Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Polymer Assisted Core-shell Ag-C nanoparticles Synthesis via Green hydrothermal Technique JAMES WILLIAMS, SANJAY MISHRA, The University of Memphis, Memphis, TN — Core-Shell Ag-C nanoparticles were synthesized in the presence of glucose through a one-pot green hydrothermal wet chemical process. An aqueous solution of glucose and Ag nitrate was hydrothermally treated to produce porous carbonaceous shell over silver core nanoparticles. The growth of carbon shells was regulated by either of the polymers (poly) vinyl pyrrolidone (PVP) or poly vinyl alcohol (PVA). The two polymers were compared to take a measure of different tunable sizes of cores, and shells. The effects of hydrothermal temperature, time, and concentration of reagents on the final formation of nanostructures were studied using UV-vis extinction spectra, transmission electron microscope, and Raman spectroscopy. The polymer molecules were found to be incorporated into carbonaceous shell. The resulting opacity of the shell was found to be hydrothermal time and temperature dependent. The shell structure was found to be more uniform with PVP than PVA. Furthermore, the polymer concentration was found to influence size and shape of the core-silver particles as well. The core-shelled nanoparticles have surfaces with organic groups capable of assembling with different reagents that could be useful in drug-delivery, optical nanodevices or biochemistry.

Sanjay Mishra
The University of Memphis, Memphis, TN

Date submitted: 24 Nov 2008 Electronic form version 1.4