

## Size dependent optical properties of zinc blende CdTe nanocrystals

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Colloidal semiconductor nanocrystals are relatively a new class of fluorescent dyes with a tunable electronic band gap depending on their size due to the quantum confinement effect<sup>1</sup>. The optical and electronic properties of these materials make them interesting for applications like LEDs, solar cells and bio-labeling.

We have quantitatively examined the size dependent optical properties of zinc blende CdTe nanocrystals at the bandgap and at high energies. The optical properties are pertinent to the precision of the molar extinction coefficients. These coefficients are interesting physical quantities to determine the concentration. The local field factor has been explicitly taken into account to obtain these coefficients. The interplay of the experimental data obtained by inductively coupled plasma spectroscopy (ICPMS), UV-Vis absorption spectroscopy, transmission electron microscopy (TEM) and Rutherford back scattering (RBS) enables us to determine the extinction coefficients. The intrinsic absorption coefficients deduced at the bandgap increases as power of 3.05 to diameter. Maxwell-Garnette effective medium theory<sup>2-6</sup> enables us to calculate the oscillator strength and the exciton life times of the nanocrystals. The exciton life time is deduced to be between 8-14 ns.

### References:

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