

Preface

The International Symposium on New Frontiers of Thermal Studies of Materials was held at the 80th Anniversary Memorial Center (Sogo-Kenkyu-Kan) in Nagatsuta Yokohama Campus of the Tokyo Institute of Technology on 26–27 October, 1998. It was firstly planned by some active members of the Japan Society of Calorimetry and Thermal Analysis, and the proposal by Professor Tooru Atake at the Tokyo Institute of Technology was successfully accepted as a 1998's International Symposium supported by the Ministry of Education, Science, Sports and Culture, Japan. Thus in the end of 1997, it was organized by the Materials and Structures Laboratory, Tokyo Institute of Technology under the auspices of the Japan Society of Calorimetry and Thermal Analysis and the Society of Promotion for Calorimetry and Thermal Analysis, Japan. The Symposium was chaired by Professor Tooru Atake, and the members of the organizing committee were Professors Mitsuru Itoh, Hitoshi Kawaji, Hirofumi Hinode, Masaharu Oguni and Masataka Wakihara at the Tokyo Institute of Technology.

Thermodynamic studies have long been playing a very important role in various fields of science and technology. Thus the Symposium invited active researchers at the new frontiers of thermal studies of materials, without any further restrictions. 130 delegates (including 20 from overseas) attended the Symposium. In total, 58 papers (oral or poster) were presented. A variety of topics on new functional materials such as high-temperature superconductors, solid-state ionics, fullerenes and other inorganic and organic substances were discussed on the basis of new experimental techniques and theoretical approaches. The relationship between structure and the physicochemical properties, especially on phase transition and glass transition mechanisms, was stressed.

The keynote address was started by the Director of the Materials and Structures Laboratory, Professor Akira Sawaoka, and followed by Professor Hiroshi Suga (the past chairman of the Japan Society of Calorimetry and Thermal Analysis), Professor Hiroo Inokuchi (Professor Emeritus, University of Tokyo; National Space Development Agency of Japan), and Professor Edgar F. Westrum, Jr. (University of Michigan, U.S.A.). The 20 plenary lectures were as follows:

1. Edgar F. Westrum, Jr. (University of Michigan, U.S.A.) Modeling Sub- and Super-ambient Heat Capacities with the Lanthanide Contraction and Group IVA Compounds.
2. Svein Stř len (University of Oslo, Norway) Redox Thermochemistry of Non-stoichiometric Oxides Related to the Perovskite-, Brownmillerite- and K_2NiF_4 -type.
3. Hiroshi Suga (Kinki University) Thermally-induced Transition in Aqueous Solution of Cationic Surfactant Containing Aromatic Ring.
4. Michio Sorai (Osaka University) Thermal Studies on Spin Crossover Phenomena.
5. Janusz Nowotny (University of New South Wales, Australia) Impact of Interfaces on Properties of Ionic Solids and Performance of Electrochemical Devices.
6. Alexandra Navrotsky (University of California at Davis, U.S.A.) High Temperature Reaction Calorimetry Applied to Metastable and Nanophase Oxides and Oxyhydroxides.

7. Toshihide Tsuji (Jpn. Adv. Inst. Sci. Technol. Hokuriku) Heat Capacity of Intercalated Layered Materials Fe_xNbS_2 at Low Temperature.
8. Shoji Yamanaka (Hiroshima University) High T_c Superconductivity in Electron-doped Layered Metal Nitrides.
9. Michio Yamawaki (University of Tokyo) Study of Defect Chemistry of Lithium-based Oxide Ceramics with Vapor Pressure and Work Function Measurement.
10. Ichiro Hatta (Nagoya University) High-precision Heat Capacity Measurement of Liquid with Joule-heating AC Calorimetry
11. Mary Anne White (Dalhousie University, Canada) Thermal Conductivities of Molecular Materials.
12. C. Austen Angell (Arizona State University, U.S.A.) Calorimetric Methods for the Determination of Fragility in Liquids from Both Thermodynamic and Kinetic Approaches.
13. Jiri Malek (University of Pardubice, Czech Republic) Volume and Enthalpy Relaxation in Non-crystalline Solids.
14. Takasuke Matsuo (Osaka University) Deuteration-induced Phase Transitions in Hydrogen-bonded Crystals
15. Tsuneo Matsui (Nagoya University) Study on Phase Transitions of Functional Materials, Doped CeO_2 and Ti-Isotope Controlled PbTiO_3 , by Heat Capacity Measurement.
16. Kia L. Ngai (Naval Res. Lab., U.S.A.) Decoupled Molecular Dynamics of Small Molecule Glass-forming Liquids Confined in Nano-pores.
17. Hans-J. Hinz (Westfaelischen Wilhelms University, Germany) Dynamics and Thermodynamics of Protein Folding: Transformation of ROP from a Mesophilic into a Hyperthermophilic Protein.
18. Katsutada Takahashi (Osaka Prefecture University) Thermodynamic Properties of Formyltransferase from Hyperthermophilic Methanopyrus Kandleri.
19. Harumi Yokokawa (Natl. Inst. Mater. Chem. Res.) Generalized Chemical Potential Diagram and Its Utilization in Materials Chemistry
20. Takefumi Mitsuhashi (Natl. Inst. Res. Inorg. Mater.) Heat Capacity of $\text{Na}_{3-x}\text{Ru}_4\text{O}_9$

Finally, the concluding plenary discussion session was co-chaired by Professors White and Střilen.

30 selected papers were invited to contribute to the Proceedings, and 29 papers were submitted. After reviewing and revisions, finally 27 selected papers were accepted for publication in this special issue of the Journal of Thermal Analysis and Calorimetry. The financial supports provided by the Ministry of Education, Science, Sports and Culture, Japan; the Society of Promotion for Calorimetry and Thermal Analysis, Japan; Quantum Design Japan; Kansai Electronics Co., Ltd. and JECC Torisha Co., Ltd. are greatly appreciated. The efforts of the faculty member, Dr. Takeo Tojo, Secretary, Mrs. Nobuko Kaga, and all the students of our laboratory are also acknowledged. Finally, we wish to express many thanks for the valuable works of the editorial staff.