

Wood Chemistry, Pulp, Paper and Board Division, Applied Chemistry Section, International Union of Pure and Applied Chemistry. (Proceedings of the Wood Chemistry Symposium held in Montreal, Canada, August 9-11, 1961). Butterworths, London, 1962. 254 pp. \$9.00.

This is not a treatise on wood chemistry, but a survey of fifteen specialized topics comprising papers presented at the Wood Chemistry Symposium in 1961. The series first appeared in *Pure and Applied Chemistry*, Vol. 5, Nos. 1-2, from which the book is reprinted.

The authors are authorities in their respective fields, and their important research contributions form the cores of the papers. The subjects include a range from basic organic and physical chemistry of wood components to studies in applied chemistry—pulping and bleaching.

One paper is devoted to recent work on the chemical and morphological aspects of the fine structure of wood. Papers on the biogenesis of carbohydrates and of lignin explore the intriguing problems of biochemical processes leading to the formation of these familiar wood components. The physical chemistry of lignin is discussed in one paper.

The sections dealing with cellulose include viscoelastic properties, methods of determining crystallinity, applications of infrared spectroscopy, and chemical mechanisms in grafting. The three papers in the field of hemicelluloses are concerned with methods of isolation and purification, fractional extraction, and determination of chemical structure, areas in which so many advances have been made in the last decade.

In applied aspects, primary emphasis is placed on chemical reactions of lignin in the pulping and bleaching processes. The progress reported is impressive, even in the absence of detailed knowledge about the structural relationships among the simpler units which make up the lignin system. Individual papers deal with recent developments in sulfite pulping, reactions of lignin in kraft pulping, and the chemistry of delignification in pulp bleaching. The behavior of carbohydrates during pulping and the nature of hemicelluloses remaining in the wood pulp are considered in another paper; understanding of these relationships is gradually unfolding, with important implications for the pulping industry.

The restriction of subject matter has made possible a reasonably extended discussion of each selected topic, certainly in more detail than would have been possible in a text of more comprehensive coverage. Each author has been careful to place the work in historical perspective, and sufficient introductory material is included to enable the reader to follow the development easily. Special attention is given to recent researches, in which the authors have contributed so significantly. This personal engagement is effectively imparted to the reader as an exciting story of the research endeavor.

The book should be of value to those desiring summaries of recent research in the several areas represented by the contents. There is no index, but perhaps one is not necessary for a book in which each section will undoubtedly be read as an entity.

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Polyurethanes: Chemistry and Technology, Part I. (High Polymers, Vol. XVI). J. H. SAUNDERS and K. C. FRISCH, Interscience, New York, 1962. xi + 368 pp., \$14.00.

This volume is the most complete book to date on polyurethanes prepared from polyisocyanates and complimentary active hydrogen compounds. This field of polymers is growing so rapidly that it is anticipated Part I will need revision in a few years.

It is fortunate indeed that two well recognized industrial polymer chemists, Drs. J. H. Saunders and K. C. Frisch, have collaborated in the writing of this book. Because of their extensive experience in polyurethanes, this volume has the ring of authority.

Part I covers raw materials, reactions of isocyanates and isocyanate derivatives, kinetics and catalysis of isocyanate reactions, formation of urethane forms and relationships between polymer structure and properties in urethanes. It should be pointed out that in addition to the isocyanate route to polyurethanes, there is a growing field of polyurethane chemistry wherein polychloroformates replace polyisocyanates. This latter route, in addition, allows formation of polyurethanes from di-secondary diamines which cannot be prepared from polyisocyanates. Discussion of this phase has been omitted.

Chapters IV and XI are especially useful both to researchers concerned with fundamental aspects of isocyanate chemistry and to technologists concentrating more in the applied field. It might be questioned if the chapter on formation of urethane foams (V) was rightfully included in Part I, but rather should be in Part II, on technology. By including foam technology in Part I, other aspects of end-use urethane products, such as elastomers, might well have been included.

A very useful part of the book is the information included in the Appendices. Sources of commercially available isocyanates, polyethers, polyesters, with their Trade Names and Generic Names, are listed.

This volume is a major contribution to polyurethane chemistry, largely emanating from Industrial Laboratories, beginning from early work in the du Pont and Bayer Companies. It is anticipated that more academic researchers will contribute to the chemistry of polyurethanes, especially to the more obscure aspects, such as mechanism of reactions, secondary reactions, and the true role of the wide variety of catalysts used.

The picture of Professor Otto Bayer as a frontispiece is a fitting tribute to his enormous contribution in the field of isocyanate chemistry as applied to polymers.

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The Sadtler Standard Spectra of Monomers and Polymers, Vol. I, II, & III. Sadtler Research Laboratories, Philadelphia, Pa. in three 8.5 × 11 in. loose leaf binders, 29 pp. + 3,200 spectra. \$1,000.

The publishers of these volumes have apparently obtained 3,200 samples of commercial monomers and polymers from a host of national and international companies and determined their infrared spectra. The spectrograms are indexed both according to spectra number and according to an alphabetical listing of the materials by trade name and manufacturers code. The information accompanying each spectrum includes the manufacturer, the type of sample used, and the conditions of measurement. For some spectra, only the trade name is given, while for others, additional information is presented; for example, generic name, melting point, or viscosity.

These spectrograms could be useful to those engaged in identification of polymeric and monomeric materials or in quality control. Although such a vast collection of spectrograms might be a valuable addition to any library, the set is lacking in several respects. There is no foreword to the collection which would be helpful to the reader in letting him know whether there is any system involved in the compilation, and no index by polymer or monomer type or structure.