

Abstract Submitted
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Chemical Preparation and Characterization of Elemental Cu, Ni, and Cu/Ni Core/Shell Nanoparticles LAURA HIGGINS, MICHAEL LATTANZI, BRIAN KELLY, University of Delaware, GERALD POIRIER, Princeton University, KARL UNRUH, University of Delaware — Elemental Ni, Cu, and Cu core/Ni shell nanoparticles have been prepared in a polyol-type process. The elemental nanoparticles were prepared by dissolving $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$ and/or $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ in ethylene glycol (EG) and heating the solution to reflux prior to the addition of NaOH. The resulting precipitate was then extracted, dried, and characterized by scanning electron microscopy (SEM) with elemental analysis, x-ray diffraction (XRD), and in the case of the elemental Ni nanoparticles, vibrating sample magnetometry (VSM) measurements. The best fit lattice parameters obtained from the elemental Ni and Cu nanoparticles were 0.35289(28) and 0.36171(23) nm, respectively, in good agreement with the corresponding bulk values. On the other hand, the measured saturation magnetization of about 49 emu/g was somewhat smaller than the bulk Ni value. In the case of the Cu/Ni nanoparticles, the best fit lattice parameters for the Ni and Cu components of the core/shell structure were 0.35299(26) and 0.36101(10) nm, indicating the formation of an essentially pure Ni shell and a slight amount of Ni incorporation in the Cu core.

Karl Unruh
University of Delaware

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