Abstract Submitted
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**Method for the Growth and Stabilization of Rare Earth Nanoparticles**[1] PATRICK TALBOT, PEI-CHUN HO, Cal State Univ- Fresno — Quantum confinement refers to when the motion of a particle is restricted to length scales on the order of its DeBroglie wavelength, which for this project is on the order of nanometers. This confinement creates energy bands that restrict the states that the particle can exist in and this restriction manifests itself in different ways. We are interested in how this quantum confinement affects the magnetic and electrical properties of gadolinium and neodymium. However, before we can study these effects we must first develop a process to produce these rare earth nano-particles, (NPs), as well as stabilize them against the ambient environment. Rare earth metals in general have a relatively high redox potential compared to most other transition metals, and because of this require a powerful reducing agent as well as the need to be protected from the ambient environment. A growth method under development is the use of solvated electrons in tetrahydrofuran to perform the reduction [1] since electrons are one of the strongest reducing agents around. As for stabilizing these NPs against the ambient environment, we are investigating the use of surfactants to encapsulate and pacify these NPs within a micelle structure. [1]J. A. Nelson, et al., J. Am. Chem. Soc. **124** 2979 (2002).

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