A study of cadmium sulfide nanoparticles with starch as a capping agent

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Abstrak

Capping agents such as starch can be used to protect semiconductor nanoparticles from aggregation and obtain uniform structures. Cadmium sulfide (CdS) nanoparticles with starch as a capping agent were prepared with an aqueous precipitation technique at different pH levels to study the optimum condition for producing a narrow distribution of nanoparticles. The morphology of the prepared nanoparticles was measured by scanning electron microscopy (SEM). Grain sizes of the samples determined by X-ray Diffraction (XRD) with Scherer's equation were relatively dependet on the pH applied in the synthesized process. Infrared spectroscopy (FT-IR) indicated that the starch and the nanoparticles were bonded by R-N=C=S bonds, but bondinbg depended on the pH used. The band gap of the CdS nanoparticles measured by UV-Vis spectroscopy was 2.39 eV, which was lower than CdS in bulk phase because of distorted structures in obtained CdS nanoparticles.