Flux Growth of $CoFe_{1.9}Dy_{0.1}O_4$ Single Crystalsand its Magnetic Properties

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Abstract

We studied the effect of Dy content on the magnetic properties of cobalt ferrite single crystal. The $CoFe_{1.9}Dy_{0.1}O_4$ single crystals were grown by the flux method by using $Na_2B_4O_7.10H_2O$ (Borax) as a solvent (flux). The black and shiny single crystals were obtained as a product. The X-ray diffraction test at room temperature confirmed the spinel cubic symmetry with lattice constant a = 8.42Å of the single crystals. The presences of constitute elements (Co, Fe and Dy) was endorsedby EDAX analysis. The saturation magnetization (*Ms*) of $CoFe_{1.9}Dy_{0.1}O_4$ single crystals was measured and is found to be 72emu/g or equivalently 3.2μB/f.u. at 300 K. The observed Ms and coercivity (Hc) is found to be lower than that of pure $CoFe_2O_4$.

Keywords: Ferrites; X-ray diffraction; Magnetic Properties.

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