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Magnetic hyperthermia in frozen and liquid ferrofluids R. REGMI, Wayne State University, A. NAIK, University of Wisconsin, J.S. THAKUR, Wayne State University, P.P. VAISHNAVA, Kettering University, G. LAWES, Wayne State University — We report magnetic hyperthermia in dextran coated Fe_3O_4 nanoparticles suspended in an aqueous solution over a temperature range from -40 ^oC to +40 ^oC to investigate heating mechanisms in the solid and liquid states. We used an alternating magnetic field of 70 Oe at frequency of 395 kHz to produce heating in the 12 nm Fe_3O_4nanoparticles. We found that at the lowest and highest temperatures, ambient heat flow to or from the environment produced small but non negligible effects. After correcting for this ambient heat flow, we found an average magnetic heating of 4.7 W/g, 11.2 W/g, and 6.5 W/g in the solid, mixed solid-liquid, and liquid phases, respectively. These values in the solid and liquid phases are consistent for models for magnetic heating considering Neel heating only and Neel and Brownian heating together, respectively.

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