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Samaneh Lotfiman, Mohammad Ghorbanpour



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Antimicrobial activity of ZnO/Silica gel nanocomposites prepared by a simple and fast solid-state method

Samaneh Lotfiman, Mohammad Ghorbanpour*

Chemical Engineering Department, University of Mohaghegh Ardabili, Ardabil, Iran

Abstract

The formation of Zinc oxide (ZnO) nanoparticles on silica gel (SG) is achieved through a new one stage solid state method. The only precursor used was ZnCl_2 . The preparation of nanocomposite is accomplished by heating a mixture of ZnCl_2 and silica gel at 450°C , leading to the formation of ZnO particles on the surface. The structure, morphology, absorption spectrum and homogeneity of the ZnO/Silica gel nanocomposites (ZnO/SG) were characterized. The absorption spectra of the nanocomposites show the change of state from silica gel to ZnO/SG. X-Ray Diffraction (XRD) patterns prove the formation of the ZnO/SG. Micro-EDXRF (energy dispersive X-ray fluorescence) analysis of the composites showed good homogeneity. The antibacterial test of the samples against *Escherichia coli* and *Staphylococcus aureus* shows the strong antibacterial activity of nanocomposites when confronted by these bacteria.

Keywords: ZnO, silica gel, nanocomposite, molten salt method, antimicrobial activity.

*E-mail: Ghorbanpour@uma.ac.ir

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