



ELSEVIER

Journal of Nuclear Materials 247 (1997) vii

---

---

journal of  
nuclear  
materials

---

---

## Preface

This special issue of the *Journal of Nuclear Materials* forms a partial record of the Ninth International Symposium on Thermodynamics of Nuclear Materials (STNM-9) which was held on August 25–30, 1996, at Toyonaka, Osaka, Japan, in conjunction with the 14th IUPAC Conference on Chemical Thermodynamics. Eighty papers were presented both orally and as posters at the Symposium by authors from eleven countries. Sixty four of these presentations are reproduced here in a special volume which serves as the official STNM-9 Proceedings.

The first STNM was held in 1962 in Vienna and was sponsored and organized by the International Atomic Energy Agency (IAEA). The IAEA also sponsored STNM held in 1965, 1969, 1974 (Vienna) and 1979 (Jülich, Germany). The proceedings of the first five STNM were published in book form by the IAEA. STNM-6 was held in Hamilton, Canada, in 1984, in conjunction with the 8th IUPAC Conference on Chemical Thermodynamics and 43rd Calorimetry Conference, and the Proceedings were published in this Journal (Volume 130, 1985). STNM-7 was held in Chicago, USA, in 1988, in conjunction with the combined AIME–TMS Fall Meeting and ASM International World Material Congress, and the proceedings were also published in this Journal (Volume 167, 1989). STNM-8 was held at Snowbird, USA, in conjunction with the 12th IUPAC Conference on Chemical Thermodynamics and the 47th Calorimetry Conference, and the proceedings were again published in this Journal (Volume 201, 1993). The first three meetings covered the full range of thermodynamic studies and methodologies, while the fourth, fifth and sixth meetings demonstrated increasing interaction between thermodynamicists and nuclear engineers, with many applied thermodynamics studies designed to obtain the data that engineers lacked. The seventh and eighth meetings reflected continuing expansions of topics to areas such as reactor safety, fusion reactor materials, and the front and back ends of the nuclear fuel cycle; however, a perceptible swing back to basic studies was noted.

For STNM-9, papers stressing thermodynamics were again solicited for the broadest range of nuclear applications. Under the general category of ‘basic properties’, papers were presented on phase relationships, thermal conductivities, and activity, heat capacity and enthalpy measurements. Other areas covered included vaporization, fission product behavior, reactor fuel behavior and fuel processing, equilibria in alloy and oxide systems and other systems. A plenary lecture was presented by Professor A. Pelton on thermodynamic modeling and phase equilibrium calculations in nuclear materials. Professor Pelton’s paper, however, is to be published in *Pure and Applied Chemistry*, the formal journal of IUPAC.

A particularly noteworthy feature of STNM-9 was the strong representation by Japanese participants – forty five of the eighty presented papers were from Japan, and almost all of them are reproduced here as full papers. It is also to be noted that, besides eleven papers contributed from India, some papers were presented from such Asian countries as China and Korea. In contrast, it was somewhat disappointing that contributions from American and European spheres were considerably reduced compared to previous Symposia.

The next Symposium is most probably to be held at Halifax, Canada, in conjunction with the 16th IUPAC Conference on Chemical Thermodynamics (ICCT-16/STNM-10).

The guest editors wish to extend sincere thanks to Professor H. Suga of Kinki University and Professor M. Sorai and his colleagues at Osaka University for their hard work in organizing ICCT-14 and for making the local arrangements. The eight symposia and six workshops format of ICCT-14 provided considerable variety, a good deal of synergism, and made for a highly enjoyable and stimulating conference. The principal organizer of STNM-9, Professor M. Yamawaki, wishes to acknowledge the willing support on STNM-9 by Dr M. Kanno, Emeritus Professor of the University of Tokyo, and also appreciate the efforts and enthusiasm of his co-organizers, Drs M.G. Adamson and H. Kleykamp, and the many individuals who served as session chairmen and who assisted with the review of the papers and other difficult jobs. Further, the sponsorship of the Atomic Energy Society of Japan in regard of ICCT-14/STNM-9 as well as heartfelt financial support by various companies and institutions, though their names are not cited here, are greatly acknowledged.

M. Yamawaki  
M.G. Adamson  
H. Kleykamp

*Guest Editors*