Physico-Chemical nanomaterials science

Electrokinetic properties of colloidal silica nanoparticles with magnetic core

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Many works are devoted to electrokinetic properties of α-Fe_2O_3 oxides [1]. In this work we present properties of other iron oxides, such as: γ-Fe_2O_3 or Fe_3O_4 and their nanocomposites. Three-step reaction was carried out in order to obtain functionalized silica colloids with magnetic properties. Aqueous suspension of iron oxides nanoparticles as magnetic core (mainly maghemite – γ-Fe_2O_3) were obtained by Massart's method [2]. A silica shell was obtained onto maghemite employing a modified sol-gel method by Salgueirino [3].

In this work we present electrokinetic properties of the synthesized nanoparticles composed of magnetic core and silica shell. Effect of pH and ionic strength on the electrokinetic properties of the above-mentioned nanocomposites were examinated. The obtained results show that with increasing pH, value of zeta potential (of all tested nanocomposites) decreases. All measurements were carried out using dynamic light scattering technique, in a ZetaSizer 3000 (Malvern, U.K.).

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