

Book reviews

Thermochemical Data of Elements and Compounds

B. Binnewies and E. Milke
Wiley–VCH Weinheim, 1999
928 pages. £170
ISBN 3-527-29775-8

This work is a compilation of thermochemical data, mainly for inorganic compounds. There are entries for a number of organic compounds, but very limited coverage of organometallic compounds. There are approximately 3600 entries, consisting of ΔH° and S° values at a single temperature, usually 298 K, along with, for the majority of entries, C_p data either at the same temperature or expressed as a temperature-dependent polynomial, so that ΔH° and S° for elements and compounds, as well as heats of reaction and equilibrium constants, can be calculated for other temperatures. Many of the compounds have separate entries for the solid, liquid and gas phases.

The order is strictly alphabetical, starting with Ag(s); all compounds with one silver atom come before those containing two silver atoms. A 30-page index maintains the alphabetical order, but alongside each entry, if appropriate, is the molecular formula written in the conventional way.

The data have not been obtained directly from the primary literature, but rely entirely on six secondary sources, including the *JANAF Thermochemical Tables* 3rd Edn, American Institute of Physics, New York, 1986. (Note the 4th Edn of the JANAF Tables became available in 1998.). The most recent of these has a 1992 date. Estimates of errors are not given and there is no discussion of reliability of the data; in fact there are only four pages of explanation, which include the equations needed to calculate thermodynamic values at different temperatures. The rest of the book is devoted to the data, which are presented in a compact, well-laid-out format.

This book will provide a convenient source of data for laboratories involved in synthesis of inorganic and organometallic compounds although, for the latter, data on the organometallic compounds as opposed to their precursors will mainly have to be drawn from other sources. The price will largely confine this volume to libraries.

RICHARD A. JACKSON
University of Sussex, UK

Biocatalysts for Fine Chemicals Synthesis

S. M. Roberts (ed.)
John Wiley & Sons, Ltd., Chichester, 1999
xiv + 728 pages. £250
ISBN 0-471-97901-5

Biotransformation, an application of microbial biotechnology in which enzymes are used to catalyse enantio- and regio-specific reactions, is well established in industry for the production of a diverse range of compounds such as organic solvents, antibiotics and vitamins. Less well known is the application of this technology to the production of fine chemicals, but biotransformation is ideally suited to this field because of the demand for safer, more environmentally friendly and low-cost alternatives to conventional reagents and catalysts, and for the need of experimentally simpler methods.

Biocatalysts for Fine Chemicals Synthesis is a compendium of the best protocols for enzyme-catalysed syntheses, which were originally published from 1992 to 1997 in loose-leaf format by the same publisher. It is divided into four main chapters covering hydrolysis and esterification reactions, reduction reactions, oxidation reactions and carbon–carbon bond-forming reactions. Each chapter is further divided into modules (45 in total) describing a specific type of chemical conversion. Each module includes an introduction to the reaction, a reaction scheme, the materials and methods it requires, a comparative assessment of the procedure by the authors of each module, and references and spectroscopic data where appropriate. One module covers the hydrolysis and esterification of organometallic substrates with specific reference to tributyltin and α -hydroxystannates. The book is prefaced by a chapter by the editor on the state of the art in 1996, which highlights the changes which have arisen in the application of biotransformations since 1992. The final chapter presents case studies with protocols which are intended to illustrate how biotransformations can be used for the production of specific non-racemic chiral compounds for application as either synthetic building blocks or target molecules.

The use of enzymes, whole cells or cell extracts in the catalysis of a broad range of chemical conversions has expanded markedly over the past decade. All the reagents required are available from commercial sources and all the reactions presented in this compendium can easily be carried out on a laboratory scale. Given the simplicity, high enantiomer-specific yield and low cost of biotransformations, this form of catalysis is certain to be applied to an even greater range of reactions in the future, some of which will successfully be scaled up for industrial use. This book presents detailed reaction