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Book reviews

The Microbiology of Anaerobic Digesters
Michael H. Gerardi, Wiley, Somerset, NJ, 2003, 186 pp., US$ 49.95 (Paperback), ISBN 0-471-20693-8

Anaerobic digesters are commonly found at municipal wastewater treatment plants where they are employed in treating sludge to stabilize its organic content and produce methane. The methane gas is often burned to produce heat for the digesters themselves or is combusted in engines to supply power to the plant's air compressors. In recent years, anaerobic processes have been used increasingly to treat high strength industrial wastes; these processes often involve the use of fixed film reactors which are described in the last section of the book.

This book is the third in a series by Gerardi. His other two books were entitled: (1) *Nitrification and Denitrification in the Activated Sludge Process* and (2) *Settleability Problems and Loss of Solids in the Activated Sludge Process*. This book was prepared for operators and technicians who deal daily with digesters. It presents information on troubleshooting and process control measures to reduce operational costs, maintain treatment efficiency and prevent system control upsets.

The book has 24 relatively short chapters divided into five major sections:

1. Overview.
2. Substrates, products and biogas.
3. Operational conditions.
4. Process control and troubleshooting.
5. Digesters.

The information provided in the book is quite basic but it clearly describes the anaerobic process and the fundamentals that underlie it: type of bacteria and their role is described in Chapter 1, while Chapters 2 and 3 focus upon methane-forming bacteria.

The author includes numerous diagrams and figures to illustrate his points. Mathematical analysis is not employed.

Although numerous references are found in a separate section at the end of the book, no reference citations are found in the text. This omission, in my opinion, is a weakness. But, that criticism aside, I found the book easy-to-follow and descriptive of the anaerobic system/process.

Gary F. Bennett

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MDI & TDI safety, health and the environment—a source book and practical guide
Dennis C. Allport, David S. Gilbert, Susan M. Outterside (Eds.), Wiley, Somerset, NJ, 2003, 457 pp., US$ 130.00, ISBN: 0-471-95812-3

Edited by a member of the Gilbert International Limited, Manchester, UK, this book, sponsored by the International Isocyanate Institute, focuses on the handling aspects of methylenediphenyl diisocyanate (MDI) and toluene diisocyanate (TDI) which are produced at a rate of approximately four million tonnes per year. These chemicals are used in a wide range of processes to produce an almost endless range of polyurethane and other products. This book focuses on "the safety, health and environmental problems that arise during the handling of MDI and TDI and how to prevent them."

The book has five long chapters, the details of which are noted below:

1. *MDI and TDI and the polyurethane industry*: Discussed are the various commercial forms of MDI and TDI and the commercial structures of their component isomers. The production and usage of polyurethane is reviewed.
2. *Handling MDI and TDI*: Safe handling of TDI and MDI is the key message in this chapter. Discussed are the health effects of these two chemicals, protective measures, spill handling (neutralization, decontamination and disposal of waste), personal protective equipment (including a detailed review of breathing apparatii), and how to deal with accidents (spills and fires). Transport by all modes (from cans to ships) is reviewed as are transport regulations, and description of typical containers (railcars, road tankers, and inter-modal tank containers). Workplace safety is emphasized with a discussion of exposure to MDI and TDI. Near the end of the chapter, the book discusses abatement of industrial releases through adsorption on activated carbon and aqueous scrubbing.
3. *Health*: The authors summarize this chapter thusly: "Health aspects of MDI and TDI have been subject to intensive research, in terms of both human and animal toxicological studies. It has even been suggested that TDI has been subject to more intensive study than any other chemical. One important reason is that diisocyanates may cause asthma in sensitive individuals at extremely low concentrations. MDI and TDI are included in diverse regulatory listings of dangerous chemicals because of this factor. Asthma is a major component of occupational