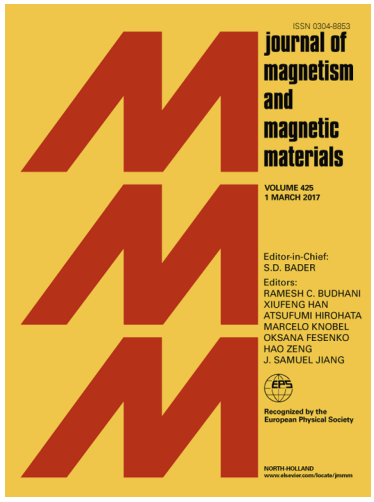

Research articles

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Structural and magnetic properties of $ZnFe_{2-x}In_xO_4$ nanoparticles synthesized by solution combustion method

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Abstract

$ZnFe_{2-x}In_xO_4$ (x=0, 0.05, 0.1 and 0.15) nanoparticles have been prepared by solution combustion synthesis method. The effects of In^{3+} substitution on the cation distribution between tetrahedral and octahedral sites in the spinel structure, and on the magnetic properties were investigated by X-ray diffraction, Raman spectroscopy, Mössbauer spectroscopy and vibrating sample magnetometer methods. The results showed that the indium preferentially occupied the tetrahedral sites and pushed Fe^{3+} cations to the octahedral sites. The magnetic measurements revealed that the saturation magnetization decreased from 11.8 to 2.2 emu/g, because of the reduction in total moments with the In^{3+} substitution and redistribution of cations between the tetrahedral and octahedral sites.

Keywords: Zinc ferrite; Indium; Cation distribution; Magnetic properties;

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