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Title: Exciton Dynamics within Quantum Dots

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Abstract: We have tried to understand the role of excited state dynamics, particularly the transfer of excitation energy. The system which we worked with were cadmium selenide quantum dots, as they absorb in the visible region of the electromagnetic spectrum and have bandgap tunability based on their size. The primary techniques which were used to characterize the quantum dots were UV-Vis spectroscopy, fluorescence spectroscopy and time correlated single photon counting. Excitation of quantum dots, can be described in terms of electron-hole pairs; excitons. As the time scales of excited state transfer of 2-4 nm CdSe quantum dots is on the order of a few pico seconds to a few tens of pico seconds, we had to use time resolved spectroscopy to understand these dynamics. We used visible pump-probe/transient-absorption spectroscopy to give us the rates, and consequently, time scales of the excited state charge transfer process.

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