

Optical properties of ZnSe nanocrystals by controlling sizes using Oleic acid

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Semiconductor nanocrystals, also referred to as quantum dots, are of great interest for both fundamental research and technical applications due to their size dependent properties and excellent chemical processes. When materials are changing into nano-size, the new characteristic appear which couldn't be seen in bulk state. Thus control of nanocrystals size is a challenging topic and important in various applications, such as solar cell, light-emitting devices and biological sensor. Among II-VI compound semiconductor nanocrystals, ZnSe is of special interest as it exhibits, via quantum confinement effect, tunable blue- ultraviolet luminescence. Oleic acid, a natural surfactant, was chosen as the ligand for stabilizing the nanocrystals and cationic precursors in this study. This work focused on the synthesis of II-VI semiconductor nanocrystals with chemical surfactant effects. Optical properties and growth of ZnSe quantum dot were monitored and estimated quantitatively by using UV/Vis spectrometer and photoluminescence (PL) spectroscopy. It is interesting that the estimated values are correspondent to the experimental observations directly.