

**IUPAC Committee on Chemistry and Industry (COCI)
Preliminary Meeting on Chemical Education
Sundsvall, Sweden
7 June 2002**

Present:

Nelson Wright, Chairman	12539 Rue Ranger, Montreal, PQ, Canada
Mark C. Cesa, Secretary	BP Chemicals Inc., USA
Paul De Bievre	President, National Committee on Chemistry, Belgium
H.-Luzius Senti	Chatel Dessous, CH-1271 Givrins, Switzerland
Jinliang Qiao	Research Institute of Chemical Industry, SINOPEC, China
Min-Che Chon	President, Chon International Co., Ltd, Korea/Seoul
Aldo Bologna Alles (Obs.)	Lactosan-McCormick, Uruguay
Akira Ishitani	Kanagawa Academy of Science and Technology, Japan
Esma Toprak (Observer)	Chemical Engineering Department, Bogazici University, Turkey
Michael D. Booth	Chemical and Allied Industries' Association, South Africa
Mikhail V. Gorelik	NIOPIK, Russia
Alan Smith	Hydowns Farm, Woodlands, Wimborne, Dorset, UK
Jonas Unger	Ungernet AB, Sweden

Visitors:

Ebba Wahlström	Stockholm University, Chemistry Teachers Resource Center
Liev Sydnes	Vice President, IUPAC
Peter W. Atkins	Chairman, IUPAC CCE
Lars Ivar Eldring	Swedish National Committee for Chemistry
Ivar Giaever	Nobel Laureate, General Electric (retired)
Alexandre Pokrovsky	Division of Basic and Engineering Sciences, UNESCO

Some Swedish examples of how to promote chemistry in schools (Wahlström)

Ebba Wahlström of the Stockholm University Chemistry Teachers Resource Center, a national center since 1994, made a presentation to the members on the above topic. Some notes on her slides are below.

1. Why be a scientist?

Ms. Wahlstrom listed some of the problems teachers face in their careers, particularly as they relate to the public image of science and scientists. Few students want to become science teachers. Science teachers face special problems of responsibility (social, pedagogic, safety), and there is a lack of awareness of the complexity of these issues. There can be too little personal development and in-service training for teachers, and teacher self-esteem can be low. Curriculum changes are too frequent. The public image of chemistry is perceived to be far from reality. There are two "streams" for science education in Sweden, the technical stream and the science stream, and the more applied subjects (the technical stream) are preferred by most students.

2. Ebba's chemistry tree for CTRC

The roots of the chemistry tree are the Ministry of Education, Industry, and Universities, and the branches represent different sources for information on chemistry. Activities of the CTRC are summarized on their web site <http://www.krc.su.se>. They also publish a newsletter, hold conferences, influence safety practices, communicate with the public through newspaper articles, and exert influence on chemistry curricula. The CTRC provides

educational resources in the form of question-and-answer sheets, in-service training, suggestions for programs, videos, etc.

3. Materials

The kinds of educational materials the CTCRC provides include: ways to identify requirements; making, testing, writing; open experiments; test questions for higher grades; experiments for new B curriculum (2ND chem course); topical information on pulp and paper industry; Modern Materials learning box; topical information on the oil industry; food chemistry; materials for middle school (box of materials to do experiments, and in-service training to use it); topical information on pharmaceuticals.

4. Conferences and in-service training

Examples of such offerings from the CTCRC include: two-day summer courses on various subjects; tailor-made in-service training on demand, 1-2 days duration, experiment-based; regional conferences for middle schools, grade 7-9, 14 to 16 year olds, on topics such as industrial chemistry and safety, where sharing of ideas is encouraged; "the Chemistry cupboard," course for grade 0-5 teachers with no science background; 5 points (corresponding to 5 weeks hard work, regional course).

Dr. Sydnes asked whether there were procedures to solicit ideas and evaluation comments from teachers on the materials, as a means to keep teachers from just squirreling the materials away, and whether in-service courses were offered to encourage teachers to use them. Mr. Unger commented that there is a written newsletter for teachers.

