

عنوان مقاله:

Role of Praseodymium Addition in the Microstructure and Magnetic Properties of ZnCo Ferrite Nanopowders: Positive
?or Negative

محل انتشار:

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خلاصه مقاله:

In order to investigate the effect of Pr addition on the microstructure and magnetic properties of cobalt-zinc ferrite nanoparticles (NPs), different values of Pr element ($x=0.2$, 0.4 and 0.6) were added to the initial composition ($\text{Co}_{0.6}\text{Zn}_{0.4}\text{Fe}_{2-x}\text{Pr}_x\text{O}_4$) in the co-precipitation method, and the prepared precipitates calcined at 750°C for 2 h. The synthesized powders were characterized by X-ray diffraction (XRD), field emission electron microscopy (FESEM), Fourier transform infrared spectroscopy (FTIR), and vibrating sample magnetometer (VSM). XRD pattern revealed the formation of a secondary phase of Pr-Fe oxide in addition to the ZnCo ferrite phase in the samples. FESEM images showed changes in the morphology and size of the particles by adding Pr to the composition. For specimen with $x=0.2$, the homogeneous spherical like particles with the size about less than 60 nm was formed. Whereas, for composition containing $x=0.6$ of Pr, a non-uniform powder with plate like particles was obtained and NPs had a thickness of approximately less than 30 nm . VSM analysis indicated that by increasing the element Pr to the cobalt-zinc ferrite composition, especially for values higher than $x=0.2$, the powder become a completely non-magnetic material.

کلمات کلیدی:

Cobalt ferrite, Coprecipitation, Cation distribution, Magnetic propertie

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