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Synthesis of Barium hexaferrite nanoparticles for functional multilayers S.L. MORROW, N.A. FREY, S. SRINATH, H. SRIKANTH, Functional Materials Laboratory, Physics Department, University of South Florida, — Magnetic barium ferrite ($BaFe_{12}O_{19}$or BaM) nanoparticles were synthesized by a two system microemulsion process. X-ray diffraction of these nanoparticles confirmed the presence of a dominant hexagonal BaM phase. The magnetic characterization of the nanoparticles was performed using a Physical Properties Measurement System (PPMS). The M-H hysteresis of the BaM, at 5K and 300K, displays a saturation magnetization of $\sim$ 68 emu/g, 48 emu/g and large coercivities of $\sim$ 2300 Oe, 3100 Oe respectively, consistent with bulk BaM. The zero field cooled (ZFC) and field cooled (FC) curves illustrate that superparamagnetism was not present in the BaM below 300K. These particles will be used to prepare multilayers of ferroelectric and ferromagnetic films by depositing on a ferroelectric polymer (polyvinylidene fluoride) matrix using the Langmuir-Blodgett technique. The functional properties of these multilayers will be discussed. Work supported by NSF grant #CTS-0408933 and NSF Integrated Interdisciplinary Nanoscience REU DMR 0243997.

S. L. Morrow
Functional Materials Laboratory, Physics Department, University of South Florida,

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