BOOKS

Ion Exchangers—Properties and Applications, Konrad Dorfiner, Ed. by Andrée Fé Coers, Ann Arbor Science Publishers, Inc., Mich. (1972). 317 pages. $17.50.

This excellent book is recommended highly, especially for engineers. It arrived at a time development work had led me back into the use of iron exchange as a processing tool. Despite my library on the subject, I have kept this book under lock and key for fear of its being involved in an irreversible "book exchange."

Why the strong praise? The book is well written, easy to read, and essentially free of mid-numbing jargon. In today's avalanche of scientific literature, much of it written in code; Dorfiner's text communicates. Hats off to the author and/or the translator.

Worth the price alone are the numerous tables of ion exchange materials and their properties that are available from various worldwide manufacturers. The subject matter and bibliography provide enough depth for all but the experts. Students and working engineers will find easy access to a wealth of useful information. Though emphasizing standard synthetic beaded ion exchangers, the author covers everything from ion exchange membranes and electrodialysis to liquid ion exchangers, from analytical techniques to large-scale industrial systems.

The book's strong point is also its most vulnerable. In today's climate of specialization the book may not specialize enough for some. Reading it cover to cover won't make you that specialist, but it gives a good start in the right direction.

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The Principles of Chemical Equilibrium, 3rd edit., Kenneth Denbigh, Cambridge University Press, New York (1971). 494 pages. Cloth $14.00. Paper $4.95.

As one might expect of a text entering its third edition, the virtues are many, the shortcomings few. The first 110 pages are an excellent review of the basic principles of thermodynamics. The development of the second law is one of the best anywhere. Students (and professors) have been befuddled for generations by the abstract nature of thermodynamics. Here concrete physical observations are shown step by step to lead logically and inevitably to the abstractions of entropy and the second law.

The next 220 pages cover most commendably the topics of phase and chemical equilibrium with two-thirds of this treatment devoted to the former. One of the few criticisms which might be raised is that Henry's law and Nernst's law are discussed as special cases of ideal solution behavior. This is mathematically correct, but a more physically realistic basis is to treat these laws as special cases of nonideal behavior.

The final 125 pages are devoted to statistical mechanics, and this is the least successful part of the text. As the author states, the extreme brevity of this introduction to such a vast subject requires a reduction in the rigor and thoroughness which characterizes the remainder of the book. The fundamental principles of statistical mechanics are developed from a point of view midway between the macroscopic development employed by Gibbs in his original work and the microscopic development adopted in many modern texts. A more conventional approach seems warranted for an introductory treatment of statistical mechanics.

Many interesting problems are found at the end of each chapter. The text is well written, and the approach is a highly personal one with many rare insights into thermodynamic phenomena. For example, the author shows that for many organic compounds the presence of air in the vapor enhances the predictive capability of the Clausius-Clapeyron equation. And on page 8 the author points out that ordinary water violates the standard interpretation of Gibb's phase rule.

Because of the book's thoroughness, clarity, rigor, originality, and interesting digressions, it belongs on the reference shelf of every serious student of chemical thermodynamics. The text is suited for advanced thermodynamics courses either at the senior or graduate level. Its use as a chemical engineering text is problematical. The theoretical content of the book is unequivocally excellent, but many topics relating to engineering practice are omitted. Thus for chemical engineers, as they are traditionally taught in this country, the book should be supplemented by some more practically oriented material from other sources.

Those familiar with the second edition will find little change. It is interesting, however, that as England rapidly converts to the metric system, Denbigh's book is a leader in this direction. This book, which in earlier editions made exclusive use of the metric system, is now largely converted to S.I. units (Système International d'Unités). Soon only American textbooks will remain to defend a system of units based on among other things the distance from the English king's finger to the tip of the English king's nose.

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Sewage Treatment (Basic Principles and Trends) 2nd Ed., R. L. Bolton and L. Klein, Ann Arbor Science Publishers, Inc., Mich. (1972). 256 pages. $14.50.

That so brief a book can treat so large a subject so well is no small tribute to the authors. *Sewage Treatment* is well characterized by its byline *Basic Principles and Trends* as it is essentially an introductory textbook. In general, it is well planned, employs clear writing, and has good tables and a good index. Some specific limitations include a lack of a glossary and/or list of symbols and abbreviations and the usage of combined sewers only for most textural examples. The major limitation, however, is that the book is thoroughly British. It does provide a good concise introduction to sewage treatment that should be valuable to most chemical engineers whether familiar with the subject or not.

The book begins with an excellent brief historical introduction that leads the reader from the origins of waste