

Investigating the structural, and Magnetic Properties of Fe₃Se₄ nanoparticles

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In this work, Fe₃Se₄ nanoparticles were synthesized by the solid-state reaction method. The structural properties such as particle size and lattice constant of the material were calculated by X-ray diffraction (XRD). Interestingly, the surface morphology and the element present in the material were characterized by using FESEM with an EDS. The electronic states of the Fe₃Se₄ nanoparticles along with the chemical and elemental composition were analyzed by X-ray photoelectron spectroscopy (XPS). The element present in the sample was confirmed by vibrational bonds in Raman spectra. Gouy's Experiment was performed to find out the magnetic susceptibility of the material. Saturation magnetization, coercivity, and retentivity of the materials were calculated via VSM at room temperature and Low-temperature (15K).