

SYNTHESIS AND CHARACTERIZATION OF MAGNETOFERRITIN

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The paper presents detailed experimental study of the synthesis and characterization a bioinorganic magnetic molecule - magnetoferritin. Addition of increments of Fe(II) to anaerobic solutions of apoferritin, at pH = 8.6 and 65°C, followed by stoichiometric amounts of the oxidant results in the formation of magnetoferritin. Product was determined spectrophotometrically. The amount of iron was measured at $\lambda = 450$ nm and the content of protein was detected by modified Bradford method at $\lambda = 595$ nm. Magnetoferritin with loading of iron atom per protein molecule was in the range from 300 to 2000. The structural characterization of the inorganic cores was determined by TEM and X-ray diffraction. Hydrodynamic diameter of the nanoparticles was determined by non-invasive back scatter technology. Magnetic properties were investigated by a SQUID magnetometer. The thermomagnetic curves measured after cooling the sample in zero field and under the presence of the measurement field show superparamagnetic behavior with the blocking temperature T_b around 25 K. The magnetization loops measured below T_b (at 2 K) have the hysteresis with coercive field from 16 to 36 kA/m depend on the concentration of the magnetic nanoparticles.

9.7 cm

13.4 cm

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