Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Ferromagnetic multipods fabricated by solution phase synthesis and hydrogen reduction[1] YUCHENG SUI, YAO ZHAO, JUN ZHANG, SITARAM JASWAL, XINGZHONG LI, DAVID SELLMYER, Department of Physics and Astronomy and NCMN, University of Nebraska, Lincoln, NE, 68588-0113 — New functional materials might emerge if nanocrystals of higher complexity than those with simple geometries (spheres, rod, discs) could be produced. Branched nanostructures (called multipods) have attracted much attention owing to their potential as building blocks in the fabrication of complex, multi-terminal devices through self assembly. In this work, we demonstrate that ferromagnetic Co multi-branched nanostructures can be produced through the combination of solution-phase synthesis and hydrogen reduction. The CoO multipods were produced through the pyrolysis of cobalt-oleate in octadecane at 280^oC in the presence of oleic acid under the protection of pure nitrogen. Arm lengths and diameters of the CoO multipods are about 30 and 10 nm respectively, and the angles between the nearest arms are 90 degrees. The multipods were assembled onto Si substrates, and after reduction in flowing hydrogen gas at 290^oC, pure cobalt with hexagonal crystal structure and multi-branched structures were created. Anisotropic magnetic properties were found for cobalt multipods. The growth mechanism of CoO multipods will be presented in this work.

[1]This work is supported by DOE, NSF-MRSEC, NRI and NCMN

Yucheng Sui
Department of Physics and Astronomy and NCMN,
University of Nebraska, Lincoln, NE, 68588-0113

Date submitted: 29 Nov 2006 Electronic form version 1.4