Abstract Submitted
for the CAL12 Meeting of
The American Physical Society

**Synthesis of Gadolinium and Neodymium Nanoparticles through the Reverse Micelle Method**[1] RYAN FUKUDA, MAYA CASTRO DE LA TORRE, PEI-CHUN HO, Physics/California State University Fresno, SAEED ATTAR, MELISSA GOLDEN, Chemistry/California State University Fresno, DENNIS MARGOSAN, United States Department of Agriculture-Agriculture Research Service — Nanotechnology is a growing field that can be applied to several technologies such as electronics and medicine. Due to micro-scale materials reaching their limit, nano-scale development of materials is becoming the new focus. In reaction to this trend, our lab has aimed to synthesize Gd and Nd nanoparticles through the reverse micelle method. This method uses a molecule with a polar head and nonpolar tail, known as a surfactant, to form and contain nanoparticles. In this study, we used the surfactant Aerosol OT (AOT) with polar methanol and nonpolar hexane. The geometry of AOT's two nonpolar tails favors the formation of reverse micelles in a hexane solution containing small "pools" of methanol. The "pools" contain the rare earth compounds that are reduced by using sodium borohydride as a reduction agent. Samples have been examined using scanning electron microscopy, energy dispersive x-ray analysis, and a Leica microscope. The reduction of gadolinium chloride has been confirmed, but is not seen in spherical particles. The same procedure was used for neodymium chloride and neodymium nitrate, but further testing is required. Future work will be done to improve the purity of our sample, generate spherical reverse micelles, and develop smaller particles.

[1]This project is supported by NSF under Grant No. DMR 1104544.

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Date submitted: 19 Oct 2012 Electronic form version 1.4