

Abstract Submitted
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Magnetic field, frequency and concentration dependent electromagnetic heating by magnetic nanoparticles VIKASH MALIK, TANYA PROZOROV, SURYA MALLAPRAGADA, RUSLAN PROZOROV, Ames Laboratory, Ames IA-50010 — Measurements of electromagnetic heating of magnetic nanoparticles subject to radio frequency high amplitude AC magnetic field provide important insight into the fundamental physics of individual particles as well as their collective behavior. By using different frequencies and magnetic field amplitudes and comparing with the standard DC measurements performed using SQUID magnetometer, we were able to estimate transient coercivity and hysteresis of unrelaxed magnetic state of the nanoparticles. Moreover, comparing different types of nanoparticles (varying chemical composition, containing medium, particle concentration, shape, size and protective coating) we can discuss the influence of these parameters on the hysteretic performance and provide arguments toward optimization of these parameters for practical application, for example in hyperthermal treatment. This work was supported by the Department of Energy Office of Science, Basic Energy Sciences under Contract No. DE-AC02-O7CH11358.

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