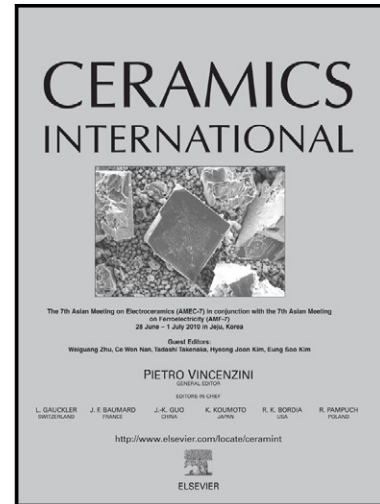


Author's Accepted Manuscript

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www.elsevier.com/locate/ceramint

PII: S0272-8842(14)01146-8
DOI: <http://dx.doi.org/10.1016/j.ceramint.2014.07.091>
Reference: CERI8912

To appear in: *Ceramics International*

Received date: 3 July 2014
Revised date: 17 July 2014
Accepted date: 18 July 2014

Cite this article as: Samira Mandizadeh, Mehdi Bazarganipour, Masoud Salavati-Niasari, A low-cost and eco-friendly viable approach for green synthesis of barium hexaferrite nanostructures using palm oil, *Ceramics International*, <http://dx.doi.org/10.1016/j.ceramint.2014.07.091>

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A low-cost and Eco-friendly Viable Approach for Green Synthesis of barium haxaferrite nanostructures Using Palm Oil

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Abstract

Barium haxaferrite ($\text{BaFe}_{12}\text{O}_{19}$) nanostructures were synthesized by a coprecipitation technique from metal nitrates and palm oil without adding external surfactant, capping agent or template. The effects of processing parameters such as the dosage of palm oil and calcination temperature on the crystalline phase formation and magnetic properties were systematically investigated. The biosynthesized barium haxaferrite nanostructures were characterized by using X-ray diffraction (XRD), scanning electron microscope (SEM) and Fourier transform infrared spectroscopy (FT-IR). The XRD patterns revealed that high calcination temperature and palm oil dosage are beneficial for the formation of barium haxaferrite nanostructures. Products with high coercive force of 5000 Oe and saturation magnetization of 28 emu/g were obtained when the palm oil /nitrates molar ratio and calcination temperature were 26/1 and 900 °C, respectively.

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