

FABRICATION OF SIZE-CONTROLLED COPPER NANOPARTICLES WITH DIFFERENT METHODS

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Abstract

The opportunity of using photocatalists in photocatalytical reactions is a very exciting and promising topic, thus it is one of the most popular and intensively growing research field in chemical sciences. Photocatalysis can give us alternative options for watersplitting and CO₂ reduction. Copper particles with proper size and shape could be a good candidate for further application.^{1,2}

In our work we introduce two different methods for syntetizing copper nanoparticles with different sizes. Our first method is a solvothermal synthesis in nitrate salt bath, the second is a solvochemical method in room temperature (~26°C), in latter case stabilizers are used. The precursors were water-soluble copper salts (C₁₀H₁₆CuO₄, CuSO₄) in each method, and the reductive components were oleylamine and NaBH₄. During the experiments, we studied the effect of the temperature, reaction time and concentrations of the components. According to our experience, size-controlling of copper nanoparticles is available with these synthesis methods. Our samples were investigated with Transmission Electron Microscopy and with Dynamic Light Scattering.

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