

## Editorial Afterword to the Special Issue

In order to greet the 36th International Conference on Solution Chemistry (36th ICSC) held in Xining, Qinghai, and organized by Qinghai Institute of Salt Lakes, Chinese Academy of Sciences, the special issue on Solution Chemistry was applied for and approved by the National Publication Administration of China.

I'd like to start this afterword by thanking the editorial office for giving me the opportunity to read such 10 excellent papers involved in the special issue. The papers cover the abundant content, including many branches of solution chemistry, such as stable and metastable phase equilibria in the multicomponent salt-water system, solution structure, applied solution chemistry and so on. The first two papers of them are special contributing manuscripts as the "Study Highlights" section of the issue. In my view, this issue reflects many of the significant progresses and the latest results that have taken place in the solution chemistry field in the last decade. In particular, the Li salt sequences for 20 brines in the hexa-component system  $\text{Li}^+$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}/\text{Cl}^-$ ,  $\text{SO}_4^{2-}$ ,  $-\text{H}_2\text{O}$  during the isothermal evaporation at 298 K have been predicted by a thermodynamic model proposed in 2003. The predicted results indicate that the first crystallized Li salt will be varied with composition;  $\text{Li}_2\text{SO}_4 \cdot \text{H}_2\text{O}$  will firstly appear in the brines of magnesium sulfate subtype, while  $\text{Li}_2\text{SO}_4 \cdot \text{K}_2\text{SO}_4$  or  $2\text{Li}_2\text{SO}_4 \cdot \text{Na}_2\text{SO}_4 \cdot \text{K}_2\text{SO}_4$  will emerge in sodium sulfate subtype and magnesium sulfate subtype with lower Mg/Li composition. These information extend our knowledge of Li chemistry and will provide some helpful suggests to solar pond technology of Li-brine process.

Water is the most abundant and unique green solvent on the earth. It is non-toxic to life and harmless to the earth's environment. Water is not only an important carrier for the formation and evolution of salt lakes and exploitation of salt resources, but also the only ultimate solvent for the separation, extraction, recovery and re-processing of the saline minerals. With the further development of aqueous solution thermodynamics, structural chemistry, dynamics and phase equilibrium of the salt-water system, the green solvent water will be an irreplaceable material basis in the operation of salt lake recycling economy, and has great potential to realize the matter circulation within the system. Green water-based solution chemistry is undoubtedly the most important development direction in the future. The green-chemistry movement has helped industry become much cleaner. But mindsets change slowly, and the revolution still has a long way to go [Nature 469, 18–20 (2011)].

Finally, I wish 36th ICSC every success. A broad international academic exchange network should be established and the follow-up substantive international science and technology cooperation should be further reinforced. Especially, international cooperation with scientists from countries along the Belt and Road should be strengthened, so as to ensure the reduction, reuse and recycling of salt resources and its sustainable development with joint efforts.

FANG Chun – hui

Qinghai Institute of Salt Lakes, Chinese Academy of Sciences

May 20, 2019