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Anti-bacterial chitosan/zinc phthalocyanine fibers supported metallic and bimetallic nanoparticles for the removal of organic pollutants

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Highlights

- Novel chitosan composite fibers as support for nanoparticles
- Metallic and bimetallic zero valent nanoparticles grown onto the composite fibers
- Efficient catalysts for the reduction of nitrophenols and dyes
- Excellent catalytic efficiency
- High stability and recyclability
- High antibacterial activity

Abstract

In this report, we prepared chitosan (CS) membrane, CS/zinc phthalocyanine (ZnPc-CS) composite fibers and pellets as support for the synthesis of zero valent metal nanoparticles. The composite fibers and pellets of ZnPc-CS were prepared by simply dispersing 5 wt% of ZnPc in CS solution. ZnPc-CS composite were applied as economical host material for the development of metallic and bimetallic zero valent nanoparticles. The composites of ZnPc-CS were put in 1 M metals salt solutions (mono- and bi-metallic) for the adsorption of metal ions. The metal ions adsorbed ZnPc-CS fibers were treated with 0.1 M NaBH₄ aqueous solution for conversion of

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