

# Synthesis of Nanoparticles for the use of Hydrogen Storage

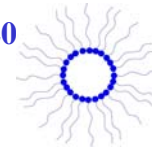
Jennifer Nelson and James Adair

Fuel cells have seen increased interest as a power source due to a more environmentally friendly nature. Large amounts of power can be produced without the use of fossil fuels, producing only water as the byproduct. In the near future, natural resource guzzlers such as the automobile will run predominantly on fuel cells. A major issue in the development of safe and practical fuel cells is hydrogen storage. This project is centered on the synthesis of nanoparticles to be used as hydrogen storage, thus far we have synthesized Mg, spherical Pd, and platelet Pd. Na

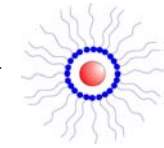
## Pd Spherical<sup>2</sup>

Igepal™ CO-520

cyclohexane



0.04 M Pd in H<sub>2</sub>O



Micelle broken with ethanol

4nm-15nm Pd nanoparticles have been produced

## Pd Platelet Particles<sup>1</sup>

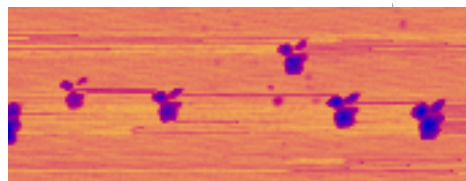
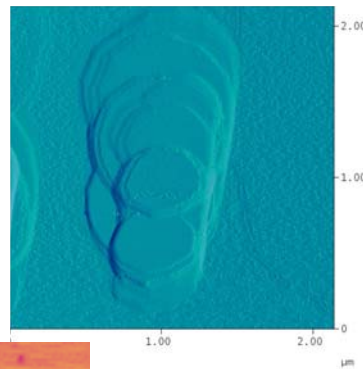
Octalamine/Amylamine Bilayer System

0.04M Pd(NO<sub>3</sub>)<sub>2</sub> (aq)

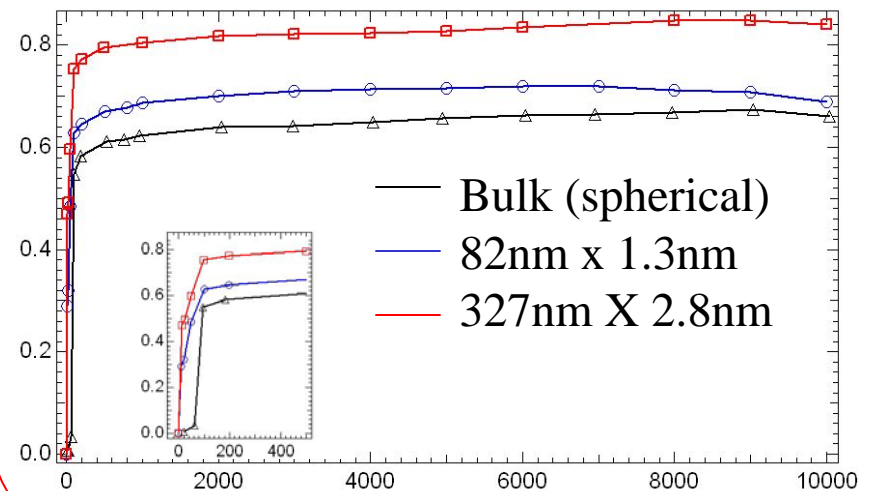
Reduction (Hydrazine Hydrate)

Equilibration (~24 hrs)

Solvent Extraction



## Hydrogen Adsorption of Nanoplatelet Pd



1. Yener et al. Langmuir **2002**, 18, 8692-8699
2. Li et al. Langmuir **1999**, 15, 4328-4334