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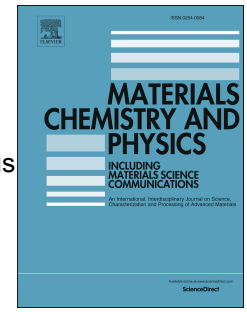

Magnetite nanoparticles synthesized by co-precipitation method; the effects of various iron anions on specifications

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Magnetite Nanoparticles Synthesized by Co-precipitation Method; the Effects of Various Iron Anions on Specifications

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Abstract

Magnetite nanoparticles due to the special specifications have been widely used in medical as well as industrial applications. In such applications, it is important to control morphology and size of the nanoparticles. In this work, magnetite nanoparticles were synthesized via the co-precipitation method. For investigating the effect of various precursors on mean size and morphology of synthesized nanoparticles, six groups of magnetite precursors were arranged. The magnetite product of each group was characterized by using XRD, SEM, TEM, VSM and the analytical methods. The results have shown the kind of precursors influence on the mean size of the synthesized nanoparticles. The reason for this behavior was explained by the double layer theory. However, kind of precursors did not have a sensible effect on the morphology of the synthesized nanoparticles.

Key words: Magnetic materials; Nanostructures; Precipitation; Electron microscopy; Magnetometer; Nucleation

1. Introduction

Preparation of magnetic nanoparticles with proper size and shapes are one of the important topics in the field of nanotechnology. Due to abundant applications, many studies have been conducted on magnetite nanoparticles in the past two decades. The precise control of the particle size is the main challenge in the synthesis of magnetic nanoparticles [1-2]. Having specific properties such