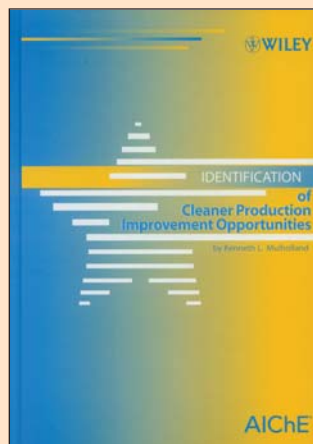


Identification of Cleaner Production Improvement Opportunities

Kenneth L. Mulholland, AIChE and John Wiley & Sons, Inc., 200 pages, \$59.95, Feb. 2006, ISBN-10: 0-471-79440-6



Approximately 15 years ago, I stated that "pollution prevention is the environmental management option of the next century." I believed this then, and I still believe it today. Increasing numbers of engineers, technicians and maintenance personnel are being confronted with problems in this most important area (e.g., reduce waste generation and the resources required to manufacture a product, while increasing company revenues).

Since a "preventative" approach to environmental management is a relatively new concept, the environmental engineers of today and tomorrow must develop a proficiency and an improved understanding of not only waste treatment, but of pollution-prevention techniques, in order to cope with the challenges and changes that must be handled.

Mulholland's new book supports the above argument.

Don't be deceived by the title — this is a book about pollution prevention, and is one of the few that deals with the technical and engineering aspects of this application.

Written in an easy-to-read manner, the book consists of five sections (or chapters) covering:

I. the relationships among cleaner production, waste, cleaner production analyses, and their business values

II. waste stream selection (how to develop a cleaner production program)

III. preparation for opportunity identification (data requirements and data analyses for the opportunity identification step)

IV. identification of process improvement opportunities

V. opportunity evaluation and final reporting (methodology to assess and rank the best ideas).

The primary audience for this text is practicing engineers and engineering/science students, and those who seek engineering practice information on pollution prevention. As an educator who has taught pollution prevention for many years, I particularly liked the first two chapters of the book. Here, the author details how to establish a framework for evaluating clean-production opportunities.

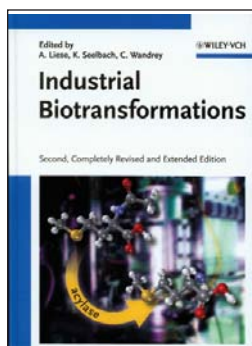
Educators will have a field day with some of the material in the Appendix — a section that comprises more than half of this 200-page book and includes a variety of instructional forms and handouts (e.g., waste-stream characterization, problem-definition, and process flowsheets, and report outlines). And, practicing engineers will appreciate the how-to approach (from a process perspective) of the material presented.

I believe this book is intended primarily for practicing engineers and engineering/science students. Is it worthwhile for CEP's audience to consider reading it? Definitely.

Mulholland's book is an essential piece of literature for any engineer who is interested in learning about and obtaining a better understanding of the preferred approaches to environmental management in the future — particularly if he/she is coming from the process side of environmental issues.

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Industrial Biotransformations, Second Edition

Edited by A. Liese, K. Seelbach and C. Wandrey, Feb. 2006, AIChE and John Wiley & Sons, Inc., \$149, 556 pages, ISBN-10: 3-527-31001-0

It's been more than five years since the first edition of *Industrial Biotransformations* was published. During this time, many examples of biotransformation have become

industrially relevant, while others have lost importance. For this second edition, every chapter has been rewritten, with each process updated and over 30 new ones added.

Drawing from extensive literature and patent research, this book covers each process in a systematic way to allow for easy comparison. Its extensive index is classified by substrates, products, enzymes and companies to provide direct

access to each process, organized according to enzyme class. Every set of data is accompanied by key literature citations, supported by flowsheets where available, reduced to their significant elements.

Biotechnologists, biochemists, microbiologists, process engineers and those working in the chemical and biotechnological industries will find here all the significant parameters characterizing both the biotransformation and the process. To this end, a section is dedicated to retrosynthetic biocatalysis, which draws from classical organic chemistry, where a complex chemical structure is reduced to building blocks that might be commercially available (e.g., ketones, amines, carbohydrates). The "Optimization of Industrial Enzymes by Molecular Engineering" section thoroughly discusses various biotransformation technologies, including enzyme production using bacterial expression hosts, improvements to enzymes by molecular engineering techniques, directed evolution, random mutagenesis methods, and identification of improved enzyme variants.