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Effect of samarium substitution on the structural and magnetic properties of Yttrium Iron Garnet Nanoparticles prepared by Sol-gel Method

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Abstract: In this work, samarium ion (Sm^{3+}) substituted yttrium iron garnet nanoparticles $Y_{3-x}Sm_xFe_5O_{12}$ (x=0.0, 0.2, 0.3) were fabricated by the sol-gel method. X-ray diffraction (XRD) patterns confirmed the pure garnet structure for all samples. The garnet phase were studied, using, Far-FTIR. The results of vibrating sample magnetometer (VSM) represents that saturation magnetization decrease with increasing samarium ion concentration. These changes assigned to the destrucive role of Sm^{+3} ionic size on magnetization of substituted garnet .

Keywords: *Sol-gel; Yttrium Iron Garnet; samarium; vibrating sample magnetometer.*

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