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**Temperature and size dependent magnetic hyperthermia studies of Dextran coated $Fe_3O_4$ and $Co_xFe_{3-x}O_4$ ferrofluids** H. NEMALA, M. PALIHAWADANA ARACHCHIGE, G. LAWES, Department of Physics and Astronomy, Wayne State University, Detroit, Michigan, 48202, V.M. NAIK, Department of Natural Sciences, University of Michigan-Dearborn, Dearborn, Michigan, 48128, R. NAIK, Department of Physics and Astronomy, Wayne State University, Detroit, Michigan, 48202 — Magnetic hyperthermia (MHT) using magnetic nanoparticles (MNPs) is a promising technique for cancer therapy. The dominant mechanism of heat generation in MHT using superparamagnetic MNPs is the Néel relaxation in response to an applied ac magnetic field. The efficiency of heating depends on the particle size, particle size distribution and the intrinsic magnetic properties of the MNPs. In this study, we have prepared $Fe_3O_4$(8-14 nm) and $Co_{0.1}Fe_{2.9}O_4$ (10 nm) MNPs by the co-precipitation method and characterized using XRD, TEM, Zeta potential and DC magnetometry measurements. The MNPs are found to be polydispersed and form stable colloidal suspensions in weakly basic solutions (zeta potential $\sim$ -20 mV) with their hydrodynamic radii ranging from 80 to 120 nm. The specific power loss (SPL) was determined as a function of temperature using MHT measurements (140-235 Oe and 188-375 kHz) by incorporating heat losses due to nonadiabatic sample conditions. The SPL values at 298 K measured with 235 Oe and 375 kHz range from 20-95 W/g for the MNPs, and SPL monotonically decrease with increasing in temperature. The results are in agreement with the linear response theory. Details of the measurement and analyses will be presented.

Humeshkar Nemala
Department of Physics and Astronomy,
Wayne State University, Detroit, Michigan, 48202

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