

Size and shape control of CdSe nanocrystals prepared by the direct one-pot synthesis

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An efficient method, which is stable under ambient conditions, for formation of semiconductor quantum dots/rods is under investigation. It is a one-pot method using a single, convenient organic precursor, which acts as a stabilizing agent, and is carried out under relatively low temperature. In this study, the cadmium selenide (CdSe) nanocrystals were synthesized by the reaction of cadmium chloride (CdCl₂) and elemental selenium (Se) in oleylamine. The CdSe nanocrystals obtained without size-selection process were nearly monodisperse and highly crystalline. The most influential factors on the crystallization of CdSe were the reaction temperature, time, and molar concentration of precursors. CdSe nanocrystals with various sizes and shapes (0-dimensional dots and 1-dimensional rods) are currently being prepared. In this presentation, the relationship between the size of nanocrystals and their optical properties by using various analytical tools such as transmission electron spectroscopy (TEM), X-ray diffraction (XRD), UV-vis spectroscopy, and photoluminescence (PL) spectroscopy will be discussed.