

Book reviews

A Comprehensive Guide to the Hazardous Properties of Chemical Substances, P. Patnaik., 3rd ed., John Wiley & Sons Inc., Hoboken, NJ (2007). 1083 pp., Price: US\$ 175.00, ISBN: 978-0-471-71458-3

In the Preface to the first edition of this book, the author writes that his objective was to present information on many aspects of the hazardous properties of chemicals. His goal also was to correlate the hazardous properties of compounds to functional groups, reactive sites, and other structural features in the molecules with the goal of predicting or assessing the hazards of a compound from its structure where there is a lack of experimental data.

“The hazardous properties are classified under two broad headings: health hazard and fire and explosion hazard. The former includes toxicity, corrosivity, carcinogenicity, mutagenicity, reproductive toxicity and exposure limits. Flammability, violent and explosive reactions, incompatibility and fire-extinguishing agents are discussed under fire and explosion hazard. In addition, information is provided on physical properties, uses, storage, handling, disposal/destruction, and chemical analyses.”

“Individual compounds in each class of substance are discussed in most Chapters under the following features: formula; molecular weight; CAS registry number; EPA (RCRA) and DOT status; structure; synonyms; uses and exposure risk; physical properties, including color, odor, melting and boiling points, density (mg/L), solubility and pH (if acid or alkaline); health hazard which includes toxic, corrosive, carcinogenic, teratogenic properties; exposure limits set by ACGIH, OSHA, MSHA, and NIOSH; fire and explosion hazard, which includes flammability data, fire-extinguishing agents, and explosive reactions; storage and shipping; disposal/destruction, including laboratory methods for destruction and biodegradation; and chemical analyses . . .”

This edition has two major sections labeled Part A and Part B. Part A has 13 chapters listed below:

1. Introduction
2. Glossary
3. Physical properties of compounds and hazardous characteristics

4. Toxic properties of chemical substances
5. Target organs and toxicology
6. Cancer-causing chemicals
7. Teratogenic substances
8. Habit-forming addicting substances
9. Flammable and combustible properties of chemical substances
10. Explosive characteristics of chemical substances
11. Peroxide-forming substances
12. Chemical warfare agents
13. Biological warfare agents and bioterrorism

The reader will note that new material has been added to address the chemical and biological threats of terrorist actions.

Part B has 57 separate chapters which are based on chemical structure. A sample of the chapters includes material on acids, carboxylic; acids mineral; acids peroxy; alcohols; aldehydes . . . sulfur containing organics (miscellaneous).

The book ends with five appendices entitled: (A) Federal Regulations: RCRA, Priority Pollutant List, CWA, SDWA, CAA, and TSCA; (B) IARC List of Carcinogenic Agents (2006 update); (C) NTP List of Carcinogens (2004) 11th Annual Report; (D) Chemical Substances—CAS Registry Number Index; and (E) CAS Registry Number—Chemical Substances Index.

Given the amount of information provided in this book, I believe that it will be a valuable resource to scientists as well as to laymen interested in chemicals, their properties and their hazards.

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