
Nanocellulose for control synthesis of nanoparticles and antimicrobial applications

Title Control of Silver Nano-particle Nucleation and Synthesis with Nanocellulose: Applications in Paper–based Sensing and Anti-microbial Activity

Content Due to their unique physical-chemical properties, nanomaterials are finding applications in diagnosis, therapy, antibacterial, antifungal and anti-inflammatory activity. Silver nanoparticles (AgNPs), especially, have become very popular but still require feasible chemical methods for their synthesis, by using sustainable, renewable, and environmentally friendly sources. In this work, new routes for the synthesis of AgNPs from wood-based cellulose nanocrystals (CNCs) is described. The influence of the surface charge of CNC on the rate of nucleation, growth, stabilization and size distribution of AgNPs was investigated. The size of the nanoparticles was found to depend strongly on nanocellulose surface properties. The utilization of cellulose-AgNPs materials in the development of a paper-based protein sensor and antibacterial applications is proposed and discussed.

Field Bioproduct Technology

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