 03332, Fax: +420 2 367 981, E-mail: sympo@imc.cas.cz

17–22 July 2004 • Photochemistry • Granada, Spain
20th IUPAC Symposium on Photochemistry
Prof. Dr. Miguel A. Miranda, Departamento de Química/Instituto de Tecnologia Quimica UPV-CSIC, Universidad Politecnica de Valencia, Avenida de los Naranjos, s/n, E-46022 Valencia, Spain, Tel: + 34 963877807, Fax: + 34 963877809, E-mail: mmiranda@qim.upv.es

Mark Your Calendar

18–21 July 2004 • Chemical Sciences in Changing Times • Belgrade, Yugoslavia
4th International Conference of the Chemical Societies of the South-Eastern European Countries on Chemical Sciences in Changing Times
Prof. Ivanka Popovic, Belgrade University, Faculty of Technology and Metallurgy, Karnegijeva 4, 11000 Belgrade, Yugoslavia, Tel.: +381 11 337 0478, Fax: +381 11 337 0473, E-mail: ivanka@elab.tmf.bg.ac.yu

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-bekkan, 2-7-4 Hirakawa-cho, Chiyoda-ku, Tokyo 102-8646 Japan, Tel: +81-3-3263-6474, Fax: +81-3-3263-7537, E-mail: icos@ics-inc.co.jp

2–7 August 2004 • Chemistry in Africa • Arusha, Tanzania
9th International Chemistry Conference in Africa—Chemistry Towards Disease and Poverty Eradication
Dr. G. S. Mhinzi, University of Dar es Salaam, Chemistry Department, PO Box 35061, Dar es Salaam, Tanzania, Tel./Fax: +255 22 2410038, E-mail: mhinzi@chem.udsm.ac.tz

3–8 August 2004 • Chemical Education • Istanbul, Turkey
18th International Conference on Chemical Education (18th ICCE)
Prof. Dr. Mustafa L. Berkem, Chairman, Marmara University, Ataturk Faculty of Education, TR- 81040 Goztepe-Istanbul, Turkey, Tel: +90 2163459090/231, Fax: +90 2163388060, E-mail: haleb@ttnet.net.tr or icce2004@marmara.edu.tr

15–20 August 2004 • Physical Organic Chemistry • Shanghai, China
17th IUPAC Conference on Physical Organic Chemistry, (ICPOC-17)
Prof. Guo-Zhen Ji, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 354 Fenglin Road, Shanghai 200032, China, Tel: +86 21-64163300, Fax: +86 21-64166128, E-mail: jigz@pub.sioc.ac.cn

17–21 August 2004 • Chemical Thermodynamics • Beijing, China
18th IUPAC Conference on Chemical Thermodynamics
Prof. Haike Yan, Chairman, 18th ICCT c/o Chinese Chemical Society, PO Box 2709, Beijing, 100080, China, Tel.: +86 10 62568157, 86 10 62564020, Fax: +86 10 62568157, E-mail: qiuxb@infoc3.icas.ac.cn

20–25 August 2004 • Heteroatom Chemistry • Shanghai, China
7th International Conference on Heteroatom Chemistry (ICHAC-7)
Prof. Yong Tang, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 354 Fenglin Road, Shanghai 200032, China, Tel: +86-21-64163300- 3405, Fax: +86-21-64166128, E-mail: ICHAC@pub.sioc.ac.cn

3–5 September 2004 • Chemistry of Vanadium • Szeged, Hungary
4th International Symposium on Chemistry and Biological Chemistry of Vanadium
Prof. Tamas Kiss, University of Szeged, Department of Inorganic and Analytical Chemistry, PO Box 440, H-6701 Szeged, Hungary, Tel.: +36 62 544337, Fax: +36 62 420505, E-mail: tkiss@chem.u-szeged.hu

17–22 October 2004 • Biotechnology • Santiago, Chile
12th International Biotechnology Symposium
Prof. Juan A. Asenjo, Centre for Biochemical Engineering and Biotechnology, University of Chile, Beauchef 861, Santiago, Chile, Tel.: +56 2 6784288, Fax: +56 2 6991084, E-mail: juasenjo@cec.uchile.cl or IBS2004@conicyt.cl

International Union of Pure and Applied Chemistry

IUPAC

announces the 2004

IUPAC Prize for Young Chemists

The IUPAC Prize for Young Chemists has been established to encourage outstanding **young research scientists** at the beginning of their careers. The prize will be given for the **most outstanding Ph.D. thesis** in the general area of the **chemical sciences**, as described in a 1000-word essay.

