

Title: Preparation of magnetic and optical nanoparticles

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Abstract: In the present work we study methods of preparation of magnetic and optical nanoparticles by hydrothermal method. Specifically, we prepared particles of cobalt ferrite (CoFe_2O_4) and sodium yttrium fluoride (NaYF_4) doped by Yb^{3+} and Er^{3+} from corresponding nitrates in the system of water - ethanol - oleic acid, and in modified systems. By this method, it is possible to prepare particles of narrow size distribution (monodisperse particles). Prepared particles of ferrite show superparamagnetism and particles of NaYF_4 up-conversion, i.e. conversion of infrared (980 nm) to visible light.

Keywords: nanocrystals, superparamagnetism, up-conversion, CoFe_2O_4 , NaYF_4 , hydrothermal synthesis