

Temperature Dependant Synthesis of CdS Nanocrystals using Pepsin

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Abstract:

There is growing interest in materials chemistry for taking advantage of the physical and chemical properties of biomolecules in the development of the next generation of nanoscale materials for opto-electronic applications. A biomimetic approach to materials synthesis offers the possibility of controlling size, shape, crystal structure, orientation, and organization. The great progress has been made in the control that can be exerted over optical materials synthesis using Biomolecules (protein, nucleic acid)/mineral interfaces as templates for directed synthesis. We have synthesized the CdS nanocrystals using biomimetic technique with the help of pepsin at different temperatures. The obtained CdS nanocrystals were characterized by x-ray diffraction (XRD) and small angle x-ray scattering (SAXS). The results obtained from XRD clearly indicate that the particle size decreases with decreasing temperature and goes towards excitonic Bohr radius at 4°C. SAXS results shows mono-dispersity in the synthesized materials.

Keywords: SAXS; XRD; Biomimetic techniques; Pepsin; Nanocrystals.

