Turkish Journal

of

Chemistry

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Turkish Journal of Chemistry

Preparation and characterization of magnetic chitosan nanospheres

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Abstract: A method for the preparation of magnetite/chitosan composite nanoparticles was developed. Colloidal magnetite particles (Fe_3O_4 produced by co-precipitation and stabilized in suspension by adding a non-ionic surfactant (Pluronic F127) were subsequently covered with a layer of chitosan (CS) prepared by ionotropic gelation using sodium tripolyphosphate (STPP) as a crosslinking agent. The products were characterized in terms of the following parameters: size distribution and ζ-potential (by laser diffraction analysis), surface morphology (TEM), composition (FTIR, elemental analysis), magnetic properties (magnetic susceptibility analysis), and concentration of surface functional groups (potentiometric titration). The synthesis parameters were optimized for obtaining uniformly distributed colloidally stable, biocompatible magnetic nanoparticles with a high concentration of surface amino groups available for subsequent attachment of biologically active ligands.

Key Words: Chitosan, magnetite, magnetic particles, biocompatible.

Turk. J. Chem., **33**, (2009), 785-796.
Full text: pdf
Other articles published in the same issue: Turk. J. Chem.,vol.33,iss.6.