

CLA). Data given included chemical class, CAS number, hazard and behavior in water.

What I thought would be the heart of the book: (1) facilities spill prevention, practices, and (2) preventive engineering practices was limited to approximately 20 pages. It was not that the right concepts are not covered within these 20 pages; it is just that those topics are not covered in enough detail. I wished for much more.

The book ends with a long (70 pages) appendix, describing fixed facilities, chemical process equipment components, such as pumps, valves, piping heat exchangers, etc. Just why the author included a description of commonly used process equipment is not clear to me at all. It is really a very common material.

In summary, a great title, but inside great disappointment with many unfulfilled expectations.

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*Toxic Waste Minimization in The Printed Circuit Board Industry*, by T. Nunno, S. Palmer, M. Arienti and M. Breton, Noyes Data Corp., Park Ridge, NJ, 1989, ISBN 0-8155-1183-3, 162 pp., US \$39.

In support of the mandates found in the 1984 Hazardous and Solid Waste Amendments (HWSA) to the Resource Conservation and Recovery Act, the U.S. Environmental Protection Agency is evaluating the future of landfilling of many hazardous waste streams. The potential treatment or detoxication of those streams that will be allowed to be landfilled is discussed as well as the potential for onsite waste minimization.

The book is the result of U.S. EPA's study (really a contractor's study) of the waste generation practices of the printed circuit board industry, a growth-oriented industry that ranks in the top 20 industries generating solvent wastes.

There are six case studies in the book of the two largest circuit board industry waste streams: (1) sludges from electroplating operations, and (2) spent halogenated solvents (CFCs) and still bottoms from the recovery of these solvents. Each case study used the results of analytical methods to evaluate the performance of each methodology and to measure process residuals and other discharges. Finally, an assessment of the economics of each technology is also given to assist the cost evaluation comparisons.

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