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M.A. Almessiere, Y. Slimani, A. Baykal



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Structural and magnetic properties of Ce-doped Strontium hexaferrite

M.A. Almessiere^{a,c*}, Y. Slimani^b, A. Baykal^c

^aDepartment of Physics, College of Science, Imam Abdulrahman Bin Faisal University, P.O. Box 1982, 31441 Dammam, Saudi Arabia

^bDepartment of Biophysics, Institute for Research & Medical Consultations (IRMC), Imam Abdulrahman Bin Faisal University, P.O. Box 1982, 31441 Dammam, Saudi Arabia

^cDepartment of Nano-Medicine Research, Institute for Research & Medical Consultations (IRMC), Imam Abdulrahman Bin Faisal University, P.O. Box 1982, 31441 Dammam, Saudi Arabia

*Corresponding author. E-mail: malmessiere@iau.edu.sa (Munirah Abdullah Almessiere). Tel: 00966505807292

Abstract

Ce³⁺ ion substituted Sr-hexaferrite magnetic nanoparticles (MNPs), SrCe_xFe_{12-x}O₁₉ (0.0 ≤ x ≤ 0.5) MNPs, were fabricated by citrate sol-gel combustion approach. All products have been characterized using X-ray diffraction (XRD), Photoluminescence, scanning electron microscopy (SEM), elemental mapping (EDS), transmission electron microscopy (TEM) and vibrating sample magnetometer (VSM) at 300 and 10 K. The XRD pattern presents effective substitution of Ce³⁺ on the sites of strontium hexaferrite lattice. With Ce³⁺ doping, the lattice parameters a is almost unchanged, whereas c is a little increases with increasing the dopant contents. The hysteresis loops M-H showed the ferromagnetic nature of all elaborated. The saturation magnetization (M_s) and the remnant magnetization (M_r) are reduced with increasing Ce amount. All the elaborated products presented typically

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