

INVESTIGATION OF MORPHOLOGY AND MAGNETIC PROPERTIES OF COBALT NANOPARTICLES PREPARED USING MICROEMULSION TECHNIQUE

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ABSTRACT

Among many ferromagnetic materials cobalt nanoparticles with high coercivity and small grain size are one of the potential candidates having application in high-density storage media manufacturing. Magnetic cobalt nanoparticles have been synthesized via microemulsion technique to control the shape and size of high quality magnetic nanoparticles. In this technique, cetyltrimethylammonium bromide (CTAB) was added as surfactant to control the particle size. The morphology and magnetic properties have been characterized before and after annealing by X-ray diffraction, transmission electron microscopy and vibrating sample magnetometer. The hysteresis measurement of as prepared sample exhibits a coercivity of 27.26 Oe at room temperature. Annealing the sample at 400 °C enhance magnetic properties and change the crystal structure of particles from hcp to fcc.

Keywords: cobalt; nanoparticles; microemulsion; coercivity

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