

Synthesis of CdTe Nanoparticles Using Thioglycolic Acid, Thioglycerol and L-cysteine

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We synthesized photostable thiol-capped CdTe nanocrystals(NCs) via chemical reaction using thioglycolic acid, thioglycerol and L-cysteine as stabilizers. In the NP synthesis, 0.985g (2.35mmol) of $\text{Cd}(\text{ClO}_4)_2 \cdot 6\text{H}_2\text{O}$ was dissolved in 125mL of water, and 5.7mmol of the thiol stabilizer was added under stirring, followed by adjusting the pH to 10.0 by dropwise addition of 1M solution of NaOH. The solution was placed in a three-necked flask and was deaerated by N_2 bubbling for 30min. Under stirring, H_2Te gas was passed through the solution together with a slow nitrogen flow for 20min. CdTe precursors were formed at this stage which was accompanied by a change of the solution color, depending on the thiols used, to yellow (1-thioglycerol) and orange (thioglycolic acid and L-cysteine). The ratio of stabilizer to Cd^{2+} was 1: 2.4. The average sizes of the synthesized NPs were 5.1nm, 5.5nm, 5.7nm for thioglycolic acid, thioglycerol and L-cysteine respectively. The produced particles were crystalline in structure with a face-centered cubic (fcc) lattice. This was supported by Korea National University of Transportation in 2019