Synthesis and Characterization of Castor Oil and Ricinoleic Acid Capped Cds Nanoparticles Using Single Source Precursors

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Abstract

We report the synthesis of castor oil and ricinoleic acid capped CdS nanoparticles by the thermolysis of piperidine (1) and tetrahydroquinoline (2) dithiocarbamate complexes of cadmium(II) at temperatures varying from 190. °C to 300. °C. Reaction parameters such as time and temperature were varied to study their effect on the properties and morphology. The optical properties of CdS were typical of particles that displayed quantum confinement effects. X-ray diffraction studies revealed the existence of both cubic and hexagonal phases depending on the reaction conditions. Ricinoleic acid capped CdS gave cubic phase particles whereas castor oil capped CdS gave both cubic and hexagonal phases dependent on the reaction temperature and the type of complex used. The morphology of the particles varied from oval-short rods to spherical shaped particles with sizes ranging from 10 to 22. nm. Rhodamine B (RhB) dye photodegradation studies of a representative CdS nanoparticles' sample have been carried out in the presence of halogen light and studied using UV-visible spectroscopy.

Keywords

Castor oil;

Ricinoleic acid;

Optical properties;

Cadmium sulfide;

Photocatalysts