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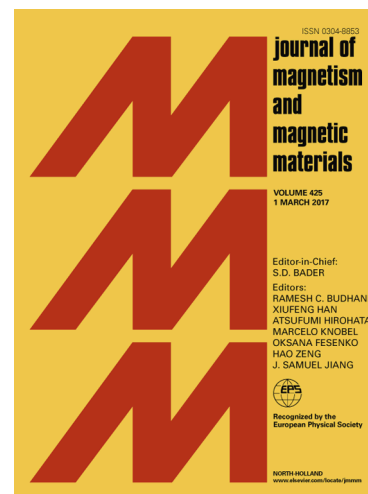
PII: S0304-8853(17)33385-1  
DOI: <https://doi.org/10.1016/j.jmmm.2018.02.052>  
Reference: MAGMA 63729

To appear in: *Journal of Magnetism and Magnetic Materials*

Received Date: 26 October 2017  
Revised Date: 20 December 2017  
Accepted Date: 16 February 2018

Please cite this article as: S.I. El-Dek, M.A. Ali, S.M. El-Zanaty, S.E. Ahmed, Comparative investigations on ferrite nanocomposites for magnetic hyperthermia applications, *Journal of Magnetism and Magnetic Materials* (2018), doi: <https://doi.org/10.1016/j.jmmm.2018.02.052>

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# Comparative investigations on ferrite nanocomposites for magnetic hyperthermia applications

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## Abstract

Superparamagnetic iron oxide nanoparticles (SPION)  $\text{Fe}_3\text{O}_4$  nanoparticles were prepared using different approaches: co-precipitation and sonochemical methods. This article is a comparative study on how different synthesis techniques greatly affect the magnetic properties and heating efficiency of such nanomaterial. Another important issue addressed here is the correlation between microstructure, colloidal stability, magnetization and specific absorption rate (SAR) of the nanoparticles. The results reveal that the sonochemical method for polyethylene glycol (PEGylated)  $\text{Fe}_3\text{O}_4$  with size 5 nm leads to pseudo single domain with smallest loop area. Additionally, large SAR values are obtained within 10-15 mins using low magnetic field.

**Keywords:**  $\text{Fe}_3\text{O}_4$ ; SPIONs; SAR; PEG; magnetization; hyperthermia.

**Abstract word count: 91**

**Total article word counts including reference list: 4979**

**No of tables: 6**

**No of figures: 8**

**No of references: 42**

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