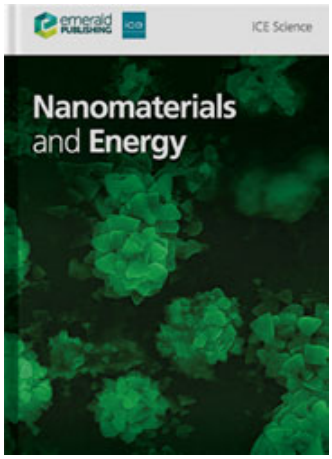

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Preparation and characterisations of magnetic nanofl zinc ferrite for hyperthermia

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Abstract

Zinc ferrite ($ZnFe_2O_4$) nanoparticles were synthesised by using solution gelation and the self-combustion technique. The ferrite nanoparticles were structurally analysed by X-ray diffraction (XRD), field-emission scanning electron microscopy (F vibrating sample magnetometry for structural, morphological and magnetic properties, respectively. The XRD pattern sho prepared sample has a spinel monophasic cubic structure, and the broadening of X-ray peaks indicates the nanocrystalli particles to be on the order of 13 nm. FE-SEM analysis shows spherical-type grains and confirms the nanocrystalline natu average grain size of 24 nm. The energy-dispersive X-ray analysis spectrum indicates the purity of the sample and the pr desired ions in good proportions. The magnetisation–field strength (*M*–*H*) hysteresis loop shows enhanced magnetisatior superparamagnetic nature of zinc ferrite nanoparticles compared with previous literature reports. The saturation magnetis (M_s) was estimated to be 23·25 emu/g. The obtained nanoparticles of zinc ferrite were used to prepare nanofluids with w base fluid (2 mg/ml concentration). Magnetic hyperthermia studies were carried out using an induction heating system. Th heating results show that a small amount (2 mg/ml) of zinc ferrite nanoparticles can achieve a 42°C temperature for 258 s

Full Text

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