

## Synthesis of Copper Nanoparticles Using Ionic Liquids

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We have successfully synthesized morpholinium ionic-liquid-stabilized copper(Cu) nanoparticles(NPs) by chemical reduction. The Cu NPs were characterized by using transmission electron microscopy and X-ray diffraction. UV, and NMR spectroscopies and transmission electron microscopy (TEM) were employed for characterization of the Cu NPs. The ILs effectively stabilized the Cu NPs, and the particle sizes were precisely controlled by the alkyl chain length of the cation in the ILs. The produced particles had a highly crystalline structure with a face-centered cubic (fcc) lattice. Broadening of the (111) plane in the X-ray diffraction (XRD) patterns was observed and the particle sizes calculated by Scherrer's equation were in good agreement with the TEM results. Additionally, UV, and NMR spectra indicated that nano-sized particles were produced and ILs were bound to the surface of the NPs, thereby protecting the particles from aggregation.