Patent Search

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Abstract:

A METHOD FOR PREPARATION OF HIGHLY STABLE Ag-QDs The present invention describes a method of preparation of highly stable Ag-QDs. The present invention, the ligand plays a significant role in the effective stabilization of silver quantum dots (Ag-QDs). Such QDs have got attention in medicines, catalysis, as biosensor / sensor, and have optical and antibacterial properties etc. Three ligands having “N”, “S”, and “O” donor groups and different length of pendent alkyl chain [R = CH3 (L1), C10H21 (L2), C18H37 (L3)] have be synthesized and characterized. The donor atoms present on ligands have been found to stabilize the Ag-QDs (1-3 stabilized with L1-L3 respectively) in the colloidal state effectively, and the pendant alkyl chain on the ligand governs their uniform dispersion. It has been observed that the alkyl chain governs the SPR of Ag-QDs and directly proportional to the length of alkyl chain. The absorption maxima have been found red shifted on increasing the alkyl chain length. Accompanied Drawing [Figures. 1-7]

Complete Specification

DESC:FIELD OF INVENTION:
This invention generally relates to the field of a method for preparation of highly stable Ag-QDs, method and more particularly relates to a new multidentate (N,S,O) donor ligand containing a pendant alkyl chain for the effective stabilization of colloidal Ag-QDs. These QDs have been explored for the sensing of cation/anions.
BACKGROUND OF THE INVENTION
In recent years, the sensing of pollutants (such as metal ions/anions) from water sources with the help of metal nanoparticles has received considerable attention due to the visual changes with naked eyes. Mercury and copper have been recognized as toxic elements for environment including human beings. Mercury pollutants are released into the environment due to burning coal, oceanic and volcanic emissions, gold mining and chemical industries. Excess accommodation of copper in humans is responsible for diseases such as Wilson’s which occur due to the deposition of copper ions in contaminated foods and water sources. Also, anion recognition has gotten significant attention due to their importance in biology, chemistry, and environment. Iodide is one of the most important anions which influences neurological and thyroid functions. As a result, there is a lot of interest in developing systems that can preferentially recognize iodide over the other anions. Thus, there is an urgent need to develop new probes which are sensitive and can selectively identify metal ions and anions. For the removal/sensing of heavy metals, metal nanoparticles/quantum-dots (NPs/QDs), in particular AgNPs, have been explored as suitable material due to their higher surface plasmon resonance. The stability of such NPs/QDs is an important parameter for their activity. The metal NPs/QDs tend to aggregate (Ostwald ripening) over the time and in turn losing their activity. Therefore, the surface modification of NPs/QDs is an important strategy to improve the stability and sensing activity. Such modification can be performed by using a suitable ligand. The ligand used during the synthesis of NPs/QDs governs the size, shape, composition, dispersion, solubility, and catalytic activity. The stabilizing ligand must be strong enough to stabilize the NPs/QDs but should

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