

beings, and gives some idea of the wonderfully complex activities within the yeast cell.

The sixteen chapters of this book cover taxonomy, ecology, yeast nutrition, morphology and cytology of yeast cells, its life cycle and metabolism, the “killer” phenomenon, molecular biology of the yeasts, spoilage yeasts and industrial yeasts. It also has special sections on membranes, genetics and molecular biology of methylotrophic yeasts, yeast in food fermentation and therapeutics, and yeast in the production of fuel-grade ethanol.

Each chapter provides a very interesting reference work of direct relevance for researchers in this field. This book is recommended to all libraries concerned with microbiology, biochemistry and molecular biology.

Marion Paterson, John F. Kennedy

*Birmingham Carbohydrate and Protein Technology Group,  
School of Chemistry, The University of Birmingham,  
Edgbaston, Birmingham B15 2TT, UK*

0144-8617/99/\$ - see front matter © 1999 Elsevier Science Ltd.

All rights reserved.

PII: S0144-8617(98)00151-9

***NMR of Polymers*, F.A. Bovey, P.A. Mirau, Academic Press, San Diego, 1996, pp. x + 459, Price \$85-00, ISBN 0-12-119765-4**

Nuclear Magnetic Resonance (NMR) spectroscopic techniques are of tremendous interest and importance for the observation of every aspect of the structure and properties of macromolecular substances. The current importance of NMR for the structural characterisation of synthetic and natural polymers can be visualised from the multitude of papers published in areas of polymer science that rely on NMR techniques for the elucidation of structural details. High resolution solution NMR has always played a key role in the determination of polymer microstructure and assisted in the understanding of polymerisation mechanisms, and the development of multidimensional NMR has facilitated more detailed understanding of polymer microstructure and detailed molecular level assignments of polymer dynamics. More recently, the development of solid-state NMR has allowed researchers to investigate the structure, conformation, organisation, and dynamics of polymers in their native state.

This volume aims to provide an overview of the applications of NMR to polymer characterisation, and begins with two excellent introductory chapters which detail the fundamentals of NMR, and the microstructure of polymer chains, respectively. The latter chapter discusses polymer chain structure in terms of regioisomerism, stereochemical configuration, geometrical isomerism, branching and cross-linking. This is of particular interest as peaks from the different microstructures can be resolved in the NMR spectrum,

providing a detailed and quantitative characterisation of chain microstructure.

The third chapter in this volume discusses the high resolution solution-state NMR of polymers, and includes multi-nuclear NMR studies and the two-dimensional NMR techniques employed for examining polymer microstructure, chain conformation, and the structure of associating polymers. NMR spectroscopy has been extensively utilised for the characterisation of polymers in solution, essentially to understand structure–property relationships at the molecular level and to ascertain how changes in the synthetic methodology affect the structure of materials.

The penultimate chapter provides insight into the field of solid-state NMR of polymers, covering the NMR determination of chain conformation in semicrystalline and amorphous polymers, polymer blends, and multiphase polymer systems, as well as the NMR methods used to study chain organisation on longer length scales. The final chapter outlines the dynamics of macromolecules, providing detailed information on the NMR methods used to study polymer dynamics both in solution and in the solid state. The study of the molecular dynamics of polymers is of great importance, as many synthetic polymers are useful because of their physical and mechanical properties in the solid state, properties which are ultimately related to molecular-level dynamics. Studies in solution primarily reveal information about intramolecular forces, while the molecular dynamics in the solid state are determined by the combination of intra- and inter- molecular forces.

In conclusion, this is an extremely informative volume that provides a wealth of background information into the history, development and modern application of NMR techniques to the everyday problems associated with polymer characterisation. It is therefore highly recommended to academic and industrial researchers with interests in such areas of polymer science.

John F. Kennedy, Charles J. Knill

*Birmingham Carbohydrate and Protein Technology Group,  
School of Chemistry, The University of Birmingham,  
Edgbaston, Birmingham B15 2TT, UK*

0144-8617/99/\$ - see front matter © 1999 Elsevier Science Ltd.

All rights reserved.

PII: S0144-8617(98)00152-0

***Nuclear Magnetic Resonance*, Vol. 25, G.A. Webb (Senior Reporter), The Royal Society of Chemistry, Cambridge, 1996, pp xxi + 541, Price £179-50, ISBN 0-85404-307-1**

This volume is part of the ‘Specialist Periodical Reports’ series on NMR which continues to provide comprehensive coverage of the NMR literature, essentially on an annual basis and represents a review of the literature published