

Handbook of Chemical Property Estimation Methods: Environmental Behaviour of Organic Compounds, by W. Lyman, W.F. Reehl and D.H. Rosenblatt, American Chemical Society, Washington, DC, 1990, ISBN 0-8412-1761-0, approx. 480 pp., \$ 49.95.

In the introductory overview the authors/editors state:

“This report contains selected estimation methods for several physical chemical properties of organic chemicals. The full list of properties covered is shown in Table 1. The general style of the report is that of a handbook with specific instructions for the use of each estimation method. It is hoped that the descriptions and examples will be useful to environmental chemists and environmental program managers who must frequently deal with problem chemicals for which even the most basic chemical properties may be missing from the literature or data collections.”

The authors' 'hope that the book will be useful' has been exceeded far beyond their most optimistic expectations. First published in 1982, the book has become probably the most cited reference in environmental literature, especially in the site remediation/Superfund literature where a wide variety of strange chemicals are being addressed.

Table 1 referred to above is really a Table of Contents of the book, which clearly elucidates the book's coverage:

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| (1) Octanol/water partition coefficient | (14) Vapor pressure |
| (2) Solubility in water | (15) Volatilization from water |
| (3) Solubility in various solvents | (16) Volatilization from soil |
| (4) Adsorption in various solvents | (17) Diffusion coefficients in air and water |
| (5) Bioconcentration factor in aquatic organisms | (18) Flash points of pure substances |
| (6) Acid dissociation constant | (19) Densities of vapors, liquids and solids |
| (7) Rate of hydrolysis | (20) Surface tension |
| (8) Rate of aqueous photolysis | (21) Interfacial tension with water |
| (9) Rate of biodegradation | (22) Liquid viscosity |
| (10) Atmospheric residence time | (23) Heat capacity |
| (11) Activity coefficient | (24) Thermal conductivity |
| (12) Boiling point | (25) Dipole moment |
| (13) Heat of vaporization | (26) Index of refraction |

The authors go on to state:

“The properties covered by the handbook include a variety of environmental properties of pure materials [e.g. density, boiling point, refractive index], some properties that describe how a chemical behaves or interacts with a second substance [e.g. solubility in water, diffusion coefficient in air, interfacial tension with water] and a set that described the fate of trace concentrations of the chemical in specific environmental situations [e.g. hydrolysis in water, atmospheric residence time, and volatilization from soil].”

It is these latter groups of property estimation methods (found in Chapters 8, 10, 15 and 16) that have found great utility in fate and transport calculations, most of them precede calculations of risk that an uncontrolled chemical in the environment poses. Indeed the authors note that the prediction of risk was the reason the book was written – originally appearing as a report written by the firm of Arthur D. Little for the US Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Maryland.

To bring a degree of uniformity to the text, the authors have structured each chapter thus:

- Introduction – describing the property, its important range of values and factors affecting those values
- Overview – of available estimation methods
- Method description
- Examples – generally to or more examples for each estimation method
- available data
- Symbols used
- References

The book is well written and beautifully reproduced: clear, easy to read type and diagrams. As I said, the text has become a classic reference and will become even more so as the new edition is more useful with its revisions.

GARY F. BENNETT

Cleanup of Petroleum Contaminated Sites Underground Storage Tanks, by W.J. Lyman, D.C. Noonan and P.J. Reidy, Noyes Data Corp., Park Ridge, NJ, 1990, ISBN 0-8155-1258-9, 216 pp., \$ 48.00.

As the US Environmental Protection Agency (EPA) contracts with consultants to produce reports that will assist industries with pressing environmental problems, Noyes Data makes these reports available through commercial literature (as opposed to leaving the sole notice of their existence through lists of government documents). And as the United States grapples with the removal and cleanup of its untold number of leaking underground storage tank sites, this book is extremely timely—and necessary.

This book focuses on strategies for the cleanup of petroleum-contaminated soils in the unsaturated and saturated zones of underground storage tank sites. A methodology is presented for evaluating the effectiveness of corrective action technologies at sites where petroleum products have contaminated either the unsaturated or saturated zone. The evaluation consists of a site assessment; selection of one or a series of treatment technologies, performance monitoring, and followup measurements.

The book identifies basic information about the subsurface environment