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Characterization of ultrasonically prepared γ-Fe_2O_3-Al_2O_3 shell-core nanocomposites MATTHEW VANNETTE, JOSHUA HUGEN, DANIEL STOECKLEIN, BRETT MCCARTY, RUSLAN PROZOROV, Ames Lab/Dept. of Physics and Astronomy, Iowa State University — High intensity ultrasonic irradiation (sonication) of slurries of Al_2O_3 nanopowder in an $Fe(CO)_5$/decane mixture produce superparamagnetic γ-Fe_2O_3 shells on non-magnetic cores. In this contribution we discuss the effect of the various adjustable parameters (sonication time and intensity, powder loading, and $Fe(CO)_5$:decane ratio) on the dc and ac magnetic properties of these composite materials. Effects of post production modification such as heat treating powders and cold pressing pellets is also presented for a subset of samples.

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