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2.3.2.1 Structure and Rigidity of Chitin Nanocrystals
2.3.2.2 Properties of Chitin Nanocrystal Suspensions
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3.2 Surface Chemistry of Polysaccharide Nanocrystals
3.2.1 Surface Hydroxyl Groups; 3.2.2 Surface Groups Originating from Various Extraction Methods; 3.3 Approaches and Strategies for Surface Modification; 3.3.1 Purpose and Challenge of Surface Modification; 3.3.2 Comparison of Different Approaches and Strategies of Surface Modification; 3.4 Adsorption of Surfactant; 3.4.1 Anionic Surfactant; 3.4.2 Cationic Surfactant; 3.4.3 Nonionic Surfactant; 3.5 Hydrophobic Groups Resulting from Chemical Derivatization; 3.5.1 Acetyl and Ester Groups with Acetylation and Esterification
3.5.2 Carboxyl Groups Resulting from TEMPO-Mediated Oxidation
3.5.3 Derivatization with Isocyanate Carboamination; 3.5.4 Silyl Groups Resulting from Silylation; 3.5.5 Cationic Groups Resulting from Cationization; 3.6 Polymeric Chains from Physical Absorption or Chemical Grafting; 3.6.1 Hydrophilic Polymer; 3.6.2 Polyester; 3.6.3 Polyolefin; 3.6.4 Block Copolymer; 3.6.5 Polyurethane and Waterborne Polyurethane; 3.6.6 Other Hydrophobic Polymer; 3.7 Advanced Functional Groups and Modification; 3.7.1 Fluorescent and Dye Molecules; 3.7.2 Amino Acid and DNA
3.7.3 Self-Cross-linking of Polysaccharide Nanocrystals

Sommario/riassunto

Polysaccharide nanocrystals can be derived from the renewable resources cellulose, chitin or starch, which makes them ideal candidates for ""Green Materials Science"". This versatile material class can be used in nanocomposites such as rubber or polyester, and in functional materials such as drug carriers, bio-inspired mechanically adaptive materials or membranes. Moreover, polysaccharide-based nanomaterials are environmentally friendly due to their intrinsic biodegradability. With its interdisciplinary approach the book gives a thorough introduction to extraction, structure, properties, surfac

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