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Influence of Nd-NbZn co-substitution on structural, spectral and magnetic properties of M-type calcium-strontium hexaferrites $\text{Ca}_{0.4}\text{Sr}_{0.6-x}\text{Nd}_x\text{Fe}_{12.0-x}(\text{Nb}_{0.5}\text{Zn}_{0.5})_x\text{O}_{19}$

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Influence of Nd-NbZn co-substitution on structural, spectral and magnetic properties of M-type calcium-strontium hexaferrites

$\text{Ca}_{0.4}\text{Sr}_{0.6-x}\text{Nd}_x\text{Fe}_{12.0-x}(\text{Nb}_{0.5}\text{Zn}_{0.5})_x\text{O}_{19}$

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Abstract

This is first report on Nd-NbZn co-substituted M-type Ca-Sr hexaferrites with nominal compositions $\text{Ca}_{0.4}\text{Sr}_{0.6-x}\text{Nd}_x\text{Fe}_{12.0-x}(\text{Nb}_{0.5}\text{Zn}_{0.5})_x\text{O}_{19}$ ($x = 0.00-0.32$) fabricated by the conventional solid-state reaction method. X-ray diffractometer (XRD), Fourier transformer infrared (FTIR) spectroscopy, field emission scanning electron microscopy (FE-SEM), physical property measurement system-vibrating sample magnetometer (PPMS-VSM) were employed to characterize M-type calcium-strontium hexaferrites. XRD patterns of the hexaferrites with Nd-NbZn content (x) of $0.00 \leq x \leq 0.16$ showed the single M-type hexaferrite phase. However, for the hexaferrites with Nd-NbZn content (x) ≥ 0.24 , the impurity phase ($\alpha\text{-Fe}_2\text{O}_3$)

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