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Characterization of the Cellulosic Cell Wall; Contents; Contributors; Preface; Acknowledgments; Part I Cell Wall Assembly and Function: New Frontiers; Chapter 1 Tracheid and Sclereid Differentiation in Callus Cultures of *Pinus radiata*; Chapter 2 Tracheid and Sclereid Differentiation in Callus Cultures of *Pinus radiata*; Chapter 3 Mechanics of the Wood Cell Wall; Chapter 4 Prediction of Wood Structural Patterns in Trees by Using Ecological Models of Plant Water Relations; Chapter 5 Preparation and Properties of Cellulose/Xylan Nanocomposites Part II Probing Cell Wall Structure Advances in Analysis Chapter 6 Determining Xylem Cell Wall Properties by Using Model Plant Species; Chapter 7 The Temperature Dependence of Wood Relaxations A Molecular Probe of the Woody Cell Wall; Chapter 8 Rapid Estimation of Tracheid Morphological Characteristics of Green and Dry Wood by Near Infrared Spectroscopy; Chapter 9 FTIR Imaging of Wood and Wood Composites; Chapter 10 Near Infrared Spectroscopic Monitoring of the Diffusion Process of Deuterium-labeled Molecules in Wood; Chapter 11 Wood Stiffness by X-ray Diffractometry Part III Mesostructure and Applications Science in Practice Chapter 12 Selected Mesostructure Properties in Loblolly Pine from Arkansas Plantations; Chapter 13 Changes of Micro.brl Angle after Radial Compression of Loblolly Pine Earlywood Specimens; Chapter 14 Variation of Kink and Curl of Longleaf Pine (*Pinus palustris*) Fibers; Chapter 15 Effect of Chemical Fractionation Treatments on Silicon Dioxide Content and Distribution in *Oryza sativa*; Chapter 16 Characterization of Water-soluble Components from MDF Fibers Chapter 17 Effects of Re.ner Pressure on the Properties of Individual Wood Fibers Chapter 18 Wood Structure and Adhesive Bond Strength; Chapter 19 Adhesion Mechanisms of Durable Wood Adhesive Bonds; Index

This volume brings together a broad array of scientific expertise to focus on the characterization and utilization of cellulosic materials. Researchers from Austria, Germany, Sweden, Japan, New Zealand, Australia, and the U.S. explore many facets of the plant cell wall, from its fundamental structure and its manipulation via molecular biology to its application in composite materials. Exciting applications of near infrared spectroscopy, x-ray diffraction, confocal microscopy, and molecular coupling as a viscoelastic probe provide new insights into the ultrastructure and properties of cellulosi