

INTERNATIONAL UNION OF PURE
AND APPLIED CHEMISTRY

PHYSICAL CHEMISTRY DIVISION

in conjunction with

CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE
SOCIÉTÉ FRANÇAISE DE CHIMIE
ASSOCIATION FRANÇAISE DE CALORIMÉTRIE ET D'ANALYSE THERMIQUE
UNIVERSITÉ BLAISE PASCAL

Main and Rossini lectures presented at the

**THIRTEENTH IUPAC CONFERENCE ON
CHEMICAL THERMODYNAMICS**

*held in Clermont-Ferrand, France
17–22 July 1994*

Conference Editor

JEAN-PIERRE E. GROLIER

Laboratoire de Thermodynamique et Génie Chimique, Université Blaise Pascal, 63177 Aubière, France

International Scientific Committee: *Chairman:* J.-P. E. Grolier (France); *Members:* J. M. G. Barthel (Germany); A. E. Beezer (UK); E. Behar (France); J.-M. Buisine (France); E. S. Domalski (USA); J. Dymond (UK); A. Heintz (Germany); H. V. Kehiaian (France); L. K. Koopal (Netherlands); R. Lichtenthaler (Germany); V. Majer (France); H. J. Matzke (Germany); P. A. G. O'Hare (USA); G. Olofsson (Sweden); C. Panayiotou (Greece); S. L. Randzio (Poland); P. A. Rodgers (USA); A. H. Roux (France); G. M. Schneider (Germany); E. Shock (USA); G. Sommsen (Netherlands); J. Vedel (France); W. A. Wakeham (UK); R. D. Weir (Canada); R. H. Wood (USA); W. Zielenkiewicz (Poland).

Local Arrangements Committee: *Chairman:* G. Roux-Desgranges; *Members:* C. Aucouturier; L. Bartovská; K. Busserolles; J.-Y. Coxam; S. Delcros; L. Dordain; G. Douh ret; C. Mathonat; C. Moreau; M.  bsil; J. R. Quint; L. Rodier-Renaud; *Secretariat:* R. G rard; L. Jardy.

Preface

This issue of *Pure and Applied Chemistry* contains the texts of the main lectures (plenary and invited), including the Rossini Lecture, presented at the Thirteenth International Conference on Chemical Thermodynamics held at Clermont-Ferrand, France, 17 to 22 July, 1994. The 13th ICCT was held jointly with the 25th AFCAT Conference (Association Française de Calorimétrie et d'Analyse Thermique) under the sponsorship of IUPAC through the Physical Chemistry Division and Commission I.2 on Thermodynamics. In the name of the Organizing Committee I would like to express our gratitude to the following institutions, agencies and enterprises, which have — through their generous support — contributed greatly to the Conference's success :

- Université Blaise Pascal
- Centre National de la Recherche Scientifique
- Ministère des Affaires Etrangères
- Laboratoire de Thermodynamique et Génie Chimique
- Gaz de France
- Institut Français du Pétrole
- Conseil Régional d'Auvergne
- Conseil Général du Puy de Dôme
- Mairie de Clermont-Ferrand

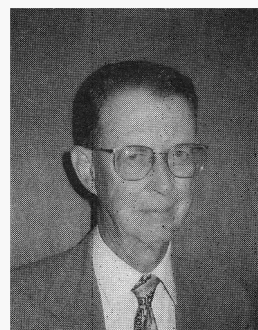
Reliable thermodynamic data concerning properties of pure substances and mixtures as well as chemical reactions are of prime importance for both the pure and the applied sciences. They are the basis for theoretical advances as well as for the development of new materials and processes. The large number and the scope of the papers presented in Clermont-Ferrand demonstrate the unabated, rapid growth of chemical thermodynamics. The program consisted of 21 plenary and invited (including Rossini Lecture), 204 oral and 224 poster presentations organized in 10 symposia devoted to experimental, theoretical and applied aspects of thermodynamics in the following areas : experimental thermodynamics, nonelectrolyte mixtures/molecular fluids, aqueous solutions at superambient conditions, interfaces/polydispersed systems/colloids, biothermodynamics/health/environment, advanced materials and new technologies, polymeric materials, nuclear materials, fluid phase/energy/industrial, databases/databanks. 450 scientists from 45 countries registered and the abstracts of 449 presentations have been collected in the Conference Program book. In addition, 150 accompanying persons were registered.

The *tenth Rossini Lecture* was presented by *Hendrick C. Van Ness*, Institute Professor Emeritus of Chemical Engineering at the Rensselaer Polytechnic Institute in Troy, New York, USA. Professor Van Ness received his B.S. and M.S. degrees from the University of Rochester, and his Doctor of Engineering degree from Yale University in 1953. After 4 years at Purdue, he has been a member of the faculty of the Rensselaer Polytechnic Institute since 1956 : he was appointed as Professor of Engineering in 1963, he was Union Carbide Professor from 1967 to 1972, and he became Institute Professor in 1983. Since 1989 he is Institute Professor Emeritus. Professor Van Ness was a Fulbright Lecturer at King's College in Newcastle-upon-Tyne, U.K., from 1958 to 1959, Visiting Professor at the University of California at Berkeley in 1966, and at the Institute for Kemiteknik, Danmarks Tekniske Højskole, Lyngby, Danmark, in 1977. He is a fellow of the American Institute of Chemical Engineers, and in 1988 he received the Warren K. Lewis Award (AIChE) for contributions to Chemical Engineering Education.

Professor Van Ness has contributed greatly to experimental, theoretical and pedagogical aspects of Chemical Thermodynamics. For instance, his designs of a heat of mixing calorimeter and of a vapor-liquid-equilibrium apparatus have served as prototypes of devices now used world-wide for accurate and rapid determinations of excess enthalpies and excess Gibbs energies, respectively. Parallel with experiment, he developed modern, efficient techniques for rational data reduction and data correlation and consistency tests, which topics are all of fundamental importance in Chemical Engineering.

In addition to his many publications, Professor Van Ness is author or co-author of some of the finest textbooks on Chemical Thermodynamics and its application in Chemical Engineering. In fact, generations of students, and not only students, have profited from his books. For instance, his *Introduction to Chemical Engineering Thermodynamics*, written with J.M. Smith, is now in its 4th edition. It has been the standard text for chemical engineering undergraduates for over 30 years and is certainly the most widely used chemical engineering text book of all times. Like all his publications, the book is distinguished by a clear, precise style and meticulous attention to detail, in short it is a pleasure to read it.

In recognition of his many achievements in, and contributions to, thermodynamics, the IUPAC Commission I.2 has honored Professor Hendrick C. Van Ness by electing him as the tenth Rossini Lecturer. The topic of his lecture entitled *Thermodynamics in the Treatment of VLE Data* is of pivotal importance in Chemical Thermodynamics. The text of his lecture is included in this issue.



Prof. J-P.E. Grolier
Conference Chairman and Editor

Prof. H.C. Van Ness
1994 Rossini Lecturer