

delineated, nor are quantitative comparisons given with other types of rubber. Compatibility and solubility data, as well as the treatment of butyl vulcanization, will disappoint rubber technologists. Molecular weight-intrinsic viscosity relations for the polymers are not presented. Older patent references to some halogenated polymers are included, but no discussion of the recently important brominated and chlorinated butyls.

The printing is good and there are few typographical errors. There is an author index and a rather inadequate subject index. The idea of abbreviating company names in footnotes is a good one, but the system here leads to EIPNC for du Pont and MSGIMC for Montecatini.

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Polythene: The Technology and Uses of Ethylene Polymers, 2nd Ed., edited by A. RENFREW and PHILLIP MORGAN. Interscience, New York; Iliffe, London, 1960. xxi + 781 pp. \$25.75.

This book, like the first edition (1957), is separated into three parts: Manufacture and Properties; Processing Techniques; Applications. The present edition is substantially enlarged, bringing the chapters in the first edition up to date and introducing additional chapters covering more recent developments. The new material includes a review of high density polymerization processes, a discussion of the copolymer field, and sections on vacuum forming and reprocessing.

Each chapter is written by a man or men who are well versed in the topic under consideration, with the sections covering structure and properties being particularly well handled. In a book covering such a broad scope each section must be treated in limited detail; however, in most cases the material included reviews the topic at hand very well and many references are given for those interested in more detail. A survey of the references cited in those areas with which the reviewer is more familiar indicates that they cover the literature quite comprehensively up to and through much of 1959. As with all books where a great many authors contribute there is, of course, some overlapping and duplication of material, in most cases from a somewhat different viewpoint. The editors appear to have cross-referenced these overlapping areas well so that it is possible to easily locate all the material included on a given subject.

It is the evident purpose of the book to survey the whole field of polyethylene and it is the reviewer's opinion that this purpose is well accomplished. The book should be of interest to both those who are not experts in the field but have occasional need of information about polyethylene, and to the expert who needs a well referenced text in those areas of polyethylene technology which are outside his particular specialty.

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Nature and Properties of Engineering Materials.

Z. D. JASTRZEBSKI. Wiley, New York-London, 1959, xvii + 571 pp. \$11.00.

It is a challenge to every new generation of teachers to reassess and update methods and materials used in the college curriculum. To meet this challenge, Dr. Zbigniew D. Jastrzebski, professor of chemical engineering at Lafayette College, has written an informative college textbook on materials. As a description of the theoretical principles which form a common basis for understanding the properties and behavior of matter, his book would be difficult to better. The author brings to the task a considerable knowledge of all the engineering sciences including concepts in modern (nuclear) physics and a valuable experience in teaching.

In 1955, Dr. Jastrzebski had occasion to submit a syllabus for a course called the nature and properties of engineering materials. This memo proposed the inclusion of such a course in his college's curriculum and contained the following statements:

"The great variety of materials now available for use by an engineer makes it extremely difficult to cover satisfactorily this immense and constantly expanding field when treated in a more or less descriptive way. I believe that the best approach to the study of engineering materials should be based on a thorough understanding of fundamental principles combined with practical aspects of their application. Recent developments in the theory of solid state, atomic and molecular structure of matter, and nuclear physics make it possible to provide a broad and comprehensive picture of the nature and properties of engineering materials. The course, when taught in this manner, will eliminate obsolete subject matter and provide a sound basis for practical reasoning. This approach will also encourage the student to think why and how any particular material is used rather than what it is used for."

Shortly thereafter the course became a reality and as a consequence this book was published.

Dr. Jastrzebski's book is divided into 12 chapters. Beginning with an introduction to the Bohr atom, it goes on to describe the elements of the atomic and electronic structure of matter. Chapter 1 also explains the interatomic and intermolecular (Van der Waal) forces and their relationship to the structural characteristics of both crystalline and amorphous materials.

Chapter 2, colloids and organic high polymers, presents a physicochemical description of colloidal materials and emulsions. Specific polymeric materials, their molecular structure, and the mechanics of polymerization are described. This is followed by a discourse, in Chapter 3, on the phenomena of diffusion and crystalline nucleation, phase transformation in solids, and phase equilibria between liquids and solids. Chapter 4 describes the mechanical behavior and structural characteristics of solids. Elasticity, plasticity, and flow characteristics are described in terms of the main types of engineering materials; a discussion of strength and other properties follows. Also included is a short discussion of radiation damage to mechanical properties of materials.

Chapters 5 and 6 are readable, up-to-date surveys of manufacturing processes for metallic and ceramic materials. Included are discussions on the reduction of metals from their principal ores, the alloying of metals, and the production of cermets. Chapter 7 describes electrical and mag-