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Synthesis and Characterization of Cadmium Selenide Quantum Dots

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CdSe quantum dots (QDs) with different particle sizes were successfully synthesized using the hot-injection method. The CdSe QDs were synthesized by reacting cadmium acetate dihydrate $[\text{Cd}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}]$ and selenium (Se) powder in the presence of 2-mercaptoethanol as the capping agent. CdSe QDs of different crystallite sizes were prepared at different reaction temperatures of 150°C to 175°C, 200°C, 225°C, 250°C, 275°C and 300°C. The morphological, structural and optical properties of the as synthesized CdSe QDs were evaluated using SEM, XRD, HRTEM, and UV-Vis spectroscopy. From the UV-Vis, it was found that the crystallite size of CdSe QDs increases with the increase in reaction temperatures. The Kippeny method was used to calculate the crystallite size of CdSe QDs and it was found to be in the range of 0.82 – 2.46 nm. Furthermore, the data analysis has revealed that CdSe QDs crystallite size is dependent upon the reaction temperature.

Apply to be considered for a student award (Yes / No)?

yes

Level for award (Hons, MSc, PhD, N/A)?

MSc

Main supervisor (name and email) and his / her institution

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

Yes

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