

## Structural and magnetic properties of Yttrium Iron Garnet substituted by Europium Particles Synthesis by Sol-Gel Method

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**Abstract:** In this work, Europium ion ( $\text{Eu}^{3+}$ ) substituted yttrium iron garnet particles  $\text{Eu}_x\text{Y}_{3-x}\text{Fe}_5\text{O}_{12}$  ( $x=0.0, 1.0, 2.0$ ) were synthesized by the sol-gel method. X-ray diffraction (XRD) patterns confirmed the pure garnet structure for all samples. The garnet phase was studied by using Far-FTIR and Raman spectroscopy. The results of vibrating sample magnetometer (VSM) represents that saturation magnetization decrease with increasing Europium ion concentration. These changes assigned to the Neel theory and spin canting after substituting  $\text{Eu}^{3+}$  in yttrium iron garnet.

**Keywords:** Sol-gel; Yttrium Iron Garnet; Europium; Raman Spectroscopy; Vibrating Sample Magnetometer.

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