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High value-added cellulose products prepared from low-grade cellulose resources

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Cellulose is the most abundant renewable organic material with a host of current and potential uses. Starting with dissolving pulp as a purified raw material, cellulose is converted industrially into regenerated materials (fibers, films, food casings, membranes, sponges, etc.) and cellulose derivatives (ethers and esters). However, until now, the main resource for commercial cellulose production are concentrating on the highly pure cellulose resources such as, cotton linters and dissolving wood pulp. This fact makes the cellulose resource expensive to obtain. In contrast, the low-grade lignocellulosic biomass has become attractive as a renewable resource because it is available in large quantities and routinely widely cultivated in the world. At present, development of new and effective methods to convert low-grade cellulose into high value-added products is critical. With this aim, we developed two strategies: All-cellulose nanocomposites reinforced with *in situ* retained cellulose nanocrystals during selective dissolution of cellulose in an IL; and blending low degree of polymerization (DP) cellulose with a small amount of high-DP cellulose. With these two strategies, some low-grade cellulose resources, such as agricultural straw, waste newspapers, and waste cellulose-containing fabrics, were converted into high value-added cellulose-based films. In this talk, I would like to introduce our research progress in this field.

Biography

Jun Zhang is a Professor of Polymer Science and Materials at CAS Key Laboratory of Engineering Plastics, Institute of Chemistry, Chinese Academy of Sciences (ICCAS). He obtained his PhD degree from Dalian University of Technology of China, in 1999. He has published more than 150 research articles and three book chapters and holds 28 China patents. His research interests include processing and functionalization of natural polymers, physics and chemistry of cellulose, ionic liquids and their applications in polymer materials, and high performance polymers and polymer composites.

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