Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Dumbbell-like Composite Nanoparticles: Chemical Synthesis and Catalytic Applications[1] CHAO WANG, SHOUHENG SUN, Brown University, NANOMATERIALS LAB TEAM[2] — Dumbbell-like NM-Fe_3O_4 (NM=Au, Ag, Pt and Pd) nanoparticles are synthesized by epitaxial growth of Fe_3O_4 on noble metal nanoparticle seeds in organic solution. The size of the noble metal and Fe_3O_4 particles in these dumbbell structures can be well controlled (from 2 nm to 20 nm). These dumbbell nanoparticles are superparamagnetic at room temperature, and also show plasmonic absorption (from Au or Ag). Compared to the single-component noble metal nanoparticles, the dumbbell particles show enhanced catalytic properties, like Pt-Fe_3O_4 for oxygen reduction and methanol oxidation in the fuel cell, as well as Au-Fe_3O_4 for the growth of silicon nanowires.

[1]NSF/DMR.
[2]Department of Chemistry and Division of Engineering, Brown University, Providence, RI 02912, USA

Chao Wang
Brown University

Date submitted: 21 Nov 2006 Electronic form version 1.4