

Book review

Control of Volatile Organic Compound Emissions: Conventional and Emerging Technologies

P. Hunter, S.T. Oyama (Eds.), Wiley/Interscience, New York, USA, 2000, 290 pp., US\$ 89.95, ISBN: 0-471-33369-7

This book addresses a major environmental problem—the control of emissions of volatile organic compounds from industrial processes. This class of chemicals includes a broad range of odorous and toxic substances that includes hydrocarbons, olefins, aromatic and various oxygen- nitrogen-, sulfur- and halogen-containing molecules.

The first two chapters are, as is common with most texts, very general. Chapter 1, setting the stage for the book, describes generally the problem posed by VOCs as ambient indoor and odorous pollutants. Chapter 2 briefly reviews current available control technology (almost as a summary for the rest of the book). This introductory review is followed by a more complete discussion of each technology in subsequent chapters devoted to the following.

- Condensation.
- Adsorption.
- Absorption.
- Thermal incineration.
- Flaring.
- Catalytic incineration.
- Biodegradation.
- Emerging technologies.
- Ozone properties, handling, and production.
- Surface reactions and catalysis.

Each chapter follows approximately the same format.

- Technology description.
- System design.
- Economic estimates.
- Potential problems.
- Installation, operation, and maintenance considerations.
- References.

The economic estimates are very well done, being based on several chapters on the work of Vatavuk. Theory, although discussed, was not as detailed as I would have liked. Lacking were worked examples of the equations presented. A full-scale example of design of each

system would have been useful. Extensive references are given at the end of each chapter. Missing, however, are real-world industrial process descriptions with performance data.

The need for better and cheaper destruction of VOCs has driven the development of new methods of VOC elimination. New methods are discussed under the heading of Emerging Technologies in Chapter 10. These include the following.

- Membrane separation.
- Ambient oxidation process.
- Corona destruction.
- Plasma destruction.

In the final two chapters, the potential application of ozone to destroy VOCs is developed. Chapter 11 is a general chapter discussing ozone properties, handling and production (including cost data) [the chapter is resplendent with references, numbering 259]. The general discussion is followed by a very technical study (Chapter 12) discussing Surface Reactions and Catalysis (including reactions with carbon).

The book ends with the following two appendices.

- Internet Links to International Efforts in Pollution Prevention.
- Pollutants Regulated Under the Clean Air Act Amendments.

In conclusion, I find this book dealing with a single pollutant refreshing, focused and well-written.

G.F. Bennett