

Book reviews

Explosion Hazards in the Process Industries, R.K. Eckhoff. Gulf Publishing Company, Houston, TX (2005). 451 pp., US\$ 125.00, ISBN: 0-9765113-4-7

Recent readers of this journal have been provided with papers discussing, in the main, environmental topics. Papers discussing chemical hazards such as fire, explosion and spills, currently are in the minority. Such was not the case when the journal began (in the early days of the journal, I was the US editor), but with time, the paper supply in this area and the readers' interests led the journal to publish a preponderance of papers on environmental topics. Indeed, most of the books I review deal with this subject.

Thus, it is a pleasure to return to the journal's roots in publishing this review, although my expertise is not as deep in fire and explosion hazards as it is in chemical hazards/spills. That is not true of the author of this book.

Eckhoff has impeccable credentials in the topic area. His other book, *Dust Explosions in the Process Industry*, is now in its third edition, having originally appeared in 1991. Moreover, he teaches a course on explosive hazards in the process industries using this text.

This book has eight well-written and well-illustrated chapters with the following titles:

1. Introduction;
2. Gas and vapor cloud explosions;
3. Explosions in clouds of liquid droplets in air (spray/mist);
4. Gas and dust explosions caused by smoldering combustion in powder layers and deposits;
5. Dust explosions;
6. Explosives, pyrotechnics, and propellants;
7. Design of electrical apparatuses for hazardous areas;
8. Outline of methods for hazard and risk analysis.

A comprehensive review of the voluminous technical material in this book is beyond my capabilities, so I will focus on a limited number of topics of personal interest and prior knowledge: (1) there is a discussion of methane explosions in coal mines and the historical development of the coal mine lamp by Sir Humphrey Davy, (2) a thorough discussion of the Flixborough explosion in the UK in 1992 when the cyclohexane oxidation section of a caprolactam production plant exploded killing 28, injuring 89, demolishing the entire plant, and damaging 1821

houses and 167 shops and (3) case histories of numerous dust explosions are found in Chapter 5.

The discussion of the Flixborough accident is excellent as is the author's review of numerous other accidents such as the Beek explosion in The Netherlands in 1979, the Arendal explosion in Sweden in 1981, a methane explosion in British Columbia in 1982, and the "West Vanguard" explosion in the North Sea in 1985.

In Chapter 5, not only are the sources and impact of the explosion incidents well covered, but also Eckhoff included numerous photos of the aftermaths.

In summary, I found the book extremely interesting, very well-written, well-illustrated and informative but at the same time alarming as evidenced by the photographs of post-explosion analysis and review. This text should be required reading for anyone dealing with potentially explosive mixtures.

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Wastewater Sludge Processing, I.S. Turovskiy, P.K. Mathai. Wiley-Interscience, Hoboken, NJ (2006). Price US\$ 74.95, 366 pp., ISBN: 0-471-70054-1

As regulations tighten on wastewater discharges, new and more efficient treatment processes are being designed and built. The good news is that wastewater effluent quality is improved; the counterbalancing news is that a problem byproduct, i.e., sludge, is produced. The disposal, but more importantly the beneficial use of that byproduct is the focus of this book.

According to the authors, "The objective of this book is to bring together a wide body of knowledge from the field of wastewater sludge processing and present it in a format that is useful for a textbook for graduate students in environmental

engineering and as a reference book for practicing engineers.” In my opinion, the authors have met their goals superbly. The only thing lacking, and that is a minor criticism, is problems for potential student assignment. Their inclusion would have enhanced (not that the book needs much enhancement) the book’s use as a student text.

Let not that minor criticism dissuade you from acquiring book. It is the best-written, most comprehensive and well-illustrated text I have reviewed recently. The subject is covered well in the following chapters:

1. Introduction;
2. Sludge quantities and characteristics;
3. Thickening and dewatering;
4. Aerobic digestion;
5. Anaerobic digestion;
6. Alkaline stabilization;
7. Composting;
8. Thermal drying and incineration;
9. Comparison of energy consumption;
10. Beneficial use of biosolids.

As I read the book, I made a list of aspects that impressed me. They are as follows:

- Much data are provided on sludge processing systems;
- Foreign treatment systems are discussed and data provided (the senior author is Russian and there are numerous references to the Russian literature);
- Provision of numerous worked examples of process calculations;
- Thorough coverage of the topic (I was surprised, but pleased, to even see a reference to sludge treatment in my home city of Toledo, Ohio, where I was privileged to help develop the Cement Kiln Dust sludge treatment system).

In conclusion, I reiterate my admiration for the writers’ thorough coverage of the topic. Unlike many books, the authors did not digress into a host of unrelated material. They stuck to the topic.

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Industrial Hygiene Simplified: A Guide to Anticipation, Recognition, Evaluation and Control of Workplace Hazards, F.R. Spellman. Government Institutes/Scarecrow Press, Lanham, MD (2006). 363 pp., Price: US\$ 99.00, 8.5 × 11 soft cover, ISBN: 0-86587-019-2

Spellman begins this book with the following statement:

“According to the Occupational Safety and Health Administration (OSHA), industrial hygiene is the science of anticipating, recognizing, evaluating, and controlling workplace conditions that may cause workers injury or illness. Industrial hygienists use environmental monitoring and analytical methods to detect the extent of worker exposure. They also evaluate employee engineering, administrative controls, and other methods, such as personal protective equipment (PPE), designed to control or guard against potential health hazards in the workplace.”

This book will be a tremendous asset to those professionals given the foregoing task. It is written by a well published author (I found at least four citations to his prior books in the references).

On the back cover, the publisher notes that the book is “. . . a straightforward response to the need for a hands-on resource that focuses on modern industrial hygiene practice. It is intended for in-field use, corporate training settings, and for those involved in such disciplines as industrial technology, manufacturing technology, industrial engineering, engineering technology, occupational safety, management, and supervision.”

In the body of the book, the reader will find the following well-written chapters.

1. What is industrial hygiene?
2. Industrial hygiene/safety terminology
3. Hazard communication, occupational environmental limits, and air monitoring and sampling
4. Indoor air quality and mold control
5. Noise and vibration
6. Radiation
7. Thermal stress
8. Ventilation
9. Personal protective equipment
10. Toxicology: biological and chemical hazards
11. Ergonomics
12. Engineering design and controls

The writing is clear, definitions are supplied when needed, and equations are supplied for calculations when appropriate. Reference lists and suggested reading are found at the end of each chapter.

Readers new to the field will be well-served by the information in Chapter 2 which is entitled “Industrial Hygiene/Safety Terminology.” That chapter contains more than 20 pages of definitions of terms.