BOOKS

The Properties of Gases and Liquids, Third Edition, Robert C. Reid, John M. Prausnitz and Thomas K. Sherwood, McGraw-Hill (1977), 688 pages, $27.50.

The new edition of this standard reference work contains important changes and additions characterized in part by the addition of John Prausnitz as an author. Prausnitz' broad experience in development of thermodynamic property and phase equilibria estimation techniques has helped add a new dimension to the book in this area. Although the book has been extensively reorganized, the fine qualities of the first two editions with respect to comparative evaluation of physical property estimation methods and abundant references are retained.

The most important additions to the book are the discussions of modern equations of state in Chapter 3 and the new chapters on mixture combination rules (Chapter 4) and fluid-phase equilibria in multicomponent systems (Chapter 8). The discussion of some of the popular new generalized equations of state should be particularly valuable to workers in need of properties prediction methods for conceptual design of new energy conversion processes.

As will always be the case with such a reference text, almost continual updating is required. Needed subject areas for addition or expansion in the next edition are correlation of systems encountered in alternate energy processes, particularly coal conversion processes, modern correlation methods based on statistical mechanics, self-consistency of thermodynamic and transport property prediction methods, and mixture viscosity and thermal conductivity correlation methods, particularly for dense fluids.

KENNETH E. STARLING
School of Chemical Engineering
and Materials Science
The University of Oklahoma

Introduction to Chemical Engineering, Edward F. Thompson/William Ceckler, McGraw-Hill, 1977. 701 + xi pages, price $21.50.

Professors Thompson and Ceckler have written a well balanced, logically developed introductory text which is suitable for a first course in chemical engineering. Although it discusses the traditional material and energy balances covered in an introductory course, it also has lengthy discussions of specific chemical processes, including petroleum refining, phtalic anhydride production, fermentation, potassium chloride recovery, paper-making and (of course) the ubiquitous ammonia synthesis. Such subject specificity, often absent in entire four-year programs, is a welcome throwback to a previous era in chemical engineering education.

The text is an integrated treatment of material and energy balances, proceeding from simple concepts to more complicated systems involving recycle streams, chemical reaction and heat generation. Introductory comments are made in the areas of thermodynamics and separations, but the use of computers and material devoted to the ideal gas law and compressibility factors are noticeably absent.

Overall, this text provides a good introduction to chemical engineering. It includes about 250 problems and an excellent set of appendices including stream tables, API gravity tables, and properties of organic and inorganic compounds. Because of the authors' devotion to actual chemical processes, the book could even be a first reference book for chemical engineering students.

GERALD D. HOLDER
Department of Chemical Engineering
Columbia University

Phase Equilibria and Fluid Properties in the Chemical Industry, Edited by: T. S. Storvick and S. I. Sandler, ACS Symposium Series 60 (1977) $32.00. American Chemical Society, 537 pages.

The book is a collection of 30 papers which were presented at the Engineering Foundation Conference at Asilomar, California in January 1977. The conference was primarily financially supported by NSF. Of the 30 papers, 17 were authored by academicians, 10 by industrial technologists, and 3 by scientists from N.B.S. laboratories. The papers are greatly variable in length, going from papers of only a few pages to several of 50 pages. The quality of the papers is understandably variable also . . . . .

The book on the whole is a very useful and informative compilation of state-of-the-art material on phase equilibria problems primarily involving vapor-liquid two phase systems encountered in industrial applications. The reader is given considerable information on the application and accuracy of simple two-constant equation of state as well as equation of state containing higher number of constants. The application and utility of activity coefficient approaches for the liquid phase are presented, particularly rather new material on predictive schemes such as the group contribution methods of ASOG and UNIFAC. On the whole, computer approaches and creation of computer data banks are emphasized.

The book will prove useful as supplementary reading in graduate level courses of phase equilibria and should be a valuable reference for all technologists and researchers involved in industrial phase equilibria separation processes.

JAMES P. KOHN
Department of Chemical Engineering
University of Notre Dame