





Article

In Vitro Intracellular Hyperthermia of Iron Oxide Magnetic Nanoparticles, Synthesized at High Temperature by a Polyol Process

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Abstract: We report the synthesis of magnetite nanoparticles (IOMNPs) using the polyol method performed at elevated temperature (300 °C) and high pressure. The ferromagnetic polyhedral IOMNPs exhibited high saturation magnetizations at room temperature (83 emu/g) and a maximum specific absorption rate (SAR) of 2400 W/g_{Fe} in water. The uniform dispersion of IOMNPs in solid matrix led to a monotonous increase of SAR maximum (3600 W/g_{Fe}) as the concentration decreased. Cytotoxicity studies on two cell lines (cancer and normal) using Alamar Blues and Neutral Red assays revealed insignificant toxicity of the IOMNPs on the cells up to a concentration of 1000 μg/mL. The cells internalized the IOMNPs inside lysosomes in a dose-dependent manner, with higher amounts of