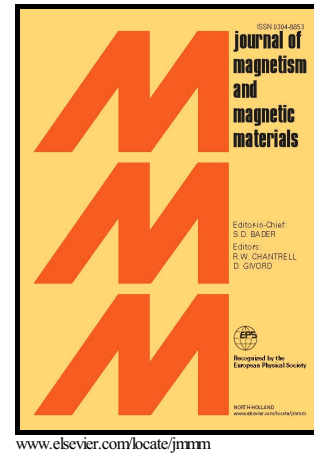


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A review of the magnetic properties, synthesis methods and applications of Maghemite

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A review of the magnetic properties, synthesis methods and applications of Maghemite

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Abstract

It must be pointed out that maghemite ($\gamma\text{-Fe}_2\text{O}_3$) with a cubic spinel structure is a crucial material for various applications, including spin electronic devices, high-density magnetic recording, nano-medicines and biosensors. This paper has to do with a review study on the synthesis methods, magnetic properties and application of maghemite in the form of one-dimensional (1D) nanostructured materials, such as nanoparticles, nanotubes, nano-rods, and nanowires, as well as two-dimensional (2D) thin films. The results revealed that maghemite is widely used in the biomedical applications (hyperthermia, magnetic resonance imaging and drug delivery) and magnetic recording devices. The unmodified and Co/Mn modified maghemite thin films prepared by the dc-reactive magnetron sputtering show the excellent values of coercivity 2100 Oe and 3900 Oe, respectively, for the magnetic storage application. The superparamagnetic particles with 7 nm size and the saturation magnetization of 80 emu/g prepared by the established thermolysis method are good candidates for bio-medical applications.

Keywords: Maghemite, Spinel, Thin film, Nanoparticle,

1. Introduction

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