Abstract Submitted
for the TSF16 Meeting of
The American Physical Society

Optical and magnetic properties of cobalt nanoparticles fabricated by high temperature reduction of cobalt salt HARI BHATTA, University of North Texas, ALI ALIEV, University of Texas at Dallas, VLADIMIR DRACHEV, University of North Texas — Magnetic nanoparticles have attracted great amount of enthusiasm among scientists from various fields because of their technological applications include data storage, magnetic fluids, catalysis and biomedical applications include magnetic resonance imaging (MRI), drug delivery, gene cloning, and hyperthermia for cancer therapy. The cobalt nanoparticles were fabricated by the method of high temperature reduction of cobalt salt using trioctylphosphine as a surfactant, oleic acid as a stabilizer, and lithium triethylborohydride as a reducing reagent. The formation of cobalt nanoparticles was confirmed by Energy-dispersive X-ray spectroscopy (EDX) analysis. Transmission electron micrographs show the formation of spherical cobalt nanoparticles having average particle size 8.7 nm. As synthesized cobalt nanoparticles showed the high quality plasmon resonance at 275 nm. Time dependent study showed the cobalt nanoparticles dispersed in hexane are stable in the solution. The magnetic measurements show the superparamagnetic behavior of cobalt nanoparticles with blocking temperature corresponding to mixture of fcc and hcp structures.

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Date submitted: 19 Sep 2016 Electronic form version 1.4