

**HANDBOOK OF
TOXIC AND HAZARDOUS
CHEMICALS AND
CARCINOGENS**

Second Edition

by

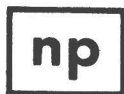
Marshall Sittig

HANDBOOK OF TOXIC AND HAZARDOUS CHEMICALS AND CARCINOGENS

Second Edition

Marshall Sittig

Princeton University



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Foreword

In April 1980, 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. 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 85 toxic waste sites on the Environmental Protection Agency's list of 546 worst sites identified so far, more than any other state. Of the 15 worst sites in the nation, 6 are in New Jersey.

Toxic wastes are an incredible problem in our country. They threaten our water, our air, and our lives. We must find better ways to handle toxic chemicals and dispose of our toxic wastes. Unfortunately, we have just begun to recognize the dangers posed by years of irresponsible disposal of wastes. And, too frequently our belated response has been to push pollution around from one place to another. When we recognized the danger of air pollution, we devised systems to prevent the discharge of particulates. The systems gathered soot and sludge, so we took that soot and sludge and dumped them in the ocean. When we became concerned about pollution in the ocean, we ordered the wastes buried in the ground. Now we have learned that what is buried in the ground can seep into and poison our drinking water. Our problems have only moved with each new form of disposal.

One reason for the severity of this problem is that it has only recently risen to public consciousness, and years of uncontrolled dumping have taken their 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 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 Superfund legislation is finally beginning to produce results. Hazardous waste sites are beginning to be cleaned up. In October, 1983 after much too long a wait, EPA awarded \$5 million to New Jersey to pay for most of the cost of re-locating Atlantic City's drinking water wells that are threatened by hazardous waste deposited at Price's Pit.

These remedies have often come with agonizing slowness. The intent of legislation such as Superfund is not to unnecessarily restrict the use of chemicals. Modern society has come to depend on them for scientific and technological 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 new 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.

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

For these reasons, Marshall Sittig's book is an important addition to the literature on toxic chemicals. 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 and hazardous chemicals on man and 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 handling of toxic chemicals and the disposal of toxic wastes. My hope is that this understanding will produce more effective action.

January 1985

Bill Bradley
United States Senator
New Jersey

Preface

This handbook presents concise chemical, health and safety information on nearly 800 toxic and hazardous chemicals (up from nearly 600 in the first edition) 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 **EPA Priority Toxic Pollutants**,
- all of the substances whose allowable concentrations in workplace air are adopted or proposed by **ACGIH (1983/1984)**,
- all of the substances considered to date in the Standards Completion Program of **NIOSH**, and
- most of the chemicals classified as EPA "hazardous wastes,"
- most of the chemicals classified as EPA "hazardous substances,"
- most of the chemicals reviewed in EPA "CHIPS" documents, and
- most of the chemicals reviewed in **NIOSH Information Profiles**.

In addition, this Second Edition includes:

- all of the carcinogens identified by the **U.S. National Toxicology Program**,
- many of the chemicals profiled by the **Dutch Association of Safety Experts**, the **Dutch Chemical Industry Association**, and the **Dutch Safety Institute**,
- most of the chemicals described in the **ILO Encyclopedia of Occupational Health and Safety (1983)**,
- most of the chemicals in the **United Nations' IRPTC Legal File (1984)**, and
- most of the chemicals described in the journal publication: *Dangerous Properties of Industrial Materials Report*.

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 1984 tragedy at **Bhopal, India** involving methyl isocyanate (see entry on page 609) may will stimulate the enactment of "right-to-know" legislation requiring that workers be furnished data akin to the entries in this volume on chemicals they encounter in the workplace.

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.

Particular attention is given in the second edition to delineation of the identity and properties of those chemicals now known to be carcinogens.

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 seven 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?
- (7) Where can I learn more?

Under category (7), "where can I learn more?" this second edition provides hundreds of new citations to secondary reference sources which in turn provide access to thousands of references on properties and toxicology and safe handling of all the compounds listed.

An outstanding and noteworthy feature of this book is the Index of Carcinogens. There were 92 listed in the first edition, 178 in the second edition.

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

Advanced composition and production methods developed by Noyes Publications 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.

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