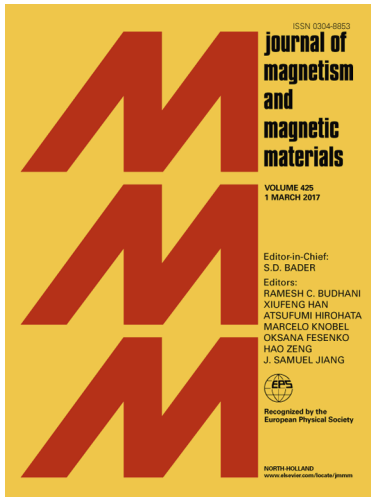

Effect of PEG6000 on magnetic properties of the Mn-Zn ferrite nanoparticles

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Effect of PEG6000 on magnetic properties of the Mn-Zn ferrite nanoparticles

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Abstract: In this paper, PEG6000 was used as a surfactant to prevent the MnZn ferrite nanoparticles from aggregation. Introduction of PEG6000 didn't affect structure of the products, but modified their dispersion state and decreased their particle size. Furthermore, saturated magnetization of the MnZn ferrite nanoparticles increased with an increase in the PEG6000 content, and presented the maximum of 110.3 emu/g at the PEG6000 content of 0.006mol/l. This value is about 40% higher than that without any PEG6000, and almost the highest one reported to date for the MnZn ferrite nanoparticles. Hence the obtained results proved that the PEG6000 was a powerful surfactant to improve magnetic properties of the MnZn ferrite nanoparticles.

Keywords: MnZn ferrite, magnetic materials, magnetic property, PEG6000

Introduction

Mn-Zn ferrites are technologically important materials because of their high magnetic permeability, high saturation magnetization, high resistivity and low core losses[1-4]. However, the ferrites prepared by the conventional high temperature solid-state reactions between the constituent oxides/carbonates are difficult to meet the needs of modern electronic devices in high performance due to large and non-uniform particle size and inducing impurities[5,6]. Accordingly, chemically derived fine powders are strongly expected to adopt. On the other hand, Mn-Zn ferrite nanoparticles are among the most interesting nano-materials, because of their potentially important applications in ferrofluid technology[7,8], biomolecule separation medical diagnosis and treatment[9,10] and so on. Therefore,

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