

Book review

Cellulose and its Derivatives; Chemistry, Biochemistry and Applications: edited by J. F. KENNEDY, G. O. PHILLIPS, D. J. WEDLOCK, AND P. A. WILLIAMS, Ellis Horwood, Chichester; Halsted (Wiley), New York, 1985, 533 pages + List of Participants + Subject Index, £45.00.

This volume on cellulose and its derivatives contains a collection of papers that were presented at an international meeting of cellulose researchers from industrial and academic laboratories. The meeting was held at Wrexham, Wales, and the topics of the papers deal with the current status of work on, and the industrial applications of, cellulose.

The book consists of 49 chapters, of which 43 have been grouped into four Parts, and 6 chapters represent poster presentations: Part 1, Structure and Physicochemical Properties of Cellulose; Part 2, Biochemical, Chemical, and Radiation Degradation of Cellulose and Lignocellulose; Part 3, Cellulose Derivatives and Industrial Applications; Part 4, Cellulose as a Matrix Material.

Part 1 contains 7 chapters that discuss structural aspects of cellulose and cellulose fibers as revealed by X-ray crystallography, n.m.r. spectroscopy, chemical analysis by electron-emission spectroscopy, and heat-capacity measurements. Part 2 contains 9 chapters dealing with the degradation and modification of cellulose by chemical reactions catalyzed by alkalis, acids, salts, heat, ozone, and ionizing radiations. This part also contains several chapters covering the biological degradations of cellulose by micro-organisms and by enzymes of fungal and bacterial origins. Part 3 contains 16 chapters treating cellulose derivatives and industrial applications. Studies on the properties of cellulose derivatives of importance and use in industrial applications are emphasized. Newer aspects of the chemistry of cellulose nitrate, cellulose sulfate, cellulose acetates, and other cellulose esters are discussed in separate papers. Papers on the kinetics of reactions for the preparation of derivatives are included. In addition, several review-type articles are recorded. Part 4 contains 11 chapters dealing with a wide range of topics, such as graft copolymers, combustion of cigarette paper, reactions of cellulose with chromium trioxide, immobilization biotechnology, disulfide cross-linked cellulose, adsorption of chitosan on cellulose, and photochemical modification of cellulose films. Finally, the group at the end of the book (from poster presentations) consists of six papers; the topics of these are diverse, and include novel degradation reactions, copolymerization, free-radical depolymerization, and enzymology of cellulases and xylanases.

The papers in the book vary greatly in format, depth of coverage, and quality. There are several review-type articles that might well have been more appropriate in an *Advances* or *Review* series if they had been expanded and made more comprehensive. The majority of the papers in the book are reports of current research, and such would be more suitable for publication in standard scientific journals, thus ensuring that the manuscripts had received judicious review, adequate revision, and improvement by the inclusion of additional experimental data.

In view of the many outlets for scientific papers and reviews, there is cause to wonder if there is a need for such a publication as *Cellulose and its Derivatives* and similar books, based on papers presented at a conference or meeting of a society. Generally, reports at scientific conferences are progress or preliminary reports, and are not necessarily in suitable form for publication. However, such reports can form the basis of excellent publications in research journals.

The scope of the book encompasses many aspects of cellulose chemistry and its derivatives, and appears to be adequate. However, the scientific depth and merit of many of the chapters may be of a questionable nature. Some chapters contain very limited data on specialized topics, and additional documentation would be desirable. Other chapters contain data that have been obtained, with elaborate instruments and sensitive analytical methods, on preparations of cellulose and cellulose derivatives of a heterogeneous nature and questionable purity! Accordingly, an interpretation of such data is often impossible and, in fact, inappropriate.

This book contains numerous errors in nomenclature of compounds, in spelling, and in recording of data in Tables and Figures. Also, unorthodox abbreviations are used, and, as a result, the reader can spend more time trying to unravel the abbreviations than in studying the subject matter of the particular chapter. Because the articles in the book were reproduced directly from the typed manuscripts, variations in the quality of the typing of the various chapters are apparent. The typing in some chapters is single-spaced, whereas, in others, it is double-spaced, and the typing in articles may be very dark or very light. The introductory pages to the book have not been numbered; generally, it is customary to number these pages in small Roman numerals. Corrections and additions have been made in ink in several chapters (for example, in Chapters 1, 2, and 46). Some chapters (for example, Chapters 1, 8, and 23) contain gaps in spacings, unaligned lines, and italicized words that should *not* be italicized. Some articles contain Figures, Tables, and formulas that are too small to be readily legible (for example, in Chapters 23, 25, 35, and 41). The official rules for nomenclature of compounds have not always been used, and, in some cases, the conventional method of numbering of atoms in the structural formulas of compounds has been disregarded. The Table headings are not uniform throughout the book. Some Figures lack legends, whereas others have incomplete legends. One Figure has been reproduced on two different pages (51 and 152), and was not identified by number and legend in either case. These shortcomings must be laid at the door of the four Editors.

The book will be of use primarily to researchers in cellulose-chemistry

laboratories as a reference book for obtaining directions in methodology and instrumentation techniques, but is too specialized to have value for instructional purposes in the classroom. Scientists working in the cellulose area may wish to purchase the book for their personal library. However, it is likely that the book will be more suitable for a library collection.

*The Pennsylvania State University
University Park, PA 16802*

JOHN H. PAZUR