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Influence of cerium on the structural and electrical properties of some novel ferrite

In this work we report structural and electrical properties of $\text{Co}_{1-x}\text{Cd}_x\text{Ce}_y\text{Fe}_{2-y}\text{O}_4$ ($0.0 \leq x \leq 1.0$; $y=0.0, 0.1$) nanoferrites have been synthesized successfully by novel solution combustion method. Structural investigation was studied using x-ray diffraction (XRD), Fourier infrared spectroscopy (FTIR), Scanning electron microscopy (SEM) and Elemental analysis by x-ray diffraction (EDAX) techniques. The DC electrical conductivity was measured by the two probe method. XRD patterns revealed the formation of cubic spinel structure. The lattice parameter is found to increase with Cd^{2+} ion content due to ionic radius difference. FTIR spectra exhibit two strong absorption bands in wave number range 550 cm^{-1} and 450 cm^{-1} . Scanning electron micrographs of the nanoferrites showed agglomerate and spherical in shape. Moreover, the Curie temperature decreases and impedes the conduction with Cd^{2+} ions Ce^{3+} ion and substitution.

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