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Published online: 30 October 2020

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The 36th International Conference on Solution Chemistry (ICSC-2019) was organized by the Qinghai Institute of Salt Lakes of the Chinese Academy of Sciences (QISL, CAS) along with the Tianjin University of Science and Technology, Institute of Chemistry of CAS, Institute of Process Engineering of CAS, and Qinghai Chemical Society as co-organizers. It was held in Xining, China, on August 4–8, 2019. The venue city is located at the eastern part of the Qinghai–Tibet plateau, and the host, QISL, is an institution dedicated to salt lake research, including salt lake solution chemistry and comprehensive and efficient utilization of salt lake resources, in China.

The theme of ICSC-2019 was Solution Chemistry in Action, From Fundamental Research to Large-scale Industrial Applications. It covered a wide range of topics including ionic liquids, solution thermodynamics, biological effects in solution, solubility phenomena and phase equilibria, solution structure and dynamics, supercritical fluids and solutions under extreme conditions, colloids and interfaces, computational solution chemistry, and general solution chemistry and industrial applications of solutions.

Co-chaired by Professors Chunhui Fang, Tianlong Deng, Suojiang Zhang, and Buxing Han, the conference brought together 226 registered scientists from 22 countries, covering all the 6 inhabited continents. There were 5 plenary, 5 keynote, and 22 invited speakers. The conference also selected 30 additional oral presentations. A special youth forum session was set for young scientists, under 35 years old, and two winners were awarded out of 10 speakers. In addition, a total of 96 posters were presented, 5 presenters won the poster awards sponsored by Springer.

The conference also organized special visits to the plateau biological herbarium at the Northwest Institute of Plateau Biology of CAS, the Tibetan Medicine Museum of China, and the exhibition room at the Institute of Salt Lakes.

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Out of the cutting-edge research progress presented in the conference, 15 papers have been selected for this special issue. These manuscripts include both theoretical and experimental contributions, ranging from solution properties, phase equilibrium, and the behavior of biological molecules in solution. They feature several aspects of the theme of the conference, providing representative achievements in the respective laboratories and demonstrating that understanding the structures and properties of solutions is still a challenging task for scientists. The conference is over, but communication will continue with this special issue as a firm step forward.

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