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# Influence of synthesis experimental parameters on the formation of magnetite nanoparticles prepared by polyol method

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## Abstract

In this paper we present a modified polyol method for synthesizing magnetite nanoparticles using iron (III) nitrate, a low toxic and cheap precursor salt. The influence of the precursor salt nature and initial ferric concentration in the average particle size and magnetic properties of the obtained nanoparticles were investigated. Magnetite nanoparticles have received much attention due to the multiple uses in the biomedical field; for these purposes nanoparticles with monodisperse size distribution, superparamagnetic behavior and a combination between small average size and high saturation magnetization are required. The polyol conventional method allows synthesizing water-dispersible magnetite nanoparticles with these features employing iron (III) acetylacetonate as precursor salt. Although the particle sizes of samples synthesized from the conventional polyol method (denoted CM) are larger than those of samples synthesized from the modified method (denoted MM), they display similar saturation magnetization. The differences in the nanoparticles average sizes of samples CM and samples MM were explained through the known nanoparticle formation mechanism.

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