



Book reviews

Chitin Chemistry. Edited by George A.F. Roberts, Macmillan Press, Hong Kong, 1992. 350 pp. Price £65.00. ISBN 0-333-52417.

Chitin, a polysaccharide closely related in chemical structure to cellulose, is being studied by many research groups for development in a wide variety of applications. Most current research centres work on the deacetylated version of chitin, which is called chitosan. The importance of chitin and chitosan has grown partly because they represent a renewable and biodegradable source of materials, and partly because of the recent increased understanding of their functionality in biology and in technological, biotechnological and medical applications. As the second most abundant natural polymer, chitin and its derivative chitosan, represent a great challenge both to the scientific community and to industry.

The increased interest in commercial applications has stimulated research in both academic and industrial laboratories, and this is leading to a much better understanding of the chemistry and macroscopic properties of the polymer. 'Chitin Chemistry' reviews the current status of knowledge of chitin and chitosan and presents the most recent research results in this progressive field including information on occurrence, structure, isolation, characterisation and analysis. The book also deals with preparation of derivatives by chemical modifications, and the chemical behaviour (acid–base properties, metal ion sorption, adsorption and degradation) and solution properties (solubility, solution properties, gelation and adsorption of chitosan) of such derivatives. However, their possible applications have not been discussed in this book apart from a few brief references.

Alphabetical organisation, extensive cross-referencing and a complete index further enhance the utility of this book. 'Chitin Chemistry' should be an important research reference tool, desk-top information resource, and supplementary reading asset to reaching professionals and their students, and we recommend it to all those engaged in a wide variety of scientific fields including polymers, textile, pharmaceuticals, personal care products and agriculture.

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Paper Recycling-Strategies, Economics & Technology
Edited by Ken L. Patrick, Miller Freeman Publications Inc., San Francisco, 1991. vi + 202 pp. Price \$45.00. ISBN 0-87930-231-3.

The mid 1980s saw a dramatic increase in public awareness and interest in recycling and environmental issues in general. Consequently, the paper industry had to adjust to major changes in markets and technology as public opinion shifted to a preference for recycled goods. This is not to say that recycling is a novel strategy; it is in fact about as old as the papermaking process itself. However, any recycling prior to the 1980s was more or less a matter of economics.

Environmental issues have been somewhat of a catalyst in recent years to the growth in secondary fibre consumption. However, improvements in technology, scarcity of virgin fibre, and the incentive of a lower cost fibre alternative have also contributed.

One of the biggest challenges in today's recycling systems is the removal of contaminants. They are a problem in the manufacture of any recycled paper product, and the worst of these substances are pressure-sensitive adhesives and hotmelt materials, collectively known as 'stickies'. For many paper grades, recycled products can and should be as good as their virgin counterparts. Considerable improvements have been made in the basic recycled pulping operation in recent years. Most gains have been in increased efficiency. However, most recycling research and development efforts of the past decade have been focussed on the deinking process. A deinking system is primarily a separation process, the quality of such a system being defined as the maximum removal of ink particles with minimum fibre loss.

In the 1990s Americans are facing a solid waste disposal crisis, hazardous waste and toxic industrial processes, water and energy shortages, pollution and depletion of natural resources. With paper as one of the most pervasive products in American society, the paper industry finds itself squarely in the environmental spotlight. This book provides a detailed guide to recycling in the US pulp and paper industry, and also provides insight into world trends, legislation and technology in the ever increasing business of recycling. It has a concise index, is well presented, and is thoroughly recommended. It is encouraging to see that the book is itself