Chemistry Education

by Jan Apotheker

The IUPAC Committee on Chemistry Education (CCE) held its annual meeting on Sunday 11 and Monday 12 August 2013, during the IUPAC General Assembly held in Istanbul, Turkey. During the meeting three projects were competing for attention. On Sunday the meeting had quite a few guests, in total 20 National Representatives (NRs) and Titular and Associate Members (TMs and AMs). We had six to eight young observers as well as a few other guests during the Sunday meeting. 19 NRs, TMs and AMs attended Monday's meeting.

First we paid our respects to Erica Steenberg, Titular Member, who passed away recently at the early age of 60. She was very active in the Young Ambassadors for Chemistry project as well as in the water project for the International Year of Chemistry. Also, a former secretary and chair has passed, professor Krishna Sane.

After dealing with minutes and reports before the coffee, we started on the interaction with divisions and standing committees, as well as our own activities.

The Inorganic Chemistry Division presented updates on the periodic table of isotopes which is nearing completion and which gives a very complete overview of the isotope composition of the elements. The table itself was presented. A proposal for an interactive website is under development by Peter Mahaffy's group. The Physical and Biophysical Chemistry Division had organized a cartoon competition about subjects in thermodynamics in the IYC. They have repeated the competition since then. They would like to use our network in order to get more responses. The Organic and Biomolecular Chemistry Division has worked together with the Chemistry and Human Health Division on the production of an information booklet about toxicology that can be used in secondary schools. With the Chemistry and the Environment Division, the CCE discussed the ways in which cooperation could be developed in the future. The environment is a very important issue for education. The Polymer Division is trying to get teachers and writers to use the IUPAC nomenclature for polymers in their textbooks. In the Analytical Chemistry Division, an older discussion flared up again: the discussion is about the definition of the mole and the definition of the kg within the SI. Everybody agrees the mole is quantity of N_A particles, where N_A is a natural constant. The argument is about the definition of the kilogram. Everybody agrees that the definition of the kilogram being "the mass of a block of platinum, saved in Paris" is not satisfactory. The CCE was urged to consider the issue and engage in ongoing consultations. Finally, the last division, about nomenclature, has asked the members of CCE to give feedback on the newly designed short guide on organic nomenclature. Mei-Hung Chiu (CCE chair) and Jan Apotheker (Secretary) visited all divisions during their own meetings a couple of days before, on Friday.

CCE Chair Mei-Hung Chiu (first row, center) with Jan Apotheker, CCE members, and friends

Three projects were reported during the CCE meeting. Maja Elmgren presented the work of the group on higher education, using learning outcomes as tools to improve education in undergraduate schools. The group will report in Toronto during the 2014

International Conference on Chemical Education (ICCE). The results of the workgroup were very promising. Using learning outcomes forces teachers to define their assessment in terms of the desired learning outcomes. Assessment is often the driving force for the choice of learning activities. Starting by defining learning outcomes in an active way is an instrument to have teachers look at their educational activities in a different way. It demonstrates the coherence between goals and objectives, learning activities and assessment. The importance of curricular alignment is stressed.

Mei-Hung Chiu's project focuses on secondary education. In their meeting, the participants discussed ways to standardize education in secondary schools. The idea is to formulate a standard for secondary education, which can be used by emerging countries as a standard in their educational system. The group came up with a system to describe chemistry curriculum. The members of the group will use the system to describe the education in their own country and in one or two neighboring countries. They will also report the preliminary outcomes of this project at ICCE in Toronto.

The last project concerned the cooperation between OPCW and the CCE. Peter Mahaffy, Tueh King Soon, and Jan Apotheker, as members of a Working Group on outreach and education of the OPCW, decided to rejuvenate a project (IUPAC project 2005-028-1-050) that was started by Alistair Hay and Peter Mahaffy in 2005 as a result of an earlier workshop. They revised the material focusing on dual use of chemicals and related ethical issues of the role of chemists. This has resulted in the production of online material, which is available since September 2013 (see www.iupac.org/multiple-uses-of-chemicals).

During the last part of Sunday's meeting the Flying Chemists Program and the Young Ambassadors of Chemistry program were reviewed.

On Monday CCE decided that the next ICCE in 2016 will be held in Kuching, Malaysia. The Division of Chemical Education of EuChemS was enthusiastic about the cooperation with CCE in Rome and would like to repeat this experience in 2018. Berlin was mentioned as a possible location for a joint ECRICE/ICCE.

Last we said goodbye to two Titular Members that served the CCE for a long time: Professor Choon Do and Professor Eva Åkesson were presented with a commemorative plaque to thank them for all their efforts.

World Chemistry *Young* Leadership Meeting: Echoes from the 2013 Meeting

by Michael Droescher

The World Chemistry Leadership Meeting (WCLM) is a long-standing activity at the IUPAC General Assembly (GA). Always a strategy meeting, it focuses on IUPAC's trajectory and global issues. The topics in recent meetings were: IUPAC as a global NGO for Chemistry, international chemicals management (WCLM 2007, *Chem Int* Jan-Feb 2008, p. 10; www.iupac.org/publications/ci/2008/3001/3_humphris.html) and chemistry's role in delivering sustainable development (WCLM 2011, *Chem Int* Mar-Apr 2012, p. 12; (www.iupac.org/publications/ci/2012/3402/3_humphris.html). In August 2013, the contexts were the International Year of Chemistry 2011, the Rio +20 process, and IUPAC's role in the future of chemistry.

A team comprised of Colin Humphris, Carolyn Ribes, and me from the Committee on Chemistry and Industry (COCI); Javier Garcia from the Committee on Chemistry Education (CCE) and the Inorganic Chemistry Division; and Fabienne Meyers from the IUPAC Secretariat, set out to find new ways to run this year's WCLM. We were supported by vice president Mark Cesa, and additional members of the Bureau, including Natalia Tarasova, Mei-Hung Chiu, Ram Lamba, Krishna Ganesh, and Christopher Brett.

The WCLM means bringing leaders of chemistry together. Leaders of today have been young observers—or better, young participants—before. Why not ask younger chemists early in their career for their opinion on the strategic challenges IUPAC is facing? That is what we did in Istanbul. First we made sure to bring a large group of young chemists from all parts of the world to Istanbul. We asked the National Adhering Organizations (NAOs) for support. Several NAOs, including France, Germany, Japan, Russia, the UK, and the US helped finance the trips of young chemists. Also, there were young observers sponsored through the Congress. Thus, we got a group of more than 40 young observers and participants together, and all contributed to the WCLM. They truly were the "United Nations of Chemists" in Istanbul; a term they coined for IUPAC.

The idea was to let the young participants discuss and develop answers to the four issues presented: the future of chemistry in the context of the Millennium Development Goals; the scope of pure and applied