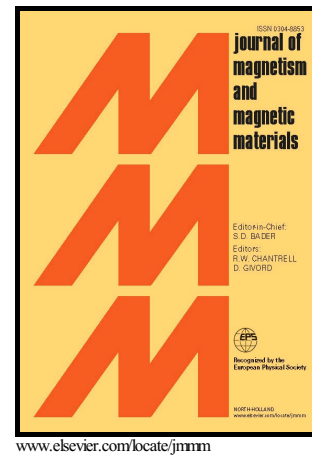


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A comparison between acoustic properties and heat effects in biogenic (magnetosomes) and abiotic magnetite nanoparticle suspensions

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Abstract

Magnetic nanoparticles show unique properties and find many applications because of the possibility to control their properties using magnetic field. Magnetic nanoparticles are usually synthesized chemically and modification of the particle surface is necessary. Another source of magnetic nanoparticles are various magnetotactic bacteria. These biogenic nanoparticles (magnetosomes) represent an attractive alternative to chemically synthesized iron oxide particles because of their unique characteristics and a high potential for biotechnological and biomedical applications. This work presents a comparison between acoustic properties of biogenic and abiotic magnetite nanoparticle suspensions. Experimental studies have shown the influence of a biological membrane on the ultrasound properties of magnetosomes suspension. Finally the heat effect in synthetic and biogenic magnetite nanoparticles is also discussed. The experimental study shows that magnetosomes present good heating efficiency.

Keywords: Magnetic nanoparticles, Magnetosomes, Ultrasonic wave, Hyperthermic effect

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