STRUCTURAL INVESTIGATION OF MAGNETITE AND COBALT FERRITE MESOPOROUS NANOPARTICLES COATED WITH AMINO ACIDS AS STABILIZING ACENTS

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In this paper the magnetite and cobalt ferrite mesoporous nanoparticles synthesized by co-precipitation method using various stabilizing agents such as: L-aspartic acid, L-proline and L-asparagine are investigated by means of small-angle neutron and X-ray scattering methods.
For preparation of mesoporous magnetite, the following precursors have been used: sodium hydroxide – NaOH (Silal Trading), iron (III) chloride – FeCl3 (Sigma-Aldrich), ammonium iron (II) sulphate hexahydrate – Fe(NH4)2(SO4)2 .6H2O (Silal Trading), L-proline C5H9NO2 (Riedel-De Haën Ag Seelze-Hannover), L-aspartic acid C4H7NO4 (Merck), L-asparagine C4H8N2O3 (Sigma). Earlier investigation [1] by using Fourier Transform InfraRed Spectroscopy (FTIR), powder X-ray diffraction (XRD), Brunauer– Emmett–Teller (BET) and scanning electron microscopy (SEM) of the use of L-asparagine, L-aspartic acid, L-proline as stabilizing agents of the magnetite core have shown important morphological changes which can be exploited in medical applications.

[1] I.L. Ardelean, D. Ficai, A. Ficai, G. Nechifor, D. Dragu, C. Bleotu (2018). Synthesis and characterization of new magnetite nanoparticles by using the different amino acids such as stabilizing agents, U.P.B. Sci. Bull., Series B, 80(1), 33-46.