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Anticandidal Activity of the Spinel Ferrite CoFe2O4 Nanospheres

Cobalt ferrite nanoparticles (CoFe2O4-NPs) have received much interest regarding potential applications in medicine. They have potential to be used in magnetic resonance imaging (MRI), diagnostics, electronic devices, cancer treatment and drug-delivery technology due to their high permeability, coercivity, moderate magnetization, high saturation magnetization and physiochemical stability. The required sizes and shapes of the spinel ferrites nanocrystals can be achieved depending on a variety of fabrication methods and/or precipitation agents, for example sol-gel methods, the ball-milling technique, co-precipitation, the reverse micelles process, and the micro-emulsion method. Antibacterial activity of angular- and irregular-shaped cobalt ferrite nanoparticles synthesized by sol-gel technique has been reported. Polyaniline/CoFe2O4 nanocomposite has also shown to inhibit the growth of Candida albicans by ROS production. In the present study, CoFe2O4 nanospheres were carried out in a solvothermal system by modified reduction reactions between FeCl3 and ethylene glycol. SEM micrographs showed that the size of CoFe2O4 nanospheres was about 20-40 nm. Cobalt ferrite nanospheres (2 mg/ml) were sonicated in distilled water and supernatant was used to test antifungal activity against Candida albican. Measured by dynamic light scattering, the average size of CoFe2O4 nanospheres dispersed in supernatant was 56.68 nm. The MIC was found at 1/2048 dilution of the supernatant which implicated that CoFe2O4 nanospheres obtained by solvothermal system had strong anticandidal activity.

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