

which is presented in a manner suitable for beginners with only a rudimentary understanding of chemistry, then expands upon this treatment at a level that would be suitable for most advanced experts in areas relating to ignition of fires and explosions. For each topic covered, this book thoroughly presents the relevant underlying science, then uses this science to explore the strengths and weaknesses of typical applications such as regulatory requirements and test methods.”

The author notes that the “. . . handbook contains much material dealing with theory or mathematical aspects of fire.” Though “. . . of importance to fire science and fire engineering specialists. . .,” they “. . . will not be of main interest to fire investigators.” Thus, Babrauskas organized the book so that “. . . schooling in mathematics or science is not necessary in order to obtain practical guidance.” Moreover, the mathematical analyses are not exhaustive with references to the source of the derivations being given for those who want to delve more deeply into the topic.

The book has 15 extensive, well-written and well-documented chapters whose titles are: (1) Introduction, (2) Terminology, (3) Fundamentals of Combustion, (4) Ignition of Gases and Vapors, (5) Ignition of Dust Clouds, (6) Ignition of Liquids, (7) Ignition of Common Solids, (8) Ignition of Elements, (9) Self-heating, (10) Explosives, Pyrotechnics and Reactive Substances, (11) Characteristics of External Ignition Sources, (12) Preventive Measures, (13) Special Topics, (14) Information on Specific Materials and Devices, and (15) Tables.

A comprehensive review of such a mammoth book is not possible. Moreover, this reviewer is not an expert in the fire science area. But, I am an author and can evaluate the writing and effort that went into writing this book. That task was impressive in scope.

Examine these statistics: 1124 pages, 8.5 in. × 11 in. in size, almost 500 tables, over 600 figures, and approximately 5000 references, all of which appear to have been cited in the text.

I do not recall having seen (in recent years) a book of such magnitude.

At the very least, the book is comprehensive.

Additionally, the book is accompanied by a CD entitled “Ignition Handbook Data Base.” Included are five Quatro-pro spread sheets containing data on chemicals, solids, dusts, etc.

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Phytoremediation: Transformation and Control of Contaminants

Steven C. McCutcheon and Jerald L. Schnoor (Eds.); Wiley/Interscience, Hoboken, NJ, 2003, 1015 pages, ISBN: 0-471-39435-1, US\$ 115.00

In the initial chapter, McCutcheon and Schnoor write:

“Phytoremediation is evolving into a cost-effective means of managing wastes, especially excess petroleum hydrocarbons, polycyclic aromatic hydrocarbons, explosives, organic matter, and nutrients. Applications are being tested for cleaning up contaminated soil, water, and air. A number of important botanical processes have been discovered, including phytoextraction and hyperaccumulation from soil, plant-assisted microbial degradation of hydrocarbons in soil, use of specific enzymatic processes involved in created wetland treatment, and several other means of transforming and sequestering organic pollutants. Plant metabolism using sunlight energy and atmospheric carbon dioxide to produce organic matter is fundamentally different from heterotrophic microbial respiration requiring energy, carbon, and nutrients from soil or water. As a result, green plant transformation, conjugation, and sequestration are vital new tools in waste management that are categorized along with methods of vegetative control of pollutants to manage contaminated groundwater plumes and soil.”

And, indeed, it has, as it “. . . involves the use of vascular plants, algae, and fungi either to remove and control wastes or to spur waste breakdown by microorganisms in the rhizosphere.”

As editor of the Journal of Hazardous Materials, I began to receive papers on phytoremediation just in the last few years. It has become a very popular topic. While reviewing this book, I used the search word “phytoremediation” on Science Direct for the 1994–2003 period. The search engine showed 620 citations for phytoremediation. This large number is an indication of the increasing popularity of the technique.

Returning to the editors’ own view of the book’s coverage, I quote from the preface:

“This book covers phytotransformation, phytodegradation, rhizosphere degradation, and phytocontainment of xenobiotic organic pollutants and select inorganic compounds that plant enzymatic processes transform or mineralize.”

They continue later in the preface to say:

“To broadly cover the latest advances from fundamental investigation to field testing of concepts, seven sections are the basis for organization for this book hytoremediation. Each section starts with fundamental contributions that define the state-of-the-science and ends with chapters on the applications of fundamental and heuristic concepts in practical settings.”