Dr. Pokrovsky asked whether there were connections between the Nordic countries on the CTCRC initiatives. There are none. He also asked whether there are common standards. Ms. Wahlstrom answered that there were none, not even regionally within Sweden. Dr. Pokrovsky made two proposals: 1. He offered DIDAC for Ms. Wahlström's evaluation free of charge, and asked for her help to get the materials translated into Swedish. In return the CTCRC would receive DIDAC to distribute for free. 2. Microsense Experiments: Dr. Pokrovsky will send a kit to Ms. Wahlstrom for evaluation and comments. Again, if Wahlstrom could arrange for translation of the Microsense Experiments materials into Swedish, the CTCRC will get kits for free distribution in Sweden.

IUPAC-UNESCO DIDAC project (Pokrovsky)

See program book, sect. 4, p. 69. Dr. Pokrovsky provided an update. There are 47 new countries in which DIDAC has been distributed. A recent de-emphasis of chemistry within Agfa-Gevaert, the developer of the DIDAC materials, means less interest in the program on their part. In response, UNESCO will obtain the 2200 remaining sets from Agfa-Gevaert, which are worth \$210,000. UNESCO will receive author rights to make any modifications, with rights to free distribution. UNESCO must produce a CD-ROM version of the DIDAC materials from which DIDAC can be printed as book. The cost of production of the CD-ROM will be \$40,000. Agfa will contribute \$5,000 for this; \$10,000 will be provided by UNESCO, and Dr. Pokrovsky asked for \$10,000 from IUPAC. He reported that the module on Atmosphere and Air needs to be rewritten and updated to be an independent module. 15000 copies of the DIDAC posters (two sided to save costs) will be printed. Dr. Pokrovsky plans to upload DIDAC to the Internet for free. He has also obtained a grant for \$300,000 for distribution of Microsense Experiments materials in 22 countries in Africa.

Dr. Atkins asked, in response to the request for IUPAC funds for DIDAC, for evidence that DIDAC is having the educational benefits hoped for in areas where it has been distributed to date. Dr. Pokrovsky reported seeing improved acceptance when it had been translated into

the local language. Dr. Atkins offered to have the IUPAC Committee on Chemistry Education (CCE) monitor DIDAC's acceptance and successful use. Dr. Chon reported on distribution of DIDAC in Korea after translation, and Dr. Ishitani reported that translation is in progress for Japan.

Committee on Chemistry Education (Atkins)

Dr. Atkins reported on the activities of the newly re-titled Committee on Chemistry Education. The terms of reference for CCE are to be enlarged; the CCE should continue to evaluate education. The CCE's sphere of influence will go beyond secondary education to include all levels; college and primary education in chemistry will come when persons with specific expertise can be included on the committee. The CCE will also include activities regarding chemistry and the public. 2 committees have been formed, to focus on developing countries and on public understanding of chemistry. The CCE strategy is being developed for presentation to CCE membership at its meeting in Beijing in August 2002. CCE officers concur on the following strategic tenets: to institute a regionalization of approach (curriculum development where appropriate), to focus on South America, Africa, the Indian subcontinent, Southeast Asia, and the Caribbean; to act as a resource to promote public appreciation of chemistry; to raise esteem for chemical educators via promotion of a reward system. COCI was asked to consider establishing awards to teachers, much as ACS currently does, and the question was asked whether greater IUPAC involvement in Chemistry Olympiad could relate to this. Dr. Atkins asked for ideas from COCI.

Dr. Giaever pointed out that the viewpoint of physics with respect to education and interest in the field is similar to observations and experience in chemistry.

IUPAC and promotion of chemistry to the younger generation

Dr. Sydnes commented that there is a need for better communication between countries. IUPAC also needs better contact with industry in many countries. Industry will contribute to focused programs related to their interests. IUPAC's job is to facilitate these objectives long-term.

There was discussion about problems such as the image of chemistry, educating the very young about everyday chemistry, and the distribution of IUPAC periodic tables.