Aqueous synthesis of AgInS/ZnS quantum dots covered with 3-mercaptopropionic acid

There are many applications of colloidal quantum dots (QDs), such as biochemical, electrochemical and medicine, due to high intensity of the fluorescence, availability, photo- and colloidal stability. In comparison to the binary QDs, such as CdS, ZnS, PbSe, InAs and etc., ternary QDs such as QDs I–III–VI (I = Cu, Ag; III = In, Al, Ga; VI = S, Te, Se) includes a less toxicity elements and are promising as candidates to develop eco-friendly QDs.

One of the most effective methods of synthesis is a heating-up method in aqueous solution which contain precursors of QDs. Using water as a solvent is cheaper and friendlier to the environment than using toxic organic solvents. Also, hydrophilic AgInS/ZnS QDs is perspective in biological application. In this synthesis QDs are usually covered with an organic ligand layer. These ligands play a key role in achieving colloidal stability during synthesis and controlling the optical and electronic properties of QDs.

In this work, we have received of water-soluble AgInS/ZnS QDs covered with 3-mercaptopropionic acid using low toxic precursors and analyzed their luminescent properties and the possibilities of analytical application.

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