

Effect of Annealing on Magnetic Properties of $\text{SrTi}_{1-x}\text{Co}_x\text{O}_3$ Nanoparticles Prepared by Hydrothermal Method

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Co-doped SrTiO_3 ($\text{SrTi}_{1-x}\text{Co}_x\text{O}_3$) ($x=0, 0.05, 0.1$ and 0.15) nanopowders were synthesized by hydrothermal method. Their morphology and structure were studied by scanning electron microscopy (SEM), transmission electron microscopy (TEM) and X-ray diffraction (XRD). Magnetic properties were measured at room temperature using vibrating sample magnetometer (VSM). All samples show the major phase of a perovskite structure and the nanopowders consist of cubic-like particles with particle sizes in the range of 60- 120 nm. As-synthesized samples exhibit paramagnetic behavior and display the completed saturation ferromagnetic for samples annealed in Argon atmosphere at 800°C for 3 h. The ferromagnetic behavior in the annealed sample with $x = 0.15$ is due to the impurity phase of CoO. However, for annealed samples with $x = 0.05$ and 0.1 , the observed ferromagnetic behavior is originated from the F-center mechanism. The saturation magnetization of annealed samples with $x = 0.05$ and 0.1 are 0.048 and 1.080 emu/g, respectively.

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