Preface

The 19th International Conference on Chemical Thermodynamics (ICCT-19) took place as part of THERMO International 2006, together with the 16th Symposium on Thermophysical Properties and the 61st Calorimetry Conference, from 30 July to 4 August 2006 at the University of Colorado, Boulder, CO, USA. Dr. W. M. Haynes was President of the Executive Board of THERMO International 2006, and Drs. M. Frenkel, R. D. Chirico, and J. W. Magee were the organizers of ICCT. Overall, 768 speakers submitted the abstracts of their presentations, including about 30 students and 11 exhibitors, from 62 countries (235 from North America, 341 from Europe, 76 from Japan, and 33 from China). About 65 % of the participants were from academia and 15 % from industry, with 20 % from governmental and international organizations.

These individual conferences have an overlap of areas of interest, but this was the first time that they have been held jointly at the same site. This provided a unique opportunity for researchers and practitioners worldwide to meet and discuss a broad range of scientific problems in the fields of thermodynamics and thermophysical properties for a wide variety of systems, with applications in chemistry and other scientific and engineering disciplines.

After the official opening ceremony, there was an invited keynote presentation by Prof. W. A. Wakeham from the University of Southampton, Southampton, UK, entitled "Thermophysical property measurements: The journey from accuracy to fitness for purpose". The Rossini Award lecture was given by Prof. A. Navrotsky on "Calorimetry of nanoparticles, surfaces, interfaces, thin films, and multilayers".

The ICCT program consisted of nine symposia, some of which were held jointly with the other conferences. The plenary lecturers and invited speakers in these symposia, and the titles of the plenary lectures, were as follows:

- Electrolyte and Non-Electrolyte Solution Thermodynamics: J. M. Prausnitz (plenary), "Some promising frontiers in the thermodynamics of protein solutions"; C. G. Panayiotou, P. R. Tremaine, and T. Kimura (invited)
- Ionic Liquids: K. Seddon (plenary); "The mark of an educated mind"; L. P. N. Rebelo and C. J. Peters (invited)
- Molecular Modelling, Including Simulation: D. Evans (plenary), "The fluctuation and non-equilibrium free energy theorems: Theory and experiment"; H. Tanaka, J. Errington, and A. Klamt (invited)
- Thermochemistry and Molecular Energetics: J. A. de Sousa Martinho Simões (plenary), "Energetics of free radicals: Bridges between gas-phase and solution data"; W. E. Acree, Jr. and J. S. Chickos (invited)
- Thermodynamics and Properties in the Biological, Medical, Pharmaceutical, Agricultural, and Food Sectors: P. L. Privalov (plenary), "Thermodynamic problems in structural molecular biology"; J. M. Sanchez-Ruiz and H. H. Klump (invited)
- Databases, Data Systems, Software Applications, and Correlations: M. Satyro (plenary), "Life, data and everything"; R. L. Rowley and R. Sass (invited)
- Phase Equilibrium, Supercritical Fluids, and Separation Technologies: S. Sandler (plenary), "Computational quantum mechanics: An under-utilized tool for applied thermodynamics"; L. F. Vega and R. P. Danner (invited)
- Colloid and Interface Science: L. Piculell (plenary), "Controlling structure in associating polymer–surfactant mixtures"; H. K. Yan and K. Lohner (invited)

- New Materials: V. K. Pecharsky (plenary), "Structure, mechanism, and thermodynamics of novel rare-earth-based inter-metallic materials"; C. Staudt-Bickel and J. Pons (invited)

The plenary lectures, with the exception of the lecture by Prof. K. Seddon, are published in this issue.

There were workshops on New Experimental Techniques, with Profs. C. Schick and J. P. M. Trusler as invited speakers, on Properties and Processes for a Hydrogen-Based Economy, where Prof. C. J. Peters was the invited speaker, and on Thermodynamic Frontiers and Education, with Profs. R. N. Lichtenthaler and R. Battino as invited speakers.

In addition, there was a workshop on the Thermodynamic Properties of Hydration (with Prof. V. Majer as invited speaker), software demonstrations, and two afternoon poster sessions, with over 400 posters. The sessions were held in the well-appointed Stadium Club, against the beautiful backdrop of the Flatirons to the west and the plains stretching across to the east. IUPAC had donated three poster prizes, a framed certificate signed by IUPAC President Brian Henry, a copy of the IUPAC "Gold Book" and a two-year subscription to *Chemistry International*. These were awarded to Martinez-Herrera Melchor (Mexico), Lisa Ott (USA), and Isabel Marrucho (Spain).

Doctorate awards were presented by the International Association of Chemical Thermodynamics (IACT), with sponsorship from Elsevier. The four recipients were M. Fulem (Prague, Czech Republic), Y. U. Paulechka (Minsk, Belarus), E. Asabina (Nizhni Novgorod, Russian Federation), and J. Xu (Trondheim, Norway). They each received a certificate, plus a cash prize of $500, and presented their papers at the conference.

All the lectures demonstrated how chemical thermodynamics is making, and will continue to make, very significant contributions to the rapidly developing interdisciplinary fields such as the life sciences, new materials, medicine and pharmacy, new energy resources, the environment, separation technologies, agriculture, green chemistry, and so on. These are all extremely important issues for scientists worldwide, and particularly for those who are in developing or economically disadvantaged countries. The opportunity for face-to-face discussion and communication with scientists from developed countries was a great benefit, which will lead to further research and improved education.

The weather was most pleasant for the conference. This, together with the attractive setting of the campus, the welcoming reception, the conference banquet at the National Center for Atmospheric Research, and the high standard of the presentations, made this a memorable conference. In addition, there was a full program of tours for accompanying persons, which included a visit to the mile-high city (Denver). Our thanks are extended to the Conference Chair and Co-chairs, and to all members of the local Organizing Committee, the members of the International Advisory Committee, and the members of the International Scientific Committee. We are most grateful to IUPAC, the International Association of Chemical Thermodynamics, the National Institute of Standards and Technology, the American Society of Mechanical Engineers, and the American Institute of Chemical Engineers, Elsevier, Honeywell, and Mettler Toledo for sponsoring THERMO International 2006.

Thermodynamics will continue to be an important area of research for many years to come, with a wide range of applications from chemical engineering to the biosciences. We look forward to the presentation and discussion of the results of further advances in chemical thermodynamics at the next ICCT, which will take place in Warsaw, Poland in August 2008.

John H. Dymond
Conference Editor