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Book Reviews

Hazardous Chemicals — Spills and Waterborne Transportation, S.S. Weidenbaum (ed.), American Institute of Chemical Engineers New York, New York, 1980, 147 pp. Price: Members $8.50, Non-members $20.

The book contains 22 papers presented at the August 1979 AIChE Meeting in Boston, Mass. The papers are divided into three sections: (1) Hazardous Chemical Spills (a general approach dealing with the U.S. Coast Guard's role), U.S. EPA's response team, information systems, personnel protection equipment, etc., (2) Waterborne Transportation of Hazardous Chemicals (including LNG vessel construction, vapour control (recovery, regulations)) and (3) synthetic and wire ropes for ocean systems.

G.F. BENNETT

Emergency Response Guide for Dangerous Goods, Published by Copp Clark Pitman, Toronto, Ontario, in cooperation with Transport Canada (Transport of Dangerous Goods Branch) and the Canadian Government Publishing Centre, Supply and Services, Canada, 1979, (Can.) $5.00, 352 pages.

The book is a handy guide to the dangers posed by hazardous materials and the response actions to be taken to combat problems involving them. Included in the book are (a) a listing of placards related to the transport of dangerous goods, (b) outline of the HAZCHEM action code system, (c) listing of chemicals both in French and English by alphabet and international number.

This books does not give specific information for each chemical, as does the CHRIS manual for example; the technique used by the Canadians is to refer one to a general response guide for chemicals possessing the same danger properties — i.e. corrosives, poisons, oxidizers, etc.

Under specific chemical listings, one is given only three items of information: (1) the HAZCHEM action code, (2) the international number for the chemical and (3) a secondary reference to a general listing, e.g. chlorine refers to page 3027, where one is advised on how to deal with "Compressed gas, Oxidizer, Poison".

Information given in the hazard page section for each class of chemicals includes data on: (1) potential hazards: (a) fire or explosion and (b) health. Emergency action information includes: (1) general actions, (2) fire response, (3) spill or leak response, (4) first aid. Finally, there is another short section on general precautionary measures.

All information for each class of response is on a single page. There are 86 general categories such as explosives, corrosion, radiation, etc.

This reviewer feels that this book is one of the best and most useful reference guides he has seen, useful not only in Canada but elsewhere for concise, easily accessible information on chemicals, their hazards and response to them.

G.F. BENNETT
The University of Toledo

Chemodynamics by Louis J. Thibodeaux, Wiley Interscience, N.Y. 1979, 501 pages.

Chemodynamics is an applied science actively concerned with the movement and fate of synthetic chemicals within the three geospheres of the environment: air, water and soil. Thibodeaux's goal in writing a book bearing this title was 'to present and evaluate existing methods commonly referred to as models, for studying the movement of substances from the site of entry into the environment to the various geospheres for the purpose of estimating exposure along the way'.

In writing the book, Thibodeaux has used a systems approach to cut across the boundaries of air, water and solid waste pollution tying them together with the common thread of mathematical models. The analogy here is to the chemical engineering texts written on transport phenomena as contrasted to the unit operations approach. First the author describes the problem qualitatively and then quantitatively in order to allow the engineering scientists-to-be (as this is primarily a textbook) to determine the rates, lifetimes, routes and reservoirs of chemical substances moving through the environment.

As stated above, the analogy to transport phenomena is clear and those graduates of the last decade willl have no problem recognizing this and using the book. Those a little older may be intimidated by the notation and models using more 'modern' mathematics, but if they persist they will find that the author's claim that 'the mathematical level is not particularly difficult with elementary calculus and linear first order differential equations are all that are needed,' is not too far from the truth — although many of the concepts are not particularly easy.

Those specializing in water pollution control will quickly recognize, in chapter one, the Streeter—Phelps equation that is used to calculate dissolved oxygen concentrations in streams as a function of waste loading, distance, etc. Unfamiliar, however, to civil engineers who generally use the equation, will be the model based on a classical chemical engineering, finite element mass balance emphasizing mass transfer and reaction rate coefficients.

Equilibrium at environmental interfaces is the title of the second chapter, with gas transfer being used (as in the Streeter—Phelps case) to illustrate the