

Book Reviews

Destruction and Disposal of PCBs by Thermal and Non-thermal Methods, by D.G. Ackerman, L.L. Scinto, P.S. Bakshi, R.G. Deumyea, R.J. Johnson, G. Richard, A.M. Takata and E.M. Sworzyn, Noyes Data Corporation, Park Ridge, NJ, 1983, 417 pages, \$48.00.

Two reports prepared by TRW Inc. of Redondo Beach, CA for the US EPA were combined to make this book:

- (1) "Guidelines for the Disposal of PCBs and PCB Items by Thermal Destruction" (US EPA Report 600/2-81-022).
- (2) "Interim Guidelines for the Disposal/Destruction of PCB and PCB Items By Non-thermal Methods" (US EPA Report 600/2-82-069).

In the thermal destruction section, the authors discuss PCB destruction in incinerators and high efficiency boilers; included topics are: (1) sampling and analysis methodologies, (2) analytical methodologies, and (3) stack monitoring instrumentation.

Non-thermal destruction processes discussed include conventional biological processes, such as activated sludge and trickling filters, as well as physico-chemical processes: (1) adsorption, (2) catalytic dehydrochlorination, (3) chlorinolysis, (4) microwave plasma, (5) ozonization, (6) photolysis, (7) glycoloxidation, (8) wet air oxidation, and (9) two named commercial processes: Goodyear and Sohio.

Although Noyes Data Corporation wanted to publish, I am sure, the complete reports, they could have saved 50 pages by not reprinting the Federal Register, PCB Regulations. Not only could the reader access them fairly easily, but if he wanted to consult them, he would have to find the original, because the regular pages (8½" × 11") have been reduced to 5" × 8" in the book, making the already small and difficult to read print almost impossible to see.

GARY F. BENNETT

Safety and Accident Prevention in Chemical Operations, 2nd edn., by H.H. Fawcett and W.S. Wood, John Wiley and Sons, New York, NY, 1982, 910 pages, \$80.00.

With the assistance of 26 experts in accident prevention and safety in chemical operations, Fawcett and Wood have produced a second edition of this book that has 38 chapters, 5 appendices and an index.

It is a thoroughly up-to-date, well-written and comprehensive text covering a wide variety of topics from "Risk Analysis" to "RCRA." It is extremely well-referenced. Fawcett for example in the lead off chapter entitled "Chem-

ical Health and Safety — Is Our Future Secure?” has well over 120 references. In another chapter he wrote, I was surprised to find 1982 citations — amazingly current for a book published late that year.

To give the reader of this review an idea of the scope of the text, I will cite some of the chapters:

1. On Laws:

- (a) OSHA — federal standards in occupational safety and health.
- (b) TSCA — the impact of TSCA on the practice of occupational medicine.
- (c) RCRA — chemical waste: new frontiers for the chemists and chemical engineers — RCRA and Superfund.

2. Personnel Safety:

- (a) Respiratory hazards and protection.
- (b) Eye safety in chemical operations.
- (c) Other personnel protective equipment.

3. Fires:

- (a) Cool flames.
- (b) Safe handling of flammable and combustible materials.
- (c) Fire extinguishing agents and their applications.
- (d) Fighting chemical fires with foam.
- (e) Fire and explosion investigations in chemical plants and oil refineries.

There are other chapters on: Hazards of Commercial Chemical Operations, Pressure Relief, Pressure Vessel Selection, Maintenance, Blast-resistant Building Design, Fault-tree Analysis and Loss Prevention.

I found the first appendix containing Data on Hazardous Chemicals to be most useful. Twenty items (if available) are given for each chemical: physical state, water solubility, specific gravity, vapor density, boiling point, flash point, ignition temperature, flammability limits (upper and lower), NFPA class, type of hazard, hazard ratios (health, flammability, reaction), life hazards (skin, oral, respiration), precautions, fire extinguishing methods and references.

I likely spent more time with this excellent book than with almost any other I have reviewed recently. Randomly selecting the chapters by author (if I knew him or her) or topics of interest, I rarely found myself disinterested or unrewarded of some new fascinating (and useful) data:

- 1. Fawcett must have a gigantic file, exceedingly well arranged. Who else could quote the *Wall Street Journal*, *C & E News*, *Washington Post*, HMSO Stationary Office, *Science*, NRC and *US News and World Report*, just to name a few in one chapter.
- 2. Chemicals causing cancer and their target organs.
- 3. Comparison of acceptable chemical levels in the work place in different countries (USA, BRD, DDR, Sweden, CSSR and USSR).
- 4. Hazards of laboratory chemicals.
- 5. Insurance losses in the chemical industry.
- 6. Symptoms of exposure to selected gases (CO, NH₃, SO₂ and H₂S).
- 7. List of waste exchanges.

8. Uncontrolled hazardous waste sites (Superfund) ranking method.
9. Loss prevention review checklist, 19 pages long.

GARY F. BENNETT

Chemical Hazards to Human Reproduction, by I.C.T. Nisbet and N.J. Karch, Noyes Data Corporation, Park Ridge, NJ, February 1983, 245 pages, \$28.00.

In this report commissioned by the US Government (Council of Environmental Quality for US EPA, NIOSH and OSHA), the authors have attempted to "research and include the extant scientific, medical and regulatory literature and documents that relate to the effects of chronic exposure to toxic chemicals and their consequences upon human and animal reproductive integrity".

Among the key findings that should enhance reader's interest are:

- Toxic chemicals can exert effects at many stages in male and female reproduction, but it does not follow that females are more sensitive than males to any given agent.
- Reproductive impairments of one kind or another are both frequent and widespread in the US. Published estimates of the proportion of reproductive attempts that fail or are impaired range from 30 to 80%.
- There is much evidence that drugs and other chemicals have had substantial adverse effects on reproduction in highly exposed groups.

The book has seven chapters, plus an extensive (40 page) bibliography and appendix. The chapters are:

1. Introduction.
2. The human reproduction system and its susceptibility to the toxic chemicals.
3. Sources of data on reproductive impairment in human populations.
4. Drugs and other chemicals reported to affect reproductive functions in humans.
5. Experimental assays for the effects of chemicals on reproduction.
6. Concordance between reported effects in humans and measured effects in animals.
7. Policy issues raised by this report.

The range and number of chemicals discussed was extensive. For example, ten agents, reported to have teratogenic effects in humans and animals included: anesthetic gases, smelter emissions (lead and arsenic), PCBs, alcohol, vinyl chloride, warfarin, diphenylhydantoin, aminopterin, bisulfan, methotrexate, and methyl mercury.

The last chapter is short, but contains some interesting questions, many of which must await more research before they can be satisfactorily answered:

- How important is reproductive impairment as a public health problem?