It is noted that all chapters (even the initial chapter by the editors) were peer reviewed. The 80 plus contributors are broadly drawn from universities, government agencies (USGS, USEPA, US Army Corps of Engineers, USDA, etc.), consulting firms, and foreign laboratories (Japan, Germany, Denmark, Italy, Switzerland and Czech Republic).

The section titles are found below with the number of chapters (papers) in each section listed in parentheses:

- Section 1: Overview of science and applications (3).
- Section 2: Fundamentals of phytotransformation and control of contaminants (5).
- Section 3: Science and practice for aromatic, phenolic, and hydrocarbon contaminants (3).
- Section 4: Transformation and control of explosives (4).
- Section 5: Fate and control of chlorinated solvents and other halogenated compounds (5).
- Section 6: Modeling, design, and field pilot testing (5).
- Section 7: Latest advances (7).

A review of the titles of the papers in the book reveals a plethora of contaminants susceptible to phytobiodegradation: heavy metals (Pb, Cu, Fe, Cd, Hg, etc.), phenols, chlorinated solvents, MTBE, explosives, oil field brines, petroleum hydrocarbons, DDT, and atrazine. The benefits of phytoremediation are summed up in the paper dealing with MTBE: “phytoremediation provides an inexpensive, esthetically pleasing, and effective alternative for treating numerous organic contaminants”.

In my opinion, this is an excellent, comprehensive, well-reviewed and written text on the topic that will be consulted for many years to come by researchers in the field.

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Environmental Compliance Made Easy, Second Edition

Andre R. Cooper Sr., Government Institutes, Rockville, MD, 2003, 440 pp., US\$ 95.00, 8.5 × 11 Soft Cover Format, ISBN 0-86587-952-4

Making compliance with US environmental laws may not be easy (as indicated by the title of this book), but at the very least, use of the material in this book will lessen the industrial environmental engineer’s task of complying with the numerous laws and almost infinite number of pages of regulations promulgated by government agencies.

This book is:

Intended as both a beginner’s guide and as a veteran’s reference, the second edition provides readers with a concise summary of the major environmental programs. The author introduces readers to the programs, laws, and regulations that support the programs; key requirements of these laws and regulations; responsibilities of regulated parties; compliance and auditing processes; and contact information.

Readers will emerge with the fundamental understanding of which environmental management programs they should consider and how to implement them when de-

veloping proactive, successful, and reliable regulatory compliance programs. Key compliance sections include applicable methods, strategies for reviewing compliance status and implementing environmental programs, and checklists based on actual agency protocols. Readers can use the checklists to complete portions of their company’s overall compliance program.

Environmental Compliance Made Easy includes a new section on Homeland Security and Emergency Response as well as new sections on Compliance Audits, Environmental Management Systems, Information Technology Initiatives and Innovation, Pesticide Management, Property Transfer and Due Diligence, Solid Waste Management, Toxic Substance Management, Training, and Water Quality Management.

I turned to the chapter on Homeland Security and Emergency Response because it was new (as indicated above) as well as my personal interest in the topic. Following the title was this brief introductory comment:

Homeland security is a concerted national effort to prevent terrorist attack within the United States, reduce America’s vulnerability to terrorism, and minimize the damage and recover from attacks that do occur.

The National Strategy for Homeland Security aligns and focuses homeland security functions into six critical mission areas: (1) intelligence and warning, (2) border and transportation security, (3) domestic counter-terrorism, (4) protecting critical infrastructure, (5) defending against catastrophic terrorism, and (6) emergency preparedness and response.

Notable in this section (in common with the other sections in the book) are numerous Checklists. Indeed, in my opinion, it is these Checklists that make the book so valuable.

To say the least, the coverage of US environmental laws in this book is comprehensive. The 21 chapters are as follows:

1. Environmental Compliance Overview
2. Suite of Environmental Laws
3. Compliance Audits
4. Air Quality Management
5. Environmental Management Systems
6. Hazardous Materials Management
7. Hazardous Waste Management
8. Impact Assessments
9. Impact Assessments
10. Information Technology Initiatives and Innovation
11. Multimedia
12. Public Participation and Partnerships
13. Pesticide Management
14. Property Transfers and Due Diligence
15. Solid waste Management
16. Special and Cultural Resource Management
17. Toxic Substance Management