DESCRIPTION

Lignocellulosic materials are a natural, abundant and renewable resource essential to the functioning of industrial societies and critical to the development of a sustainable global economy. As wood and paper products, they have played an important role in the evolution of civilization. Improvement of the quality and manufacturing efficiency of such products has often been hampered by the lack of understanding of the complex structures and chemical compositions of the materials.

Due to increasing economic and environmental issues concerning the use of petrochemicals, lignocellulosic materials will be relied upon as feedstock for the production of chemicals, fuels and biocompatible materials. Significant progress has been made to use lignocellulosic materials for the production of fuel ethanol and as a reinforcing component in polymer composites. Effective and economical methods for such uses, however, remain underdeveloped, partly due to the difficulties encountered in the characterization of the structures of native lignocelluloses and lignocelluloses-based materials. Improved methods for the characterization of lignocellulosic materials are needed.

Characterization of Lignocellulosic Materials covers recent advances in the characterization of wood, pulp fibres and papers. It also describes the analyses of native and modified lignocellulosic fibres and materials using a range of advanced techniques such as time-of-flight secondary ion mass spectrometry, 2D heteronuclear single quantum correlation NMR, and Raman microscopy. The book provides a survey of state-of-the-art characterization methods for lignocellulosic materials, for both academic and industrial researchers who work in the fields of wood and paper, lignocelluloses-based composites and polymer blends, and bio-based fuels and materials.
Dr. THOMAS Q. HU is a Principal Scientist at FPIInnovations - Paprican Division and an Adjunct Professor in the Chemistry Department at the University of British Columbia (UBC). He received his B.Sc. (1983) in Polymer Science and Engineering from South China Institute of Technology, and his M.Sc. (1988) and Ph.D. (1993) in Synthetic Organic Chemistry from UBC. He joined Paprican in 1994 after a two-year tenure there as an NSERC Canada Industrial Postdoctoral Fellow.

His area of expertise is in the application of advanced, next-generation chemistry to solve various long-standing technological problems in the pulp and paper industry. He has pioneered the work in the novel modification of lignin functional groups, the development of fibre-reactive radical scavengers for the photostabilization of lignocellulosic materials, and the bleaching of lignin-rich wood pulps with phosphorus-based chemicals. He has developed a number of novel processes for the bleaching and brightness stabilization of lignin-rich wood pulps. He has over 70 publications including one edited book on Chemical Modification, Properties and Usage of Lignin, five issued international patents and several pending US and Canadian patents. He has won a number of prestigious awards including the 2004 Journal of Pulp and Paper Science Best Paper Award and the 2005 Pulp and Paper Technical Association of Canada Douglas Atack Award for Best Mechanical Pulping Paper.

Contributors to the book:
Dr. Umesh P. Agarwal
Dr. Mikhail Balakshin
Dr. S.M. Braaten
Dr. Ewellyn Capanema
Dr. Richard P. Chandra
Dr. H. Chang
Dr. Y. R. Chen
Dr. N Cordeiro
Dr. Ari R. Esteghlalia
Dr. D.V. Evtuguin
Dr. Pedro Fardim
Dr. G.E. Fredheim
Dr. Goran Gellerstedt
Dr. Wadood Y. Hamad
Dr. Hyoe Hatakeyama
Dr. Tatsuko Hatakeyama
Dr. Bjarne Holmborn
Dr. S. Horita
Dr. Akira Isogai
Dr. Krista Koljonen
Dr. Ingvild Kvien
Dr. R.A. Lauten
Dr. Stu Lebo
Dr. Kaichang Li
Dr. John A. Lu
Dr. B.F. Lutnaes
Dr. Sirkka Liisa Maunu
Dr. T.J. McNally
Dr. B.O. Myrold
Dr. T. Nanbo
Dr. Kristiina Oksman
Dr. Ana Lucia Oliveira
Dr. T. Onishi