



Conference Report

Report on 17th International Symposium on Solubility Phenomena and Related Equilibrium Processes (ISSP17)

Montserrat Filella^{*a} and Wolfgang Hummel^{*b}

^{*}Correspondence: Dr. M. Filella^a, Dr. W. Hummel^b, ^aInstitute F.-A. Forel, University of Geneva, Boulevard Carl-Vogt 66, CH-1205 Geneva, E-mail: montserrat.filella@unige.ch; ^bPaul Scherrer Institute, Laboratory for Waste Management, OFLA/208, CH-5232 Villigen PSI, E-mail: wolfgang.hummel@psi.ch

The 17th International Symposium on Solubility Phenomena and Related Equilibrium Processes (ISSP17) took place on 24 to 29 July 2016 at the University of Geneva, Switzerland. Geneva offered a perfect setting for ISSP17, the latest in this biennial series of symposia organized by the International Union of Pure and Applied Chemistry (IUPAC) Subcommittee on Solubility and Equilibrium Data (SSED). This cosmopolitan city was perfectly suited to the friendly and multicultural tradition of this well-established conference, which saw over 100 scientists with a shared interest in solubility come together for six days.

Solubility-related processes are of fundamental importance to a large number of scientific disciplines and practical applications, ranging from nuclear waste disposal to development of medicines and transport of pollutants. This range was well reflected in Geneva with a wide variety of oral sessions, introduced by keynote lectures, a general poster session and two applied workshops where invited speakers covered various emerging issues.

The conference was framed by two invited lecturers. The opening talk was given by **Judith McKenzie**, from ETH Zurich, who spoke on 'Microbes as geologic agents in the sedimentary equation'. She discussed the history and still-open questions of dolomite formation. The symposium was closed by **Clara F. Magalhães**, president of SSED, who discussed 'Stability and change in pieces of art', presenting thermodynamic insights into the changing colours of copper and lead-based pigments.

The topics addressed during the conference sessions included:

- Thermodynamic data evaluation and consistency. Keynote: 'Internally consistent thermodynamic data for hydrothermal mineral solubility equilibria in the system Ca-Mg-Na-K-Al-Si-O-H-C-Cl' by **Dan Miron**, ETH Zurich.

- Computer-assisted modelling. Two keynotes: 'Computer assisted modelling: ab initio, molecular dynamics and Monte Carlo' by **Sergey Churakov**, University of Bern / PSI and 'An overview of novel computational methods for equilibrium and kinetic calculations' by **Allan Leal**, ETH Zurich.

- Ionic liquids. Keynote: 'Gas solubility in ionic liquids: progress and prospects' by **Johan Jacquemin**, Queen's University, Belfast.

- Molten salts and high-ionic strength solutions. Keynote: 'Solubility phenomena in molten salt reactor fuel' by **Rudy Konings**, EC JRC Karlsruhe.

- Solubility and nanoparticles. Keynote: 'Thermodynamics of oxide systems as a function of particle size and surface chemistry' by **Juraj Majzlan**, Friedrich-Schiller University, Jena.

The workshop on 'Solubility in energy and waste issues of emerging concern' discussed water and drilling waste in unconventional shale gas production (**Rosemary Capo**, University of Pittsburgh), solubility issues in geothermal power plant operation (**Julia Scheiber**, GEIE), CO₂ sequestration in basaltic rocks (**Alexander Gysi**, Colorado School of Mines) and long-term behaviour of waste materials in radioactive and non-radioactive waste disposal projects (**Wolfgang Hummel**, PSI).

In collaboration with European Union COST action TD1470, a workshop on 'Technology-critical elements prone to hydrolysis in biological and environmental systems' dealt with less-studied elements that are seeing increasing use in new technologies in the fields of communication, mobility and green energy. **Montserrat Filella** introduced the objectives and scope of the COST action, before handing over to **Ann Valentine** (Temple University), who presented the strategies developed by Ascidiaceans to deal with very hydrolysis-prone metals. The use of gallium, indium and lanthanides in diagnostic and therapeutic radiopharmaceuticals and antibiotic and antiosteoporosis compounds was discussed by **Chris Orvig** (University of British Columbia).



Prof. Dewen Zeng, Qinghai Institute of Salt Lakes, Chinese Academy of Sciences.

An evening poster session with about 40 posters gave the organisers the opportunity to encourage scientific discussions with a glass of Swiss wine and cheeses. Three authors were awarded prizes for their posters: **Agathe Martignier** (Unicellular planktonic organisms: an intracellular environment chemically different from the surrounding freshwater), **Dongdong Li** (Accurate measurement of the co-saturation lines in the NaCl-MgCl₂-H₂O system and its application for MgCl₂·6H₂O purification using re-crystallization method) and **Ezgi Yalcintas** (Solubility of tetravalent UO₂(am,hyd) in alkaline carbonate solutions). Each was invited to give a brief oral presentation of their poster just before the closing lecture.

The symposium provided ample time for networking and fruitful scientific discussions during a visit to CERN, an informal



Professors Glenn Heffer (Murdoch University, Australia) and Earle Waghorne (University College Dublin, Ireland) judging the quality of the *perches du lac*.

and relaxing dinner in Creux-de-Genthod, a lovely site by the lake, where guests enjoyed *perches du lac* (lake perch), a typical Geneva dish. The event was closed by a gala dinner at Clos du Château, in a village belonging to the largest wine-producing municipality in Switzerland, Satigny.

Received: April 21, 2017