Abstract Submitted
for the TSF10 Meeting of
The American Physical Society

Synthesis and Modification of Selected Rare Earth Nanoparticles
DIVYA GUTHIKONDA, Department of Chemistry, UTSA, ROBERT DENNIS, Department of Physics and Astronomy, UTSA, MAOGEN ZHANG, Department of Chemistry, UTSA, KELLY NASH, Department of Physics and Astronomy, UTSA, WALDEMAR GORSKI, Department of Chemistry, UTSA — The goal of this research is to develop multifunctional nanomaterials for biological applications. The rare earth based nanoparticles (RENPs) have a potential to offer multiple modalities, which can be utilized in more comprehensive imaging of biological tissues. The specific goal was to modify the RENPs with clusters of transition metals in order to enhance their luminescence signal. The luminescent system based on the Er^{3+}:Y_2O_3 nanoparticles (NPs) was selected for the present studies. Several synthetic approaches were investigated in order to control the size and shape. The precipitation from homogenous solution using the urea decomposition yielded perfectly spherical Er^{3+}:Y_2O_3 with narrow size distribution and particle diameter of approximately 250 nm. The synthesis of Er^{3+}:Y_2O_3 using the microemulsion precipitation resulted in the irregularly shaped NPs with the average diameter of approximately 100 nm. The Er^{3+}:Y_2O_3 NPs surrounded by chitosan shell were modified with gold clusters in order to enhance their luminescence by metallic surface plasmon resonance. The luminescence of such [Er^{3+}:Y_2O_3][Chitosan-Au] hybrid NPs was investigated as a function of the gold content in the chitosan shell.

Divya Guthikonda
Dept of Chemistry, UTSA

Date submitted: 24 Sep 2010 Electronic form version 1.4