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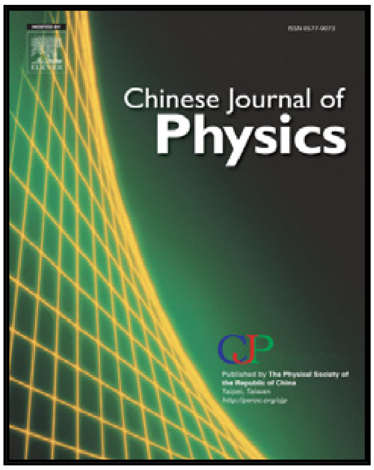

Synthesis, crystal structure and magnetic characterization of Pr^{3+} and Zn^{2+} ions co-doped hexagonal ferrites via the ceramic process

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Synthesis, crystal structure and magnetic characterization of Pr^{3+} and Zn^{2+} ions co-doped hexagonal ferrites via the ceramic process

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Highlights

1. Hexaferrites $Ca_{0.2}Sr_{0.8-x}Pr_xFe_{12-y}Zn_yO_{19}$ (x=0.00-0.40, y=0.00-0.30) were prepared by the ceramic process.

2. Single M-type hexaferrite phase is obtained in all Pr-Zn doped hexaferrites.

3. M_s, M_r and M_r/M_s ratio reach to the maximum values at x=0.24, y=0.18.

4. H_a, K_{eff} and H_c reach to the maximum values at x=0.16, y=0.12.

Abstract

M-type hexaferrites $Ca_{0.2}Sr_{0.8-x}Pr_xFe_{12-y}Zn_yO_{19}$ ($0.00 \leq x \leq 0.40$, $0.00 \leq y \leq 0.30$) were synthesized by the ceramic process. The X-ray diffraction (XRD), field emission scanning electron microscopy (FE-SEM) and a vibrating sample magnetometer (VSM) were used to investigate microstructure and magnetic properties of the M-type hexaferrites. The single-phase with hexagonal structure was obtained in all Pr-Zn substituted M-type hexaferrites, and with increasing Pr-Zn content, the 2θ values of (107) and (114) peaks shifted towards higher angles. With increasing Pr-Zn content, the lattice constant a basically kept unchanged, while the lattice constant c decreased.

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