This book by the author's own admission is a defense of that "non-hazardous determination" policy. In it, he proves a technical assessment of combustion residues, environmentally benign characteristics and a blueprint to achieve ash utilization.

I believe Goodwin accomplishes his stated goals, and does it in six relatively short chapters entitled:

1. Fundamental concepts
2. Governmental regulations (both Federal and State)
3. Regulatory testing
4. Disposal consideration
5. Utilization methodology
6. Lessons and outlooks

GARY F. BENNETT

Illustrated Handbook of Physical Chemical Properties and Environmental Fate of Organic Chemicals, Vol. III, Volatile Organic Chemicals, by D. MacKay, W.Y. Shiu and K.C. Ma, Lewis Publishers, Boca Raton, FL, 1993, 916 pages, price US$ 95.00, ISBN 0-87371-973-5

This series of handbooks brings together physical–chemical data for similarly structured groups of chemical substances which influence their fate in the multimedia environment of air, water, soils and sediments and their resident biota. To assist scientists and engineers in environmental assessments, this handbook contains compilations of physical–chemical property data for series of chemicals, such as (in this volume) volatile organic compounds (VOCs).

The unique aspect of this book is the use of QSPR (quantitative structure–property relationship) analyses. The ultimate goal of employing this technique is to deduce physical–chemical properties, environmental partitioning and reaction tendencies and even uptake and effect on biota.

For the series of chemicals presented, QSPR plots were prepared by plotting properties governing environmental (solubility, vapor pressure, K_{OW}, etc.) against the LeBas molar volume. Fugacity Level III distributions for four emission scenarios in a general environment are given for most compounds.

In addition to these processes, data given for each chemical in the following groups: hydrocarbons, ethers and halogenated hydrocarbons include: chemical name; CAS number; structure; molecular mass; molar volume; melting and boiling points; water solubility; octanol–water partition coefficient; vapor pressure; organic carbon–water partition coefficient; bioconcentration factor; Henry's law constant; dissociation constant; estimated half-lives in air, water, soil and sediments.

Multiple values are given for many of the properties, illustrating the variance of reported data in the literature. However, a recommendation of the best value is given. Complete reference citations are given for all data sources.

Until now, the standard reference of environmental property data was Lyman, Rheel and Rosenblatt's treatise: *Handbook of Chemical Property Estimation Methods.* The new book will be a welcome and useful companion to it.

A unique aspect of the work is the prediction of likely chemical fate, which was performed by using a series of multimedia fugacity models. By entering physical–chemical data into a model, one can predict a chemical's behavior and fate in the environment. The results of these calculations are presented both numerically and pictorially.

GARY F. BENNETT

Major Accident Reporting System: Lessons Learned From Accidents Notified, by G. Drogaris, Elsevier Science, Amsterdam, 1993, 248 pages, price Dfl 290.00/US$ 165.75, ISBN 0-444-81665-8

This book contains descriptions of 121 accidents reported through the major accident reporting system (MARS) which has been established by the European Commission and operated by the Joint Research Centre of the Institute for Systems Engineering and Information — CDIR.

The goal of compiling these reports is to guide industry towards safer operation through elucidation of the immediate and underlying cause of the reported accidents. A review of the causes of these accidents shows that the vast majority could have been easily prevented by proper application of existing experience and dissemination of knowledge.

Lessons learned from these accidents are grouped in five categories:

1. Design/construction — related lessons learned;
2. Operation/maintenance — lessons learned;
3. Lessons learned from handling emergencies;
4. Lessons learned from mobilization after an emergency;
5. Specific lessons learned by specific chemical: acetic acid, NH_3, Cl_2, HF, H_2O_2, phosgene, P, H_2SO_4, etc.

A review of the reported accidents led to the following conclusions:

1. Almost 2/3 of the accidents resulted in the release of dangerous substances.
2. Main process units are more often involved in accidents but the number of accidents in isolated storage accidents is also significant.
3. Almost 1/3 of the accidents occurred during maintenance, loading/unloading, transfer, startup, shutdown and other non-standard operations.
4. Very commonly used substances (i.e., flammable gases and liquids, Cl_2, NH_3, H_2) are most often involved in accidents.
5. The vast majority of the accidents reported could have been easily prevented by proper application of existing experience and dissemination of knowledge.
6. Management/organizational omissions could be identified among the causative factors in approximately 90% of the accidents of which the causes were known.
7. Post-accident design modifications and improvements were suggested.