

Preface

The history of chemical thermodynamics goes back 150 years and the subject has, for over a century, been the foundation for much of chemistry. This historical importance is often associated with an attitude that thermodynamics has little relevance to modern-day chemistry and will have little importance in the future development of chemistry. To counteract this, the IUPAC Commission 1.2 on Chemical Thermodynamics, published a volume entitled “Chemical Thermodynamics for the 21st Century” in 1999. It consisted of 27 chapters, all focusing on the applications of thermodynamics to very recent developments in chemistry. The aim was to highlight the role that thermodynamics was playing at the forefront of chemical research at the dawn of the 21st century. Three years later, in 2002, the International Association of Chemical Thermodynamics, IACT, the successor to Commission 1.2, decided to publish a collection of essays on applied chemical thermodynamic topics under the same editorship.

This new collection is aimed not only at those working in a specific area of Chemical Thermodynamics but also at the general chemist, the prospective researcher and those involved in funding chemical research.

The new volume is dedicated to the chemical industry and will show that thermodynamics is not only helping us to understand the world we live in but is also helping us to create a better world.

The topics for this volume have been chosen to include the very latest thermodynamic development in not only the traditional areas but also in newly established areas and potentially important new areas of chemistry. The traditional areas covered include aspects of:

- calorimetry
- microcalorimetry
- transport properties
- crystallization
- adsorption
- electrolyte systems
- transport fuels.

The newly established areas include:

- multiphase modelling
- reactive distillation

- non-equilibrium thermodynamics
- spectro-calorimetry.

Topics covered, which are considered potentially important to the chemical industry in the future, include:

- ionic liquids
- new materials
- ab initia quantum chemistry
- nano particles
- polymer recycling
- clathrates
- the economic value of applied thermodynamics.

The topics have all been written by specialists in the field and include some of the most important names in chemical engineering, thermodynamics and industrial applications of applied thermodynamics.

I wish to record my thanks to authors and to the publishers in producing a book of this breadth and importance.

T.M. Letcher
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