

and the released product that is needed for site assessment. The reader is shown what information is needed and where it can be obtained. The book also provides default values for some parameters of field data that are not available or have not been collected.

Treatment technologies discussed include: soil venting, bioremediation, soil flushing, hydraulic methods, excavation, incineration, soil washing, enhanced volatilization, pump-and-treat, air stripping and carbon absorption.

An unique, and I think an extremely useful, aspect of the book is the series of tables (really check lists) designed to aid the reader/user in evaluating his potential remedial actions.

GARY F. BENNETT

*Where Did That Chemical Go? A Practical Guide to Chemical Fate and Transport in the Environment*, by R.E. Ney Jr, Van Nostrand Reinhold, New York, NY, 1990, ISBN 8-442-00457-5, 188 pp., \$ 36.95.

Having just reviewed Lyman, Reehl and Rosenblatt's book entitled *Handbook of Chemical Property Estimation*, which in great detail outlines formulae and methods for predicting fate and transport of chemicals in the environment, I was ready and eager for this book. It too contains techniques, albeit of a much simpler format, to allow the user to determine what happens to a chemical when it is released (accidentally or purposely) to the environment. The book (according to its cover jacket) explains a variety of prediction techniques involving such physical and chemical processes as water solubility, octanol-water (coefficient), hydrolysis, photolysis, volatilization, soil sorption, leaching in soil and runoff.

Chapter 1 (entitled Fundamentals) overviews the text's purpose in the use of techniques to predict fate and transport of chemicals in the environment. Topics discussed are: (a) fate and transport; and (b) environmental compartments (air, water, soil, plants, animals). Chapters 2 and 3 discuss prediction techniques and ways of using them. Discussed are (a) water solubility; (b) octanol water partition coefficient; (c) photolysis; (d) volatilization; (e) soil sorption; and (f) leaching in soils and soil runoff. In Chapter 3, biological processes, topics covered are (a) biodegradation and (b) bioaccumulation.

According to the preface Chapter 4 (entitled 'Exposure assessment') ties together the material of the previous chapters, showing how data and predictive techniques can be combined to assess the route of exposure.

Chapter 5 (entitled 'Examples') presents data for approximately 200 common chemicals along with characteristic data followed by discussion of what may happen to each chemical in the environment, as well as exposure considerations.

It has to be quickly noted that I, unlike the author who was a Section Chief in the Hazardous Evaluation Division, Environmental Fate Branch of the US EPA, am not an expert on Fate and Transport. Therefore a deeply technical critique of what he has presented is not possible. However, I can state that what I did read, from my chemical engineering/pollution background perspective, appears very elementary and simplistic. For a deeply technical analysis of the topic one would have to turn the prior cited work of Lyman et al.

The book, however, does look at the physical chemical data for a variety of chemicals (type, water solubility, etc.), such as the octanol-water partition coefficient,  $K_{oc}$ , and soil adsorption, and does make statements based on these data of what should happen environmentally to those chemicals on going into water solution, absorbing on soil, vaporizing, etc. In that context, the book is a quick reference. But to determine numerically (or quantitatively) the partitioning of these environmentally important chemicals between the various media would be difficult using the techniques presented.

GARY F. BENNETT

*Halogenated Solvent Cleaners: Emission Control Technologies and Cost Analysis*, by Radian Corporation, published by Noyes Data Corp., Park Ridge, NJ, 1990, ISBN 0-8155-1248-1, 223 pp., \$ 45.00.

This book is one of many reports written by environmental consultants for the U.S. Environmental Protection Agency to assist industry in complying with new environmental regulations. This book contains information on the use and control of halogenated solvents in solvent cleaning applications. Described are types of solvent cleaners manufactured, source of solvent emissions, methods of controlling these emissions and the cost associated with the installation of control devices.

Halogenated solvents are used to clean and/or condition the surface of metal parts, electronic parts and other non-porous surfaces. The five commonly used halogenated solvents are methylene chloride, trichloroethylene, perchloroethylene, trichlorotrifluoroethane and trichloroethylene. These chemicals possess the physical characteristics necessary to handle a variety of industrial cleaning situations with good cleaning power; moreover they are relatively safe from a flammability perspective. Consequently hundreds of millions of pounds of each chemical are used per year and a significant fraction of each is emitted to the environment. Being toxic, these emissions can pose a health hazard. Consequently, emission control is warranted.

Chapter titles include:

- Organic solvent cleaner characteristics and emissions
- Emission control techniques