

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.

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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 will 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

author's point initially, but with benthal/aqueous systems also being discussed.

Hazardous chemicals and oil in the environment are treated throughout the book, under appropriate models, especially in the problems that are supposed to be worked by the student. Examples include:

1. Runoff contamination from organic pesticides.
2. Cumene partitioning between water and oil slick phases.
3. Dispersion of heavy fuel oil on sea surfaces.

Two chapters of particular importance in chemical spills are 4 and 5, dealing with exchange rates between air and water, and forced convection dissolution in streams. The applications include, of course, rate of evaporation of volatile chemicals (chloroform) and the dissolution rates of spilled heavier-than-water chemicals (PCB) into flowing streams.

Based on extensive research work by the author over the past several years, this book represents a major step forward in the application of modern chemical engineering principles of transport phenomena to environmental models. The methods presented will yield a much more rigorous approach to the determination of spill impact, effects and fate.

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Handbook of Industrial Toxicology, by E.R. Plunkett, Chemical Publishing Co. Inc., New York, 1976, US\$ 36.00, 552 pages.

There are several books available to emergency response personnel or others who are routinely dealing with hazardous materials, that contain similar information on the toxicity of chemicals, but no one book contains everything one would like to know when confronted by a new, unusual or dangerous substance.

The asset of this book is the toxicity data given for approximately 1200 chemicals. For example, for acetaldehyde the following is reported:

Acetaldehyde — Toxicology

Route of Entry: Ingestion, inhalation.

Mode of action: Local irritant. Central nervous system depressant. Fatty degeneration of liver and kidneys.

Signs and Symptoms: Irritation of eyes and nose. Headache. Bronchitis.

Pulmonary edema. Dermatitis. Albuminuria. Chronic intoxication resembles that of chronic alcoholism.

Diagnostic Tests: None established.

Treatment: Irrigate eyes with water. Wash contaminated areas of body with soap and water. Gastric leverage, if ingested, followed by catharsis. Symptomatic and supportive.