And his point of view, formed from more than 25 years of personal experience in the area, is unique. Consider, for example, the last three chapters dealing with applications in petroleum engineering, in groundwater hydrology and in soils science. These areas represent different phases in the long-term and continuing research program of Professor Greenkorn and his students.

It is relatively easy to find fault with a book of this character. Some explanations and derivations could be clearer. A list of notation would have helped. While the use of a Hele-Shaw model to study single-phase flow in porous media is straightforward, a convincing explanation of why a Hele-Shaw model can be used to study the stability of a displacement of one phase by another is not given in Chapter 4.

To focus on such details is to miss the important point. We are very fortunate that Professor Greenkorn has taken this opportunity to share his experience with us. For the rather nominal consulting fee of $75.00 we can have his advice at our fingertips for the rest of our lives.

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Catalytic Reactor Design, by M. Orhan Tarhan. McGraw-Hill, 1983. 372 pages. $36.95

This text provides an introduction to process engineering aspects of heterogeneous catalytic reactor design, including computer solutions of design equations. It is not and does not purport to be a comprehensive reference on catalytic kinetics, nor does it spend a great deal of time on derivations of reactor design equations. It resembles, and in fact is based on, a set of notes for an industrial short course.

The book begins with three short chapters on reactor classification and design methodology, numerical methods for solving differential equations, and catalytic kinetic models. The next six chapters deal with the design of fixed-bed gas reactors, gas-liquid fixed-bed reactors (including trickle-bed reactors and fixed-bed bubble reactors), and suspended-bed reactors. Fluidized beds are not treated. The book concludes with three short qualitative chapters on laboratory and pilot plant reactor design, reactor safety and stability, and mechanical design of commercial reactors.

The author has had extensive experience in industrial reactor design, and writes in clear and straightforward expository prose. For each reactor type discussed, transport correlations are summarized, design equations are derived, and their solutions are outlined in examples based on commercially important processes. Fortran programs are presented which solve the design equations for adiabatic and nonadiabatic fixed-bed reactors and plug flow and backmixed trickle bed reactors.

There is no other book on the market that does quite the same thing that this one does, although it is less unique in dealing with the practical aspects of catalytic reactor design than the Preface implies. One reference that comes to mind is Satterfield's *Heterogeneous Catalysis in Practice*, an outstanding compendium of practical details of industrial catalysis, principally in areas only sketchily covered in this book such as catalyst selection, preparation, and characterization; another is Rase's two-volume set, *Chemical Reactor Design for Process Plants*, which provides a wealth of information on the practice of industrial reaction engineering.

Who should buy this book? In the Preface, the author states that he intended it for seniors and graduate students in chemical engineering and for industrial chemical engineers. Unfortunately, although it is written at a level accessible to seniors, I cannot see a role for it in the undergraduate curriculum—it fails to cover too many of the basics, and it has no problems that can be used for homework assignments. It might be used in a graduate course on catalytic reaction engineering, but only as a supplement to a text oriented more toward fundamentals (e.g. Carberry's *Chemical and Catalytic Reaction Engineering*) and others that provide more extensive coverage of industrial catalysis (e.g. the previously mentioned work of Satterfield) and catalytic chemistry (e.g. *Chemistry of Catalytic Processes* by Gates, Katzer, and Schuit.)

On the positive side, the book would undoubtedly be a worthwhile addition to the library of an industrial process engineer who wishes a series of short and readable reviews of design techniques for the types of reactors covered, and a good, albeit incomplete, compilation of references. In addition, course instructors who have traditionally relied on the time-honored A → B reaction to illustrate design methodology will find the book to be an excellent source of examples based on real process data.

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