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Preparation of antimicrobial hybrid nano-materials using regenerated cellulose and metallic nanoparticles

Running title: Preparation of antimicrobial hybrid nano-materials

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Highlights

- Hybrid nano-materials of regenerated cellulose and metallic nanoparticles were prepared.
- Hybrid nano-materials were characterized by SEM, EDX, ICP, TGA, FTIR, and XRD.
- Hybrid nano-materials exhibited strong antibacterial activity.
- -Developed hybrid nanocomposites can be used as a multifunctional nanofillers.

Abstract

In this study, antimicrobial hybrid nano-materials were prepared by one-pot syntheses of silver (Ag), copper oxide (CuO), or zinc oxide (ZnO) nanoparticles (NPs) during regeneration of cellulose from cotton linter (CL) and microcrystalline cellulose (MCC). SEM micrographs indicated that the metallic nanoparticles were attached to the surface of the regenerated cellulose. EDX and ICP results showed that more AgNPs were adsorbed on the cellulose than CuONPs or ZnONPs. FTIR results revealed that the metallic nanoparticles were attached to the cellulose through the interaction with the hydroxyl group of cellulose. XRD results showed the

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