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Carbohydrate Polymers 45 (2001) 105–108

Carbohydrate Polymers

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Book Reviews

Recent Progress in Bioconversion of Lignocellulosics

Advances in Biochemical Engineering Biotechnology, Vol. 65; G.T. Tsao (Ed.); Springer, Berlin, 1999, vi + 292 pages, ISBN 3-540-65577-8, DM309.00

The continued development of biosustainable and renewable resource technology is of great importance with respect to environmental concerns. The successful and economic recycling of biomaterials will also assist in slowing down the continued deterioration of the environment. The bioconversion of lignocellulosics, natural and man-made, is an extremely important part of this process. This volume describes recent advances in the bioconversion of lignocellulosics. The volume begins with two articles on genetics and properties of cellulases and their reaction kinetics, molecular action and mechanisms. The cost of cellulases has been a hindrance to the large-scale use of enzymatic hydrolysis. Two articles on cellulase production by submerged fermentation and by solid state fermentation are included to describe the state of the art in this area.

Dilute acid hydrolysis of cellulose continues to be of interest as well as potentially useful. Treatment of lignocellulosic biomass with dilute sulphuric acid has been primarily used as a means of hemicellulose hydrolysis and pretreatment for enzymatic hydrolysis of cellulose. Significant advancement has also been made in the dilute acid hydrolysis of cellulose. The most recent advances in this area are discussed. Xylose utilisation is essential for the efficient conversion of lignocellulosic materials to fuels and chemicals. An article discusses the progress that has been made in genetic engineering for improved regulation of xylose fermentation by yeasts. A chapter on genetically engineered *Saccharomyces* for simultaneous fermentation of glucose and xylose describes the important advances made in production of fuel ethanol from lignocellulosic biomass.

In recent years there has been increasing interest in recycling and the reuse of scrap paper as well as other environmental considerations. An article discusses avenues for available research using cellulose (in the form of scrap paper) as a substrate for bioconversion that can lead to commercialisation. Vast amounts of renewable biomass are available for conversion into useful fuels and chemicals. In order to convert biomass to ethanol, the efficient utilisation of both cellulose-derived and hemicellulose-derived carbohydrates is essential. The final two articles present recent advances in the use of lignocellulosic biomass for the production of ethanol and organic acids, respectively. The microbial production of multifunctional organic acids has received considerable interest due to their increased use in the food industry and their potential as raw materials for the manufacture of biodegradable polymers. In summary, this volume contains a wealth of useful information and will be invaluable to all researchers with interests in aspects of lignocellulosic science.

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PII: S0144-8617(00)00258-7

Protective Groups in Organic Synthesis (3rd Edition)

T.W. Greene, P.G.M. Wuts; John Wiley & Sons, Inc., New York, 1999, xxi + 779 pages, £58-50, ISBN 0-471-16019-9

The development of new methods for functional group protection/deprotection continues to be an important facet of natural and unnatural product synthesis. When a chemical reaction is to be carried out selectively at one reactive site in a multifunctional compound, other reactive sites must be temporarily blocked. The selection of protective groups is therefore important in such a synthetic methodology. A protective group must react selectively in good yield to give a substrate that is stable to the projected reaction conditions. It must also be selectively removed in good yield by reagents that do not attack the regenerated functionality.

'*Protective Groups in Organic Synthesis*' aims to provide a detailed insight into the protection/deprotection methodologies available for the major classes of chemical functionality. The focus of the text is placed firmly upon chemical details rather than general discussion. The best methods of formation and cleavage and some information on the scope and limitations of each protective group are given. The protective groups that are used most frequently and that should be considered first are listed in detailed reactivity charts, which give an indication of the reactivity