

Preface

The 21st International Conference on Chemical Thermodynamics (ICCT-2010) was held in Tsukuba, Japan, on 1–6 August 2010, by the International Association of Chemical Thermodynamics (IACT) under the sponsorship of IUPAC. The organizing committee was chaired by Prof. T. Atake. The conference attracted more than 600 scientists from 37 different countries. During the conference period, the Rossini lecture and 9 plenary lectures were delivered. Forty invited papers and approximately 200 contributed papers were presented in 7 parallel sessions, together with about 300 poster presentations. The wide variety of fields in chemical thermodynamics is illustrated by the titles of a number of the symposia: “Fluids and fluid mixtures”, “Phase equilibria”, “Foods and pharmaceuticals”, “Biothermodynamics”, “Colloids and interfaces”, “Thermochemistry and molecular energetics”, “Environmental issues”, “Industrial applications, databases and software”, “Theory and simulation”, “Organic materials and polymers”, “Inorganic materials and metals”, “New techniques”, “Education in chemical thermodynamics”, and a special session in honor of Profs. S. Seki and H. Suga. As part of the scientific program, two workshops were also held, the titles of which are: “Energy in subsections on petroleum, coal and alternative sources”, and “Calorimetry with commercial relaxation instruments”.

This issue of *Pure and Applied Chemistry* collects four selected plenary lectures delivered at the conference. The topics include challenges in teaching thermodynamics, new equations-of-state model of fluids and their mixtures, Gibbs energy minimization method in multiphase equilibria, and critical evaluation of thermophysical properties database in chemical process simulation. In these papers, we hope that the readers find the essence of the various aspects of current exciting research in chemical thermodynamics, which were exhibited in a lively manner during this successful conference. Other general papers presented in the symposia and workshops will be published in *J. Chem. Thermodynamics*, *Thermochimica Acta*, and *Molecular Simulation*.

The 22nd ICCT is scheduled to be held August 2012 in Búzios, Brazil.

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