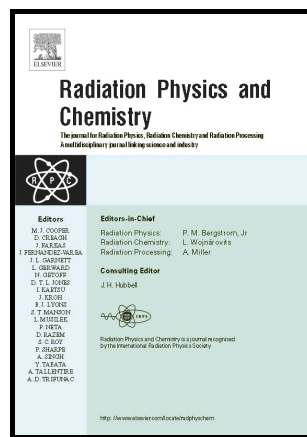


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ABSTRACT

Silver nanoparticles (AgNPs) with diameter about 9 nm were deposited on diatomite by irradiation under electron beam of diatomite suspension containing 10 mM AgNO₃ in 1% chitosan solution, at the dose of 20.2 kGy. The AgNPs/diatomite nanocomposite was characterized by UV-Vis spectroscopy, TEM image and energy dispersive X-ray spectroscopy (EDX). The antibacterial activity of the AgNPs/diatomite against *E. coli* and *S. aureus* was evaluated by reduction of bacterial colonies on spread plates and inhibition zone diameter on diffusion disks.

Keywords: Electron beam, silver nanoparticles, diatomite, nanocomposite, chitosan, antibacterial

1. Introduction

Nanocomposites are composed by nanosized particles in a matrix such as polymer or inorganic substrate (Hussain et al., 2006; Pomogailo, 2005). These materials were improved in the characteristics of both constituents including nanoparticles and matrix. Nanoparticles received attention in the field of material as well as chemistry by high surface area reactivity and homogeneous physicochemical properties (He et al., 2014). Especially, AgNPs were concerned by the high antibacterial activity besides the other features. They inhibited the growth of bacteria, attacked and disrupted cell membranes of harmful bacteria such as *Staphylococcus aureus* (*S.*

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