CdS and CdSe/CdS Nanoparticles Stabilized by Poly(cysteine acrylamide) in Aqueous Solutions

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Cysteine acrylamide (N-acryloylcysteine) is a water-soluble polymerizable thiol ligand for the synthesis of highly stable nanoparticles. After synthesizing nanoparticles the acrylamide groups on the surface can be polymerized with heat to give a polydentate thiol ligand. CdS nanoparticles synthesized from Cd(ClO4) and Na2S at pH 10 in aqueous solutions of cysteine acrylamide are tunable to diameters in the range of 3-6 nm. Heating to 65- 70 oC and dialysis gives CdS particles that are colloidially stable for more than a year. Cysteine acrylamide can also displace citrate stabilizer from CdSe/CdS core/shell nanoparticles. Once cysteine acrylamide is on the CdSe/ CdS nanoparticles the new stabilizer can be polymerized and the solution dialyzed to remove excess ligand. The cysteine acrylamide does not adversely affect fluorescence or UV/Vis absorption properties of these nanoparticles. The poly(cysteine acrylamide)-stabilized nanoparticles are being coated onto polystyrene latex particles to form the cores of a new class of core/shell polymer spheres.