

respiratory disease in many industrialized countries, and diisocyanates (including aliphatic diisocyanates) have been implicated in a significant percentage of cases.” “The first part of this text deals with the results of human experience, commencing with a commentary on first aid. The second part of the text deals with experimental toxicology, and the relationships between the results of these studies. Finally, there are appendices that give a practical scheme for the diagnosis of diisocyanate asthma and a medical survey form which has been used with diisocyanate workers. No attempt has been made to be comprehensive in recording all the available literature, as it is so extensive.”

4. *The environment*: The central theme of this chapter is a discussion of environmental risk assessment. Exposure, hazard (ecotoxicity), and risk assessment are section titles. The good news found in the aforementioned sections is that: releases of MDI and TDI to the environment are low, they have low volatility and solubility and are not persistent (being easily degraded), they have low environmental toxicity and present little environmental risk.
5. *Supporting sciences*: This section was written mainly for experts and those involved in detailed regulatory submissions. Chapter sections include the chemistry of manufacture of MDI and TDI, structure and nomenclature, chemical reactions, physical and fire properties, fire behavior, occupational exposure, and sampling and analysis.

Before ending this review, I must note two impressive factors of the book: (1) all the tables and many of the important conclusions are highlighted in light green; as a result they are very visible; and (2) there are a large number of excellent photographs and diagrams, I was especially impressed by those diagrams that showed the details of breathing apparatus.

I am far from an expert on the topic of these two chemicals, but I am much better informed on this topic after having reviewed this book. In my opinion, this book is a superb contribution to the literature.

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New Insights into Membrane Science and Technology: Polymeric and Biofunctional Membranes

D. Bhattacharyya, D.A. Butterfield (Eds.), Elsevier, Amsterdam, 2003, 500 pp., Price US\$ 210.00; EUR\$ 210.00, ISBN 0-444-51175-X

This book, the eighth in Elsevier's Membrane Science and Technology Series, contains 19 well-written review papers

that describe both the theoretical and practical aspects of membrane theory and applications. The papers are mainly from the 2001 North American Membrane Science Annual Meeting.

The editors note that “membrane techniques provide a broad science and technology base with applications ranging from water purification to chemical/biomolecule synthesis, material recovery, medical devices to nano-domain interaction-based sensors and highly selective separations.”

While readers of this section of the Journal will be most interested in the environmental use of membranes (as I am), this book expands our horizons beginning with a fundamental discussion of “mass transfer in axial flows through randomly packed fiber bundles.” Also covered are topics ranging from membrane transport models to non-invasive characterization, functionalized material, biomedical devices to sensors, and environmental applications.

Three papers focus on environmental applications. The first paper in this section is entitled “Industrial Applications and Opportunities for Membrane Contactors.” In this paper, the authors discuss several new uses for membrane systems: (1) membrane gas absorption for removal of components from a gas stream when a suitable absorption fluid is available; treating ammonia and carbon dioxide streams is discussed, (2) pertraction; this process is a non-dispersive membrane-based liquid–liquid extraction that can remove aromatics or chlorinated hydrocarbons from a waste stream, and (3) membrane stripping which is the removal of gases, especially oxygen, from water; this is a process important in the microelectronic industry.

The second paper in this section discusses recent developments in membrane contactors: liquid–gas, liquid–liquid, supercritical fluid-based, and adsorption-based contactors. The chapter also includes a section on the use of contactors as reactors.

The last paper is entitled “Membrane Aromatic Recovery System (MARS)—A new process for recovering phenols and aromatic amines from aqueous streams.” The authors address the problem of purifying wastewater containing phenols and related compounds (such as aniline). Process economics also are presented.

Given that several of the authors were non-English speaking, the papers are very well written. The editors are to be congratulated on this aspect as well as their work in assembling an excellent series of membrane-oriented papers that reviews developments in this rapidly evolving field.

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