



## Book reviews

**Chemical Reactions of Natural and Synthetic Polymers.** M. Lazar, T. Bleha and J. Rychly, Ellis Horwood Limited, Chichester 1989. 250 pp. ISBN 0-7458-0193-5. Price £35-00.

Interest in the modification of polymers in practice predates determination of the structure and macromolecular character of several natural materials. For example, this was the case with the tanning of leather, and also much later in that of the chemically more advanced but still empirical investigations of the vulcanization of rubber and the nitration of cellulose.

Currently, the properties of polymers are modified mostly via irreversible changes in the chemical structure of macromolecules. In this way, starting from available macromolecular substances, the variety of materials is broadened. Quite new horizons are also opened by research on biochemical macromolecular systems and models.

This book reviews the chemical transformations of both natural and synthetic macromolecules with particular reference to the practical applications. There are important sections on branching, linking and crosslinking, and degradation of macromolecules. Novel properties and potential applications of modified polymers are also included. Therefore, this volume provides a useful background to the study of chemical transformation of macromolecules and is recommended for any polymer science library.

Marion Paterson  
John F. Kennedy

**Organic Chemistry in Action: The Design of Organic Synthesis.** Felix Serratosa, Elsevier Science Publishers, Amsterdam, 1990. 396 pp. ISBN 0444883452. Price US\$14875.

Much progress has been made in recent years in our knowledge of the life sciences especially at the molecular level. Since the world is filled with a variety of living things, we should devote more attention to organic chemistry. There is indeed considerable interest in the replication and simulation of natural organic chemistry.

*Organic Chemistry in Action* describes principles and methodologies for designing organic synthesis, with

special emphasis on the Lapworth Evans model of alternative polarities and the Heuristic principles.

The interactive program (*CHAOS — Computerisation and Heuristic Applied to Organic Synthesis*) enclosed in this book allows an heuristic aid for designing organic synthesis, providing a fast and easy way to learn and search for new synthetic schemes.

However, the personal written style of the author is unusual. He uses expressions such as 'diabolic confabulation' (page 7), 'inorganic accidents' (page 24), 'mental degradation' (page 43). The content of the book is more orientative than instructive.

This book should be regarded and used as a reference source for research and planning of synthetic routes, rather than as a text book.

Zilda M.B. Figueiredo  
John F. Kennedy

**Pulp Paper and Board.** Edited by I.F. Hendry and W.J.H. Hanssens, Elsevier Applied Science Ltd, London, 1988. x + 197 pp. ISBN 1-85166-173-5. Price £26-00.

Cellulose is the main component of lignocellulosic raw material. It can be obtained by pulping processes used in the production of paper and board. Several conferences on this matter have led to the production of books dealing with cellulose, lignin and hemicelluloses in their various aspects such as chemistry, structure, bioconversions, etc.

The book is a collection of papers from a seminar organised by the Commission of the European Communities. It is divided into six sections. An introduction to the seminar and an opening address to welcome the participants make the opening section.

Several aspects of wood defibering processes and high yield pulping include the behaviour of wood during mechanical defibering, the influence of mechanical and chemical treatment on the energy consumption, the perfecting of new fibrous composition to reduce the low cost of papers and board, pulp purification and bleaching by new technology processes and their possible use in some paper grades.

The problem of stickies in the reuse of waste paper and paper manufacturing is discussed in depth from different viewpoints. Components of the waste paper that contribute to the stickies during the process, stickies formation in paper recycling due to hot melt and pressure sensitive adhesives, and alternative processes for optimization of the recycling paper process in order to avoid the stickies are all covered.

Finally, an overview and conclusions are presented with some consideration of the future of the European paper industry, wood as a renewable raw material and plans for the future.

The book shows the results of the experiments, but does not present an experimental approach. It is rather a book for those who want to be informed about what is happening in the area, but not for practical guidance. Also, it does not contain a subject index, which would have facilitated readers' searches for specific topics.

John F. Kennedy  
Eduardo H.M. Melo

**Polymer Science Dictionary.** Mark S.M. Alger. Elsevier Applied Science, London, 1989. xii + 532 pp. ISBN 1-85166-220-0. Price £110-00.

As defined by the author, polymers are substances whose molecules consist of many parts or units. They are formed by the process of polymerisation of a monomer or of more than one monomer (for a copolymer). Man-made polymers are known as synthetic polymers, whereas those produced biologically, whether in the natural field or by laboratory-directed processes, are known as natural polymers, biological polymers, or just biopolymers. Some prefer to believe that in general

jargon the term polymers only applies to synthesis, and that the term macromolecules must be applied to those molecules. By and large, the properties of synthetic and biological polymers are different, being hydrophobic and hydrophilic, respectively. This book focuses particularly on synthetic polymers.

Polymers of all types (particularly synthetic polymers) gained acceptance because they have enabled the cheap fabrication of articles which had been previously manufactured from more expensive alloys. Today a number of polymers are available commercially and their properties have been optimised to suit particular application. The plastics, rubbers, fibres, coatings, paint and adhesives industries are all based on polymers.

The *Polymer Science Dictionary* is the first publication devoted to explaining the terminology of polymer science with coverage of polymerisation, polymer structure, properties and individual polymer types as well as some biopolymers: proteins and polysaccharides.

This book could be considered an encyclopaedic dictionary due to the large numbers of entries ( $\approx 6000$ ). There are explanations of what terms mean, together with any necessary background, as they are used in the polymer literature. For the most important polymers, entries give values of the main mechanical properties to facilitate general comparison among such polymers.

The *Polymer Science Dictionary* uses Standard International (SI) units throughout; in addition, where other units are commonly used in the polymer literature, these are also included. It is recommended as a very useful reference and browsing book to anyone involved in polymer research, development and production.

Regina C.M. Paula  
John F. Kennedy