

Book review

Chitin and Chitosan: Sources, Chemistry, Biochemistry, Physical Properties and Applications, Edited by Gudmund Skjåk-Bræk, Thorleif Anthonsen, and Paul Sandford. Elsevier Science Publishers Ltd., London, 1989, xxii + 288 pages + Author and Subject Index, £ 86.00.

This 835-page book is a collection of short papers and long abstracts presented at the Fourth International Conference on Chitin and Chitosan, held in 1988 at Trondheim, Norway. It contains 90 separate contributions ranging from new chemical modifications of chitin and biomedical properties of chitosan to the use of chitosan in cosmetics. The most notable feature, overall, is the emergence of chitosan as an important polycationic polysaccharide. The microbial synthesis of chitosan has been identified and the simultaneous action of chitin synthase and deacetylase in the proposed mechanism for its biosynthesis. This suggests that fermentation may soon be another path to commercial quantities of chitosan, supplementing the chemical deacetylation of chitin.

At present, about 20 commercial ventures worldwide produce about five million pounds of chitin, mainly from shellfish. It is estimated that this is only one fiftieth of the chitin which is exploitable. Judging by the range of applications which are described and the emerging knowledge of chitin enzymology, it is reasonable to expect that the trend towards a global "ecocracy" ensures a bright future for chitin and chitosan. Japan alone has 15 companies producing the material in various forms, for applications ranging from medical and biomedical materials to personal-care products. Because of chitosan's non-toxic nature, biocompatibility, and variety of forms, it is being widely explored for applications in biotechnology, for example, enzyme immobilization.

Although it was discovered and named before cellulose, chitin has received much less attention over the past century. Only now are homogeneous-phase syntheses of derivatives being explored. However, the production of chitin and chitosan will never match that of chemical cellulose, and hence specialty applications remain the principal objective. In this respect, many of the described innovations mimic developments already successful with cellulose and other carbohydrate polymers. Examples include microcrystalline chitosan, capsules for drug delivery, and beads for enzyme immobilization.

The contributions are quite uneven in detail and quality. Fundamental aspects are covered to a minimal degree, while there is a focus on applied enzymology. The development topics range from new derivatization methods to applications in medicine and biotechnology. Each paper contains references, so that the reader is able to follow

up on even the briefest “long abstract”. The manuscripts and figures are photoreproduced adequately and the editors have ensured a reasonable quality and error-free text.

This is a book to be recommended only for library purchase, where its main usefulness will be as a timely review of the latest chitin/chitosan advances in research. This is especially true for industrial and institutional research centers where value-added specialty materials with an environmental or biomedical focus are important research themes. Such topics are thoroughly covered in this report.

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