

BOOKS

Dangerous Properties of Industrial Materials by N. Irving Sax. Van Nostrand Reinhold, Fifth Edition, 1118 pages, \$54.50, April 1979.

The many regular users of Sax's classic "Dangerous Properties of Industrial Materials" will welcome this fifth edition which retains the general format of the fourth while increasing the listing of common industrial and laboratory materials from about 13,000 to about 16,000. Section 12, General Chemicals, comprising about 70% of the text volume, presents alphabetically and concisely general information on each material (synonyms, description, formula, and physical constants) followed by toxicity data, fire and explosion hazard analysis and counter measures. This section has much new information and for most materials provides bibliographical references to the supporting documents. These references, which had not been supplied previously, are a valuable addition.

The first eleven sections are generally approached as in previous editions (with in many cases the authors being the same as for the fourth edition). These sections collectively comprise about 30% of the total text volume. They are concise, contain a wealth of detail, and provide a fast introduction to many aspects of handling dangerous materials. A listing of the section headings will best outline the contents of these sections: 1. Historical Perspective; 2. Industrial Air Contaminant Control; 3. Industrial Noise: Effects and Controls; 4. Air Pollution Control Requirements for Industrial, Commercial and Public Facilities; 5A. Radiation Hazards; 5B. Large Radiation Sources Ap-

plications and Safeguards; 6. Health Hazards of Solid-Waste Treatment; 7. Industrial Fire Protection; 8. Industrial and Environmental Cancer Risks; 9. Toxicology; 10A. Chemical Substances Legislation; 10B. An Industrial Response to Chronic Health Hazards; 11. Labelling and Identification of Hazardous Materials. Sections 10A and 10B are new, replacing Food Additives of the fourth edition.

Sax's regular readers will soon become accustomed to the slightly changed format of Section 12 and new readers will be impressed with the wealth of information and understand why Sax has become the classic in the field.

CLYDE MCKINLEY

Director

Corporate Research Services

Department

Air Products and Chemicals, Inc.

Allentown, Pennsylvania

Principles of Polymer Processing. Zehev Tadmor and Costas G. Gogos. 736 pp. Wiley-Interscience, 1979. \$37.50.

One sign that a scientific or engineering sub-discipline is approaching maturity is the appearance of comprehensive and definitive books on the subject. The textbook by Tadmor and Gogos on processing of polymeric materials is such a book. The similarity of experiences of a polymeric material in different processing operations is stressed by conceptually breaking all processes down into elementary steps and shaping operations. Different specific processes or machines which are used in practice are presented as different routes or mechanisms for accomplishing the important elementary steps of

melting, mixing, pumping and solids handling. Each of these is treated in detailed individual chapters by developing the engineering mathematical analyses of the various mechanisms for accomplishing the elementary steps.

Shaping operations are treated separately with chapters on die forming, molding, calendaring and secondary shaping. The final chapter shows how some fourteen important actual processes can be broken down into constituent elementary steps and shaping operations. The attempt is made to introduce the reader to some concepts of design *synthesis*, a refreshing change in an area where research has been dominated by *analysis*.

Early chapters in the book provide useful, though highly abbreviated, introductions to some of the basic principles of polymer physics and morphology, and their interplay with processing, as well as the equations of mechanics of continuous media. The uninitiated may have difficulty beginning these subjects with this text. The authors motivate further, more in-depth study.

Where appropriate, the text is augmented with solved quantitative examples and it contains over 130 homework problems. It is very well referenced and indexed. One may make some minor criticisms of the book, especially with regard to material *not* covered. Heat transfer coverage is limited primarily to melting, with little treatment of convection or viscous dissipation. Mass transfer problems go virtually unmentioned. These really are minor points given a book which treats the comprehensive set of problems it *does* tackle with such excellent con-