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Progress towards Growth and Characterization of Rare-Earth Nanoparticles using the Inverse Micelle Method[1] DULCE G. ROMERO, PEI-CHUN HO, Department of Physics, Cal. State U., Fresno — Nano-sized particles and clusters have promising electrical, chemical, and magnetic properties as compared to the bulk materials. Due to their reduced dimensionality, it makes their physical properties significantly different from the bulk material. The nano-sized materials have great potential for technical applications, such as, magnetic information storage, imaging, medical devices, and magnetic refrigeration. In this report, we will present the preliminary results on the growth and characterization of rare-earth metallic nanoparticles of Gd and Nd synthesized by the inverse micelle method [1]. These results will be compared to the bulk properties of Gd and Nd, as well as, to those exhibited by metallic nanoparticles, such as Co (by inverse micelle), and Gd (by laser evaporation cluster source), which have been found to show superparamagnetic behavior, enhanced magnetization, and self-organization [2-4]. [1] X.M. Lin, et al. Langmuir. 14, 7140 (1998). [2] D.C. Douglass, et al. Phys. Rev. B. 47, 19 (1993). [3] C. Petit, et al. Advanced Materials. 10, 259 (1998). [4] J.P. Chen, et al. Phys. Rev. B. 51, 11527 (1995).

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