

**HANDBOOK OF TOXIC
AND HAZARDOUS
CHEMICALS**

by

Marshall Sittig

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Foreword

This handbook presents concise chemical, health and safety information on nearly 600 toxic and hazardous chemicals, so that responsible decisions can be made by chemical manufacturers, safety equipment producers, toxicologists, industrial safety engineers, waste disposal operators, health care professionals, and the many others who may have contact with or interest in these chemicals due to their own or third party exposure.

Included in the book are *all* of the substances whose allowable concentrations in workplace air are adopted or proposed by the American Conference of Governmental Industrial Hygienists (ACGIH), *all* of the substances considered to date in the Standards Completion Program of the National Institute of Occupational Safety and Health (NIOSH), *all* of the priority toxic water pollutants defined by the U.S. Environmental Protection Agency (EPA), and *most* of the chemicals in the following classifications: EPA "hazardous wastes," EPA "hazardous substances," chemicals reviewed by EPA in Chemical Hazard Information Profiles (CHIPS) documents; and chemicals reviewed in NIOSH Information Profile documents.

The necessity for informed handling and controlled disposal of hazardous and toxic materials has been spotlighted over and over in recent days as news of fires and explosions at factories and waste sites and groundwater contamination near dump sites has been widely publicized. In late 1980 the EPA imposed long-delayed regulations governing the handling of hazardous wastes—from creation to disposal. Prerequisite to control of hazardous substances, however, is knowledge of the extent of possible danger and toxic effects posed by any particular chemical. This book provides the prerequisites.

The chemicals are presented alphabetically and each is classified as a "carcinogen," "hazardous substance," "hazardous waste," and/or a "priority toxic pollutant"—as defined by the various federal agencies, and explained in the comprehensive Introduction to the book.

Data is furnished, to the extent currently available, on any or all of these important categories:

Chemical Description	Routes of Entry
Code Numbers	Harmful Effects and Symptoms
DOT Designation	Points of Attack
Synonyms	Medical Surveillance
Potential Exposure	First Aid
Incompatibilities	Personal Protective Methods
Permissible Exposure Limits in Air	Respirator Selection
Determination in Air	Disposal Method Suggested
Permissible Concentration in Water	References
Determination in Water	

Essentially the book attempts to answer six questions about each compound (to the extent information is available):

- (1) What is it?
- (2) Where do you encounter it?
- (3) How much can one tolerate?
- (4) How does one measure it?
- (5) What are its harmful effects?
- (6) How does one protect against it?

An outstanding and noteworthy feature of this book is the Index of Carcinogens.

This book will thus be a valuable addition to industrial and medical libraries.

Advanced composition and production methods developed by Noyes Data are employed to bring these durably bound books to you in a minimum of time. Special techniques are used to close the gap between "manuscript" and "completed book." Industrial technology is progressing so rapidly that time-honored, conventional typesetting, binding and shipping methods are no longer suitable. We have bypassed the delays in the conventional book publishing cycle and provide the user with an effective and convenient means of reviewing up-to-date information in depth.

The alphabetical table of contents serves as a subject index and provides easy access to the information contained in the book.

ABOUT THE AUTHOR

Marshall Sittig, a chemical engineer, is President and Managing Director of Sittig & Noyes, International Chemical and Process Industries Consultants, and was formerly with E.I. Du Pont de Nemours & Co., Inc. in chemicals manufacturing, Ethyl Corporation in liaison between research and sales, and Princeton University as Director of Governmental Relations.

Preface

Last April an explosive fire broke out at an abandoned chemical dump site in Elizabeth, New Jersey. When thousands of barrels containing unidentified toxic waste erupted in flames, an ominous black cloud filled the sky and no one knew for sure whether lethal fumes would jeopardize the surrounding area—one of America's most densely populated. Fortunately, nobody was hurt seriously, perhaps in part because more than 500 pounds of such dangerous agents as nitroglycerine, picric acid and mustard gas were removed prior to the fire by the state environmental protection personnel.

That near-disaster gave the nation fresh evidence of the urgent need to control the disposal of toxic wastes. In New Jersey alone, there are 233 potentially dangerous toxic waste sites, according to a study in 1979 by my staff and the New Jersey Department of Environmental Protection. And the federal Environmental Protection Agency estimates there are between 1,200 and 2,000 hazardous sites nationally, including many which threaten water supplies.

One reason for the severity of this problem is that it has only recently risen to public consciousness, and years of uncontrolled dumping has taken its toll. But incidents such as the fire at Elizabeth and the contamination of the Love Canal area in New York brought the issue national attention and forced public officials, scientists, and representatives of industry to consider its implications.

The most obvious are the potential effects on national health and the environment. Although the link is poorly understood, there is evidence that many of these chemicals can cause cancer. Just as frightening is the possibility of acute toxic effects such as brain and nerve damage, sterility, and birth defects.

In response to these concerns, Congress has initiated numerous legislative and regulatory measures. I was a strong supporter of the recently enacted Superfund legislation creating a fund to clean up existing dangerous waste disposal sites and deal with emergency situations in the future. This was a major step forward in providing the funding needed to successfully attack the problem.

The intent of legislation such as this is not to unnecessarily restrict the use of chemicals. Modern society has come to depend on them for scientific and tech-

nological advancement as well as health, recreation, and many other benefits. But the increase in their production has led to large-scale use of some chemicals known to have adverse health effects and others whose effects, especially in the long run, are uncertain. The recent development of a vast number of chemicals has also added greatly to the difficulties of evaluating which chemicals to regulate and how to establish safeguards for their manufacture, use and disposal. Humans can be exposed to chemicals in many ways with results that can be immediate but years of research are often required to determine whether a particular substance is hazardous.

In addition to environmental concerns, dangerous levels of exposure which can threaten the health of workers must be prevented. Many workers die each year as a result of physical and chemical hazards at work, and the long-term effects of certain occupational conditions are unknown. Exposure to carcinogens in the workplace is believed to be a factor in more than 20% of all cases of cancer.

We must also be alert to the possibility that hazardous chemicals will seep into water supplies from waste dump sites across the nation. Last year a New Jersey township's water supply was contaminated for more than a year, causing great hardship. New federal regulations will curb dangerous disposal practices of toxic wastes.

Protecting against potential public health hazards requires widespread knowledge about commercial chemicals—their mixtures, by-products and uses. We need to know more about their persistence and fate in the environment, what effects they will have, and, most importantly, how we can minimize the risks posed by them.

For these reasons, Marshall Sittig's book is an important addition to the literature on toxic waste. It provides access to information contained in hundreds of government publications, with particular attention to the identification of carcinogenic materials. References at the end of many entries provide useful bibliographies listing thousands of original publications describing the effects of toxic chemicals on the environment. This comprehensive information makes it a valuable desk reference.

In short, Marshall Sittig has made it easier for us to understand how to control the disposal of toxic wastes. My hope is that this understanding will produce more effective action.

Bill Bradley
United States Senator
New Jersey
January 1981

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