

**Book Reviews**

***Paper and Composites from Agro-based Resources*; R.M. Rowell, R.A. Young, J.K. Rowell (Eds.); CRC Press, Boca Raton, 1997, ix + 446 pages, ISBN 1-56670-235-6, £87.50**

Agro-based fibres have been utilised in a wide range of applications for many years. However, the diversity of such applications has increased dramatically over the last decade as many countries are facing increasing pressure to develop alternative sources of fibres for the production of renewable products. Research is therefore focusing upon the utilisation and assessment of fibres from a broad range of sustainable crops, some of which are waste products from other applications.

The first section of this book is devoted to the growth and inventory of agro-based fibres. The current and future availability of agro-based plants is discussed in the first chapter and demonstrates the tremendous volume of fibres available for use in bio-based products. Changes in fibre properties during growth and potential improvement of fibre crops via genetic engineering are also treated in this section. A good understanding of the properties of fibres is required, in order to properly utilise them in bio-based products. Thus, the second section of this book details the physical, mechanical and chemical properties of fibres and also includes standard procedures for chemical analyses and an extensive compilation of fibre properties. One of the major uses of agro-based plants is in the production of pulp and paper. Therefore, a section in this book provides an extensive discussion of the various methods utilised for pulp and paper production and details specific pulping and properties of paper from a wide variety of agro-based plants.

The use of bio-based composites has rapidly expanded in recent years and there is tremendous potential for future growth in this area. A broad range of agro-based fibres is utilised as the main structural components or as fillers/reinforcing agents in such composite materials. The methods and approaches utilised for production of the many different types of composites based on agro-fibres is thoroughly described in the final and largest section of this book. The properties of both low and high fibre content thermoplastic and thermosetting-based composites are described and methods for the chemical modification of fibres for property enhancement are also discussed. Other topics covered include packaging and lightweight structural composites, filters, sorbents and geotextiles.

This book aims to provide in one volume a unique compilation of comprehensive information on the current and

future applications of agro-based fibres for paper and composites. It is an extremely informative volume that is an invaluable source of information for all researchers interested in agro-based fibres.

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***Spectral Methods in Food Analysis*; M.M. Mossoba (Ed.); Marcel Dekker, New York, 1999, 468 pages, ISBN 0-8247-0223-9, US\$165.00**

Vast developments in the field of spectroscopic research are currently undergoing major technological advancement and the use of spectroscopy in novel applications is growing rapidly. Spectral techniques have found many practical applications in food science. They have been applied to the analysis of intact foods as well as the identification and quantitation of many types of individual compounds of interest, namely, food constituents, additives, and contaminants.

Spectral Methods in Food Analysis gives a comprehensive, up-to-date and authoritative understanding of the field of spectroscopic research of foods. It covers introductory topics, outlining basic principles and is an advanced reference source drawing together many specialised spectral techniques, their instrumentation and applications. The literature describes the elucidation of molecular structure for pure isolated compounds and components of complex mixtures, as well as established and new techniques such as MRI. It categorises spectroscopic issues created by food complexity, and reviews the applications of EPR, including post-irradiation dosimetry. Also included in the literature are details of non-invasive and non-destructive measurement techniques, as well as the utility of vibrational spectroscopy.

Aiding the literature are useful references (over 850), as well as tables, equations, drawings and photographs. Each of these illustrations is well presented, relevant as well as scientifically accurate.

This publication is suitable for food scientists and technologists; food, analytical, and brewing chemists; biochemists; toxicologists and microbiologists; quality assurance and control, composition, nutrition, materials testing, biochemical, and food safety engineers; spectroscopists and chromatographic analysts; and graduate students in these disciplines.

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A Complete Introduction to Modern NMR Spectroscopy; R.S. Macomber; Wiley, Chichester, 1998, xvii + 382 pages, ISBN 0-471-15736-8, £45.00

Nuclear Magnetic Resonance (NMR) spectroscopy has made astonishing progress during the last decade. Computer-controlled NMR spectrometers with high-field superconducting magnets, previously only available to well-funded institutions, are now relatively commonplace. Indeed, NMR techniques are utilised in a range of divergent fields, e.g. chemistry, physics, materials science, biology, medicine, forensic science, etc. The aim of this volume is to provide a monograph for a broad range of individuals, not just chemists, and it is therefore assumed that the reader only has a basic scientific background, all of the necessary details being developed from the most basic level. The overall approach is relatively non-mathematical, however, by the end of the book the reader should be well prepared for solving any molecular structure problem given a complete set of NMR data.

The first three chapters of the book discuss the physics of NMR signal generation by covering some preliminary considerations, the magnetic properties of nuclei, and obtaining an NMR spectrum, respectively. The majority of readers will be interested in the use of NMR for the elucidation of molecular structure and hence a large portion of this volume, namely Chapters 4–12, aims to provide all of the information necessary for the reader to perform such tasks efficiently. Chapter 13 discusses the use of two-dimensional NMR techniques, which have developed into indispensable tools for the elucidation of the structure of complex molecules. This leads nicely into the following chapter, which outlines NMR studies of biologically important molecules, such as proteins, nucleic acids, lipids, and carbohydrates. The penultimate chapter covers solid-state NMR spectroscopy. NMR techniques are extremely important with respect to medical diagnosis, in the form of magnetic resonance imaging (MRI), which is discussed in the final chapter.

Modern NMR Spectroscopy is an extremely clear and logical introduction to one of the most important, and potentially complex, analytical techniques in use today. The chapters directly follow on from each other, gradually enhancing the knowledge of the reader. There are frequent example problems (with solutions) throughout each chapter, and at the end of each chapter is a summary and several review problems to assess mastery of the concepts in the chapter. There are also two self-tests (after Chapters 7 and 13) that assist in assessing overall mastery of the subject. The answers to these reviews and self-tests are located in the appendices. In conclusion, this volume is highly recommended to individuals of any scientific discipline with interests in NMR spectroscopy, specifically those who are new to the utilisation of NMR spectroscopic techniques for the elucidation of molecular structure.

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Organozinc Reagent: A Practical Approach; P. Knochel, P. Jones (Eds); Oxford University Press, Oxford, 1999, xiv + 354 pages, ISBN 0-19-850121-8, £60.00

Methodologies for the synthesis of organozinc reagents have been known since the middle of the nineteenth century, however it is only in the last decade that they have begun to fulfil their potential as one of the most useful classes of organometallic reagents for organic synthesis. This volume details the application of organozinc reagents to organic synthesis and aims to highlight the synthetic opportunities offered by such versatile reagents which will tolerate a wide spectrum of functionality. This is facilitated by redressing the common misconception that they behave like other organometallic reagents, such as organolithium and Grignard reagents, which are incompatible with many functional groups.

The first eight chapters of this volume illustrate the numerous methodologies available for the preparation of a wide range of organozinc reagents, e.g. organozinc halides, fluorinated organozinc, diorganozinc, triorganozincates, 1,*n*-bismetallc reagents, etc. The following seven chapters demonstrate the potential afforded by these mild and highly selective reagents by focusing upon specific types of reactions involving organozinc reagents, e.g. uncatalysed and catalysed reactions, asymmetric additions, cyclopropanation, the Reformatsky reaction, and Barbier reactions. Detailed experimental protocols are provided throughout all chapters