# TABLE OF CONTENTS

Volume 1

**NCC: The Revolution** .......................................................... 1
Jim Dangerfield

**Individualization of Nano-Sized Plant Cellulose Fibrils Achieved by Direct Surface Carboxylation Using TEMPO Catalyst** .......................................................... 49
Akira Isogai

**Multiscale Modeling of Nanostructured Cellulose** ................ 73
Stanislav R. Stoyanov, Sergey Gusarov, Andriy Kovalenko

**Adopting a Life Cycle Approach to Risk Analysis for Novel Forest Products** .......................................................... 88
Jo Anne Shatkin

**Managing the Health and Environmental Risks of Nanotechnology in the Forest Products Industry** .......................................................... 117
Jo Anne Shatkin

**A Risk Assessment Framework to Guide Development of Emerging Nanoscale Forest Products** .......................................................... 152
Larry Kapustka

**The Responsible Development of Nanotechnology: Striking the Balance Between Risks and Benefits** .......................................................... 164
Lori Sorensen

**Composite Nano- and Micro-Fibers with Cellulose Nanocrystals** .......................................................... 189
Soledad Peresin, Justin Zoppe, Youssef Habibi, Orlando J. Rojas

**Probing Molecular, Nanoscale and Adhesive Forces Related to Fiber-Fiber Bonding and Optimized Surface Interactions** .......................................................... 229
Agne Sveria, Birgit Brandner, Viveca Wallqvist, Martin Wahlander

**Current Knowledge of Nanomaterial Toxicity** .......................................................... 284
Nigel Walker

**A Legal Perspective on the Environmental, Health & Safety Aspects of Nanomaterials – Navigating the Uncertainties** .......................................................... 336
James G. Votaw

**Emerging Markets for Nano-Enabled Biomaterials** .......................................................... 367
Hadi Mahabadi

**Materials of 21st Century Forest Products: Kaolin** .......................................................... 381
Phil Jones

**VINNOVA** .......................................................... 416
N/A

**Delivering New Technologies to the Forest Products Sector – A Canadian Academic Perspective** .......................................................... 425
Robert Pelton

**Smart Pigments with Reactive Nanocolors Printed on Paper and Flexibles** .......................................................... 433
N/A

**Effect of CPVA Characteristics on Fiber and Paper Properties** .......................................................... 457
Pedram Fatehi, Huining Xiao

**Biomass and the Development of High Value Materials and Products: An Economic Perspective for Sustainable Living** .......................................................... 482
Don Roberts

**Nano-Enabled Materials for Sustainable Living** .......................................................... 535
Carlo Montemagno

**Morphological Design of Highly Porous Nanocellulose Structures** .......................................................... 582
Jenni Sievänäen, Hans-Peter Hentze, Tuomo Hjelt

**Effects of Chemical Pretreatments on Enzymatic Hydrolysis of Lignocellulose Observed at Macro, Micro and Nano Scales** .......................................................... 607
J. Y. Zhu, H. Liu, W. Zhu, J. F. Beecher, K. Li, S. Fu

**Nano-cellulose Materials for the Furniture and Building Industry Made From Recovered Waste Paper** .......................................................... 645
Alf Wheeler

**Anti-UV Waterborne Nanocomposite Coatings for Exterior Wood** .......................................................... 661
Mirela Vlad, Bernard Riedl, Pierre Blanchet

**UV-Waterborne Nanocomposite Coatings: Curing Kinetics Study** .......................................................... 682
Caroline Sow, Bernard Riedl, Pierre Blanchet

**Nanocomposites Coatings for Wood Industries** .......................................................... 698
Véronique Landry, Pierre Blanchet