Prize USD 1000 and travel
to the IUPAC Congress in Beijing, China, August 2005

Each awardee will be invited to present a poster on his/her research and to participate in a plenary award session.

Call for Nominations
(deadline 1 February 2004)

For more information, including application form, please visit the IUPAC Web site at **www.iupac.org/news/prize.html**
or contact the Secretariat by e-mail at <secretariat@iupac.org>
or by fax: +1 919 485 8706

International Union of Pure and Applied Chemistry

Advancing the worldwide role of chemistry for the benefit of Mankind

Mission Statement—IUPAC is a non-governmental organization of member countries that encompass more than 85% of the world's chemical sciences and industries. IUPAC addresses international issues in the chemical sciences utilizing expert volunteers from its member countries. IUPAC provides leadership, facilitation, and encouragement of chemistry and promotes the norms, values, standards, and ethics of science and the free exchange of scientific information. Scientists have unimpeded access to IUPAC activities and reports. In fulfilling this mission, IUPAC effectively contributes to the worldwide understanding and application of the chemical sciences, to the betterment of the human condition.

National Adhering Organizations

Asociación Química Argentina *(Argentina)*
Australian Academy of Science *(Australia)*
Österreichische Akademie der Wissenschaften *(Austria)*
The Royal Academies for the Sciences and Arts of Belgium *(Belgium)*
Brazilian Chemistry Committee for IUPAC *(Brazil)*
Bulgarian Academy of Sciences *(Bulgaria)*
National Research Council of Canada *(Canada)*
Sociedad Chilena de Química *(Chile)*
Chinese Chemical Society *(China)*
Chemical Society located in Taipei *(China)*
Croatian Chemical Society *(Croatia)*
Czech National Committee for Chemistry *(Czech Republic)*
Den Kongelige Danske Videnskabernes Selskab *(Denmark)*
National Committee for IUPAC *(Egypt)*
Suomen Kemian Seura *(Finland)*
Comité National Français de la Chimie *(France)*
Deutscher Zentralausschuss für Chemie *(Germany)*
Association of Greek Chemists *(Greece)*
Hungarian Academy of Sciences *(Hungary)*
Indian National Science Academy *(India)*
Royal Irish Academy *(Ireland)*
Israel Academy of Sciences and Humanities *(Israel)*
Consiglio Nazionale delle Ricerche *(Italy)*
Science Council of Japan *(Japan)*
Korean Chemical Society *(Korea)*
Kuwait Chemical Society *(Kuwait)*
Koninklijke Nederlandse Chemische Vereniging *(Netherlands)*
Royal Society of New Zealand *(New Zealand)*
Norsk Kjemisk Selskap *(Norway)*
Chemical Society of Pakistan *(Pakistan)*
Polska Akademia Nauk *(Poland)*
Sociedade Portuguesa de Química *(Portugal)*
Colegio de Químicos de Puerto Rico *(Puerto Rico)*
Russian Academy of Sciences *(Russia)*
Slovak Chemical Society *(Slovakia)*
Slovenian Chemical Society *(Slovenia)*
National Research Foundation *(South Africa)*
Oficina de Ciencia y Tecnología *(Spain)*
Svenska Nationalkommittén för Kemi *(Sweden)*
Schweizerische Chemische Gesellschaft *(Switzerland)*
Türkiye Kimya Dernegi *(Turkey)*
Royal Society of Chemistry *(United Kingdom)*
National Research Council, National Academy of Sciences *(USA)*
Union of Yugoslav Chemical Societies *(Yugoslavia)*

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