# BOOKS

## Mass Transfer, Fundamentals and Applications

By Anthony L. Hines and Robert N. Maddox, Prentice Hall, 1985, 542 pp., $37.95.

This one-volume book includes an introduction to microscopic differential processes or transport phenomena and a general coverage of macroscopic separation processes—absorption, distillation, extraction and adsorption. Since this material is often taught in two successive courses with separate texts, the authors chose to use a single text that would better integrate the material as well as offer some economic advantage to the student. The idea will probably be a welcome one to many. However, it is difficult to see a great deal of interdependence between the two halves of the book. A chapter on phase equilibrium has been included as an aid to distillation and extraction process design. It is not a substitute for a basic thermodynamics course and serves only as a review of some fundamentals.

As would be expected in such a work, the coverage is somewhat uneven and abbreviated. The array of complex, generalized equations throughout the book may be intimidating and disturbing to the more practical reader. In many cases, development in a more simplified and direct form would have been more helpful.

Of the mass transfer section, the chapters on multicomponent absorption and distillation are outstanding. Short-cut methods as well as precise plate-to-plate calculations are illustrated, compared and discussed. Much of this material is the result of original work and interest of one of the authors. The chapter on adsorption is a welcome addition to the unit operations considered. The chapter on extraction covers in some detail the situation of partially miscible solvents but essentially ignores the more common case of mutually insoluble solvents and the concept of transfer units.

How successful the authors are in writing a text that fills their perceived need remains to be seen. There is no doubt, however, that the book merits a place in the reference or review library of the practicing chemical engineer.

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## Catalyst Poisoning

By L. Louis Hegedus and Robert W. McCabe, Marcel Dekker, 1984, 128 pp., $39.75.

The genesis of this book was a review prepared for the International Symposium on Catalyst Deactivation held in Antwerp in October, 1979. It went through one extension and was published in 1981 in *Catalyst Reviews-Science And Engineering*. This third publication suffers because *updating* does not include any references beyond 1980. The authors further limit themselves by centering around gas-solid systems and metal or metal-oxide catalysts. Zeolites are not considered.

It is arranged in increasing order of complexity, so it is suitable for both advanced students and for industrial chemical engineers working where catalyst poisoning is of interest. Because it is basically a review of the literature, it affords the student and the practitioner an opportunity to go more deeply into the subject. By discussing poisoning mechanisms and kinetic observations simultaneously, the authors establish the principle that the proof is in the observation. Unfortunately, in this difficult field,, similar observations may lead to multiple mechanistic interpretations, sometimes depending on the background and training of the authors of the original references. The authors of the book assume a noncritical stance, but the conflicting literature has surely engendered some controversy. It would have been nice to see some of it show through.

The last chapter is a synthesis of the best of the literature and the author's own work in a real life case history of the design of an automobile exhaust catalyst. The concise descriptions of the experiments and their results clarify that the close coupling between mechanism and kinetics was observed and exploited. Chemical engineers faced with a catalyst poisoning problem will find the authors' use of the literature an excellent model to follow.

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