ChE book reviews

CHEMICAL PROCESS COMPUTATIONS
by Raghu Raman
Elsevier Applied Science Publishers, 1985,
592 pages, $90

Reviewed by
Ihab Farag
University of New Hampshire

This is a very nice reference book which contains a wealth of algorithms and computer program listings (in FORTRAN) for solving a wide range of chemical engineering problems. The author set out to show how to develop algorithms and obtain solutions for a number of practical problems. In addition, it has a wealth of references and literature citations. I think the book would be useful for those seeking to solve modeling and simulation problems, but who do not have access to well-developed process simulators, *e.g.*, ASPEN PLUS (trademark of Aspen Technology, Cambridge, MA).

The seven chapters in the book are: Introduction, Estimation of Gas and Liquid Properties, Mass Transfer Operations, Flow of Fluids in Pipes, Heat Transfer, Chemical Reaction Engineering, and Chemical Process Simulation. The appendix has several useful sections on: Matrix Methods, Solution of Equations, Polynomial Approximation, Numerical Integration, Ordinary Differential Equations, Function Extermination, and Computation Errors. Within each chapter a number of models of varying degree of complexity are described. A sample list of examples given include: Application of UNIQUAC equation to obtain bubble point of a four-component mixture, four-component hydrocarbon mixture distillation, sizing of pipes for non-Newtonian flow, shell-and-tube heat exchanger calculation with phase change, process furnace analysis using Hottel's zone method, residence time distribution in a CSTR, three-phase fluidized bed countercurrent backmixing model, and aniline manufacture. The 100 computer programs are well-documented and have been tested to insure correctness.

The author, correctly so, assumes a basic understanding of unit operations and formulation of mathematical models. I believe this book should be a very useful reference for those interested in process simulation. I only wish it was possible to get the programs in the book on an IBM compatible floppy diskette. □