

A study on the fluorescence quenching mechanism of CdSe/CdS core/shell quantum dots with different shell thickness

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Quantum dots (QDs) have been widely studied in many fields because of its unique optical properties such as size-tunable emission wavelength and resistance to photobleaching compared to organic dyes. Especially, in applications of energy transfer phenomenon, QDs have been widely used as donors. So, even though there are many studies about fluorescence quenching of QDs caused by energy transfer phenomenon, few studies are available on the aggregation of QDs. We have investigated the fluorescence quenching mechanism of QDs caused by aggregation of QDs. To elucidate mechanism of fluorescence quenching, we synthesized core/shell QDs with different shell thickness and induced the aggregation of QDs. QD aggregation was monitored by PL spectroscopy, transmission electron microscopy, quasi-elastic light scattering, and UV-vis spectroscopy.