

## Book reviews

**Recent Research on Wood and Wood Based Materials.** Edited by N. Shiraishi, H. Kajita and M. Norimoto. Elsevier Science, UK, 1993. xiii + 262 pp. Price Dfl. 292.00; US\$166.75. ISBN 0-444-81691-7.

To enhance the effort in disseminating knowledge and technology from the Japanese scientific and engineering community to other parts of the world, the book '*Recent Research on Wood and Wood Based Materials*' which is the 11th volume of the *Current Japanese Materials Research (CJMR)* series is aiming to highlight the current Japanese achievements in the field of materials science and technology.

Everyone would agree that wood is one of the natural resources which has made a significant contribution towards mankind's civilisation and development. As it is composed of 50–55% cellulose, 15–25% hemicellulose and 20–30% lignin with additional small quantities of minor components, wood has been used as a raw material for a variety of physical and chemical processes for the production of valuable and useful end-products such as fibre board, particle board, furniture, pulp and paper and plywood panel. Wood has the competitive edge over other materials like metal, plastic and glass because it is a multicomponent, hygroscopic, anisotropic, fibrous, porous, biodegradable and renewable material.

The book is a compilation of various technical papers, in which all the 18 topics can be classified into several main areas or sections. They are structural and chemical properties of wood, applications and high value added products, processing technology, biodegradation mechanism of wood and finally preservation techniques to prevent biodeterioration. Since the contributors of the book are the expertise from the universities, senior researchers from the research and development institutes and experienced executives from the relevant industry, the book provides a wide spectrum of information, knowledge and the latest technology for the readers. Physical, mechanical, chemical, technical, biochemical and engineering aspects are well covered, except the economical, environmental and social aspects are not documented. The book is probably tailored more towards the production of good quality wood and wood based materials. Therefore, the book is a good investment to anyone who is interested in wood and wood based materials, particularly to those who are directly involved in this interesting and challenging area. Lecturers, research students, relevant R &

D and industrial communities are recommended to have this book on the shelf.

John F. Kennedy  
Wan Hasamudin

**Gas–Solid Hydroxyethylation of Potato Starch.** By N.J.M. Kuipers. PhD Thesis, University of Groningen, 1995. vi + 353 pp. Price £30 (paperback); £40 (hardback). ISBN 90-9008137-2.

Starch can be chemically modified, by e.g. oxidation, esterification, etherification, etc., in order to improve specific properties. In order to retain the easy flow and handling properties and to avoid excessive drying costs, chemical modifications of starch are preferably carried out in such a way that the granular structure is maintained. The industrial derivatisation of starch is performed for a variety of reasons, however, the most important motives are to modify the gelatinisation and cooking characteristics of granular starch, to decrease the retrogradation and gelling tendencies of amylose-containing starches, to increase the water-binding capacity of starch dispersions, to enhance either hydrophilic or hydrophobic properties and/or to introduce ionic substituents.

Manufacturing techniques for the production of hydroxyalkyl ethers of starch (white, odourless and tasteless powders) have been around for several decades. From about 1950, these processes were applied to manufacture hydroxyalkyl ethers of relatively low degrees of ether group substitution by reacting alkaline starch with ethylene oxide.

This thesis focuses on the development of a gas–solid reactor for the hydroxyethylation of potato starch. The first chapter discusses the background and overall outline of the thesis. Chapter 2 reviews the properties of the major components playing a role in the hydroxyethylation, namely ethylene oxide, (potato) starch particles, and water absorbed by the starch granules and the hydroxyethyl starch product. This information is beneficial in understanding the reactive diffusion behaviour of the overall system. Chapters 3–6 deal with the intra-particle diffusion and reaction of gaseous ethylene oxide in semi-dry potato starch granules.

The design of a suitable reactor for this process requires the selection of a gas–solid contactor and knowledge of the flow behaviour of the reagents in such a reactor. Gas–solid mass transfer and heat transfer will