

SYNTHESIS AND CHARACTERIZATION OF NANOPARTICLES OF IRON BY THE METHOD OF COPRECIPITATION

Adrielle de Sousa Nascimento^{a*}, Ossalin de Almeida^a, Antônio Maia de Jesus Chaves Neto^b

^aFaculty of Chemistry, ^bFaculty of Physics, Institute of Exact and Natural Sciences, Federal University of Pará, 66075-110 Belém - PA, Brazil

adriellesousa@live.com

Abstract. The objective of this study was to synthesize nano magnetic particles (NPMs) of iron oxide (magnetite) by the method of coprecipitation of Fe²⁺ and Fe³⁺ ions in alkaline medium. The magnetic nanoparticles were evaluated according to the parameters, pH, concentration and temperature in order to choose the best conditions used to obtain NPMs. The samples were characterized by X-ray diffractometry (XRD), scattered retro-scanning electron microscopy (SEM / EDS) and zeta potential. The results suggest that coprecipitation produces particles with high dispersion polydispersion and that the synthesis parameters drastically influence the properties of the materials, however, all samples exhibited magnetic characteristics. As for temperature, the best result was obtained at room temperature (28.5 ° C), higher temperatures indicated structures characteristic of other iron compounds. In general, it can be considered that the products formed are crystalline and consist mainly of magnetite (Fe₂O₃). The measurements of the mean diameters of the NPMs were obtained by the Debye-Scherrer method, with average values above 70 nm, being in agreement with the results obtained by scanning electron microscopy (SEM).

Key words: Ferromagnetic, Coprecipitation, Functionalization.