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Effect of temperature and concentration of bismuth nitrate mole on structural, magnetic and photocatalytic properties of bismuth ferrite

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Abstract: In this research, the effect of temperature and concentration of bismuth nitrate mole on structural, magnetic and photocatalytic properties of the bismuth ferrite nanoparticles prepared by nitrate-citrate method have been investigated. The structural and magnetic properties were characterized by X-ray diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR) and vibrating-sample magnetometer at room temperature. An important role in the synthesis of pure bismuth ferrite is played by temperature and excess bismuth oxide. Analysis of XRD patterns and FTIR data indicate that to obtain the pure bismuth ferrite, a stoichiometric amount of bismuth nitrate mole in solution and sintering at temperature 650 °C is needed. The magnetic and photocatalytic results have showed that the presence of the impurity phases led to strong ferromagnetic behavior in samples, but has a negative effect on the photocatalytic properties of bismuth ferrite.

Keywords: *Nanoparticles; bismuth ferrite; citrate method; structural, magnetic and photocatalytic properties*

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