

عنوان مقاله:

Synthesis of BiFeO₃ nanoparticles by the reverse chemical co-precipitation method: Influence of pH and study of the reaction mechanism

محل انتشار:

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خلاصه مقاله:

The reverse co-precipitation method was used for synthesis of the pure phase multiferroic BiFeO₃ (BFO) nanoparticles. Influence of different pH value on the purity of bismuth ferrite powders was investigated. Thermogravimetric-differential thermal analysis (TGDTA) technique indicated that the optimal temperature for calcination is 550°C. Atomic ratio of Bi to Fe is approximately 1:1 for BiFeO₃ powders, as determined by energy dispersive spectroscopy (EDS). The phase formation and the existence of transient phases (like Bi₂5FeO₃9 and Bi₂Fe₄O₉) has been studied using X-ray diffractometry (XRD). The morphological features of the nanopowders were characterized by field emission scanning electron microscopy (FESEM). The magnetic properties of the synthesized powders were measured using vibrating sample magnetometry (VSM). The results showed that the BFO powders have R₃c crystal structure. The FESEM micrographs showed pseudo-cubic shape and particles size in the range of 25-234 nm. The magnetic hysteresis loops were indicated a weak ferromagnetic behavior of the samples at room temperature.

کلمات کلیدی:

Reverse co-precipitation; Bismuth ferrite; Magnetic properties

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