

The abundance of carbohydrates in nature has prompted research into utilizing simple monosaccharides as starting materials for a range of high value compounds, offering a renewable alternative to current starting materials. *Carbohydrate Chemistry* is aimed for chemists, biochemists and biologists. It provides very useful information for scientists, as well as for postgraduates, and is a guide for lecturing staff at an undergraduate level. It contains extensive referencing at the end of each chapter, as well as detailed diagrams and illustrations.

J.F. Kennedy

N. Turan

*Birmingham Carbohydrate and Protein Technology Group,
Chembiotech Laboratories, The University of Birmingham,
Research Park,
Birmingham B15 2SQ, UK*

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New Ingredients in Food Processing: Biochemistry and Agriculture

G. Linden, D. Lorient; Woodhead Publishing, Cambridge, 1999, xviii + 366 pages, ISBN 1-855-73443-5, £115.00

The agro-food industry has experienced a technology revolution over the last decade which has led to a dramatic expansion in the manufacturing of tailor-made ingredients, which are often referred to as 'intermediate food products' (IFPs). This volume aims to provide a comprehensive guide to the development and use of IFPs, covering their purpose, benefits, properties, and ways in which their manufacture can be tailored to the requirements of the food industry. The food industry is under constant pressure to innovate as it faces ever increasing variations in demand and specific requirements from the consumer, in terms of both nutritional and sensory characteristics.

This volume is essentially divided into two broad sections. The first section comprises nine chapters that cover the manufacture of IFPs, and looks at their development, common functional properties, methods of extraction, purification and texturisation, and details those IFPs derived from plants (proteins, oils and fats), milk (proteins and lipids), eggs, meat, fish and seaweed. IFPs from by-products (whey, blood, collagen and gelatin) are also discussed.

The second section of this volume comprises six chapters that examine the properties and potential utilisation of biomolecules, namely carbohydrates, lipids, amino acids, peptides, pigments and aroma compounds, which are purified and/or modified by enzymatic and chemical treatments. In each case composition, functional properties, methods of manufacture, and applications are covered. Three chapters

in this section are devoted to carbohydrates and detail sugar chemistry, starch products, and hydrocolloids and dietary fibre, respectively. Specific carbohydrates discussed include sucrose, lactose, inulin, polyols, parietal carbohydrates, starch, maltodextrins, cyclodextrins, carrageenan, agar, alginate, chitin and polysaccharide gums.

This volume successfully delivers a summary of the work performed on IFPs during previous decades, and more importantly, details the biochemical foundations for the future commercial exploitation of agricultural products. It is therefore highly recommended as an invaluable reference volume for individuals involved in all aspects of food research.

J.F. Kennedy*

C.J. Knill

*Birmingham Carbohydrate & Protein Technology Group,
Chembiotech Laboratories,
The University of Birmingham Research Park,
Birmingham B15 2SQ, UK
E-mail address: jfkennedy@chemistry.bham.ac.uk*

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* Corresponding reviewer. Tel.: +44-121-414-7029; fax: +44-121-414-7030.

Cellulose Derivatives: Modification, Characterization, and Nanostructures

ACS Symposium Series 688; T.J. Heinze, W.G. Glasser (Eds.); American Chemical Society, Washington, DC, 1998, xii + 361 pages, ISBN 0-8412-3548-1, US\$ 130.00

Significant advances in cellulosic modification, both chemically and enzymatically, and the resultant production of derivatives with unique chemical, physical and physiological properties, has dramatically increased the interest in cellulose research over the past decade. This renewed focus upon cellulose derivatives is a result of several factors, for example the availability of new cellulose sources (especially bacterial cellulose), the development of new solvent systems for cellulose activation/solubilisation (and their corresponding regenerated fibres), the development of new regioselective modification methodologies, and increased understanding of the enzyme systems involved in cellulose degradation.

The purpose of the ACS Symposium Series is to publish timely, comprehensive books developed from ACS sponsored symposia based on current scientific research. This book was developed from a symposium entitled '*Recent Advances in Cellulose Modification*' held at the 212th National Meeting of the American Chemical Society, and

was organised with the intent of bringing together scientists from academia and industry which would be useful for the development of novel, value-added materials from cellulose.

The book is essentially divided into three sections. The first section encompasses modification chemistry and includes eight chapters which highlight advances in homogeneous and heterogeneous phase modifications of cellulose to create unusual derivatives, often with regioselective substitution patterns. This initial section demonstrates that recent research on chemical conversion of cellulose is mainly directed towards the synthesis of functionalised derivatives with well-defined primary structures, both within the anhydroglucose repeat unit and along the polymer chain. Specific topics covered include novel solvents and solution complexes, regiocontrol, long-chain esters, induced phase separation, and selective oxidation.

Comprehensive analytical data is essential when assessing new synthetic methodologies and optimising chemical processes for cellulose functionalisation. The next seven chapters, which comprise the second section of the book, therefore cover chemical and molecular structure and highlight advances in the analysis of selectively and specifically modified cellulosic derivatives. Specific topics covered include substituent distribution in the monomer unit and the polymer chain, solution-state and solid-state NMR spectroscopic analysis of cellulose esters, FT-IR spectroscopic analysis of crystalline and noncrystalline cellulose, enzymatic hydrolysis of cellulose derivatives, and molecular weight distributions of degraded cellulose and cellulose nitrates.

The processing of materials with defined supramolecular architectures is an important area of cellulose research. The final section of this volume contains nine chapters which detail aspects of supramolecular structure and highlight advances in the self-assembly of cellulosic macromolecules in dilute and concentrated solutions and in solids. Such supramolecular architectures have potential application in novel sensors, immunoassays, membranes and biocompatibilised surfaces, and light-wave conductors.

In conclusion, this is an extremely informative volume that provides detailed insight into state-of-the-art methodologies for the synthesis and characterisation of novel cellulose derivatives and supramolecular architectures, and their application. It is therefore highly recommended to all individuals, both in industry and academia, with interests in any aspects of cellulose modification.

C.J. Knill
J.F. Kennedy*

*Birmingham Carbohydrate and Protein Technology Group,
Chembiotech Laboratories,
The University of Birmingham Research Park,
Birmingham B15 2SQ, UK
E-mail address: jfkennedy@chemistry.bham.ac.uk*

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* Corresponding reviewer.