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Hybrid system «layered magnesium silicate – chlorin e_6 13(1), 17(3)-*N,N′*-(2-hydroxyethyl)diamide 15(2)-methyl ester»

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Abstract

Hectorite type layered magnesium silicate have been synthesized by heat treatment of reaction mixture freshly prepared magnesium hydroxide suspension, silica sol, lithium fluoride solution. The starting $Mg(OH)_2$: SiO_2 : LiF molar ratio was 1 : 1.51 : 0.25. Hybrid systems have been synthesized by heat treatment of synthetic layered magnesium silicate in water-ethanol solution of chlorin e_6 13 (1), 17(3)-*N,N′*-(2-hydroxyethyl) diamide 15(2)-methyl ester. The systems contain of $0.85 \cdot 10^{-6}$ and $1.4 \cdot 10^{-6}$mol of the organic component per 1 g of layered magnesium silicate. The introduction of the chlorin e_6 derivative into hectorite type layered magnesium silicate sol promotes the aggregation processes and growth particles of the hybrid samples (250±5 nm), as compared with the particles of magnesium silicate (133±1 nm). X-ray phase analysis, UV-Vis spectroscopy and laser Doppler electrophoresis studies have been allowed to establish that non-aggregated molecules of the chlorin e_6 derivative are located on the surface of magnesium silicate particles.UV-Vis spectroscopy study showed protonation of nitrogen atoms of the chlorine macrocycle of the chlorin e_6 derivative molecules (Soret band 405-406 nm; Q-band 642-643 nm) by hydroxyl groups of the layered magnesium silicate. Chlorin e_6 13 (1), 17(3)-*N,N′*-(2-hydroxyethyl) diamide 15(2)-methyl ester sorption on the surface of magnesium silicate particles occurs due to electrostatic interaction between protonated chlorine e_6 derivative molecules and ionized hydroxyl groups of the magnesium silicate.

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