

Near-infrared emitting CdTeSe alloyed quantum dots: Raman scattering, photoluminescence and single-emitter optical properties

Supporting information

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Supplementary characterizations

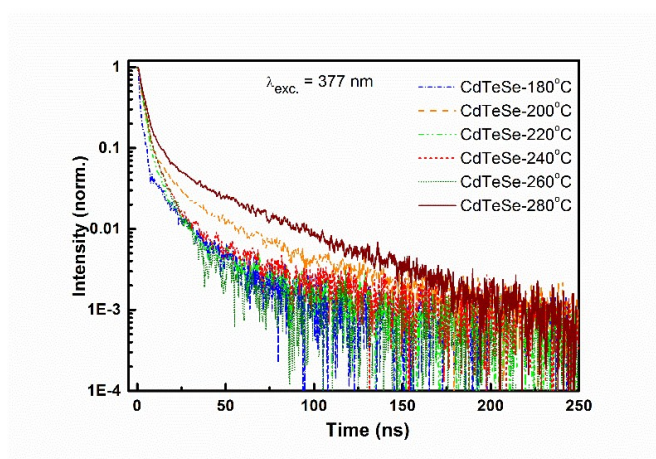


Figure SI-1 : PL decays curves of the first samples series.

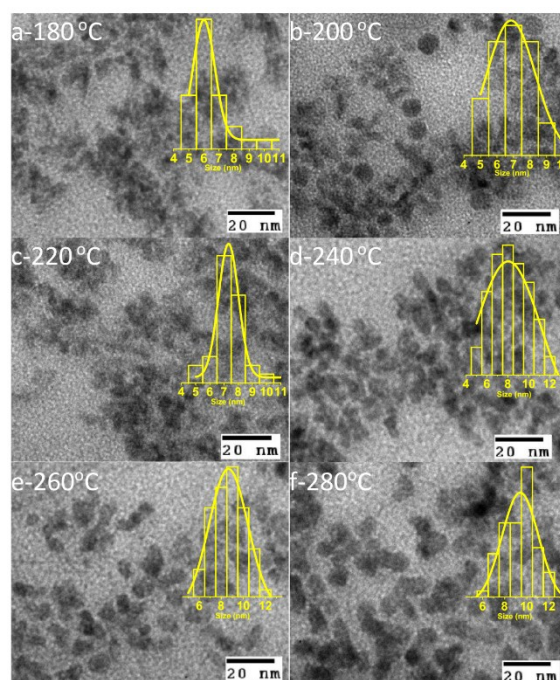


Figure SI-2 : TEM images of the first series of samples, with growth temperatures from 180°C to 280°C ; insets : histogram of the measured QD diameters.

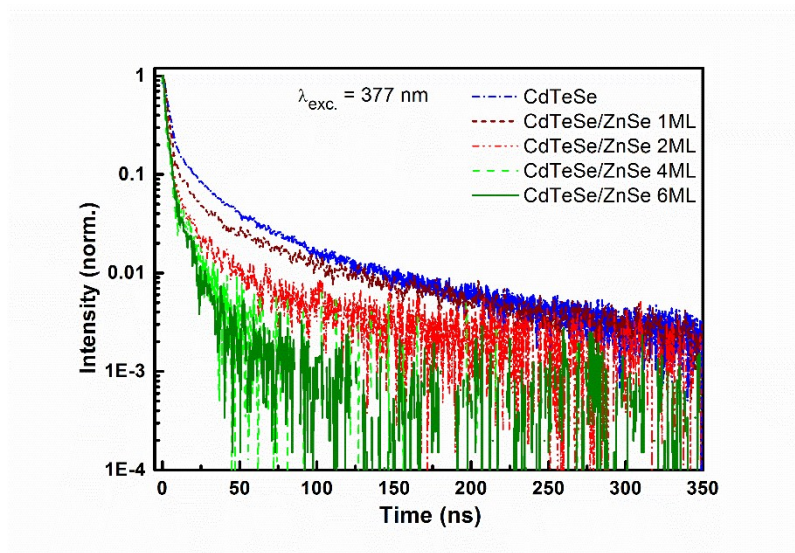


Figure SI-3 : PL decay curves of the samples CdTeSe and CdTeSe covered with ZnSe shell with different thickness.

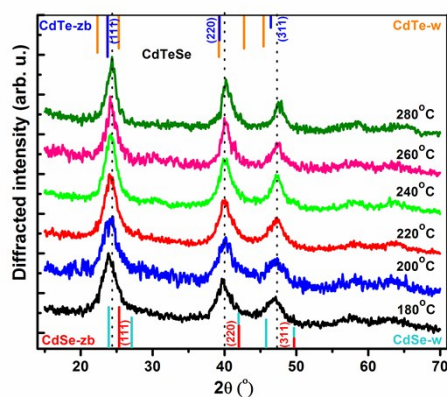


Figure SI – 4 : Powder XRD patterns of the first series : CdTeSe ternary QDs prepared at different temperatures from 180°C to 280°C. The tabulated values of the bulk diffraction peaks for zinc blend (zb) and wurtzite (w) CdTe, and CdSe are shown.

Role of oleyamine (OLA) :

We synthesized another set of samples, following the same protocol as in the first series, but without introducing OLA into the solution of precursors. The PL spectra (fig. SI-5) are blueshifted with respect to the ones of fig. 1, possibly due to a larger QD size, but show the same redshift with increased growth temperature. These samples show much improved PL intensity without OLA as compared to fig. 1, especially at higher temperatures. The Raman spectra, on the other hand (fig. SI-6), are very similar to the spectra of fig. 3 and indicate that similar Se/Te concentrations are obtained without OLA, with the same dependence on growth temperature.

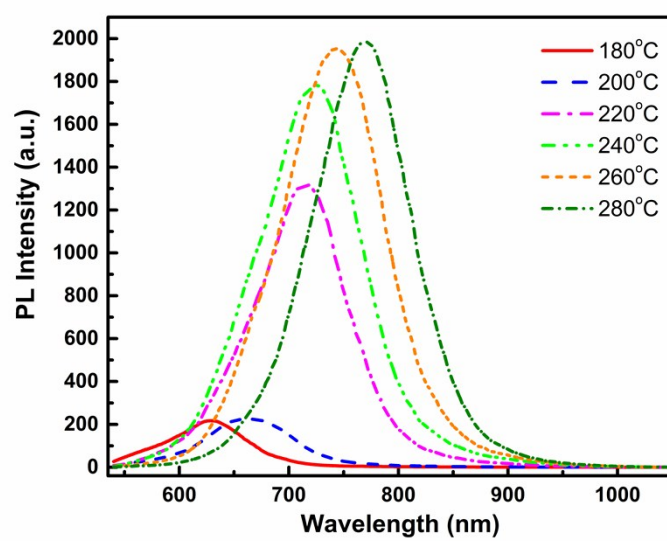


Figure SI-5 : PL spectra of the samples synthesized as in the first series without OLA

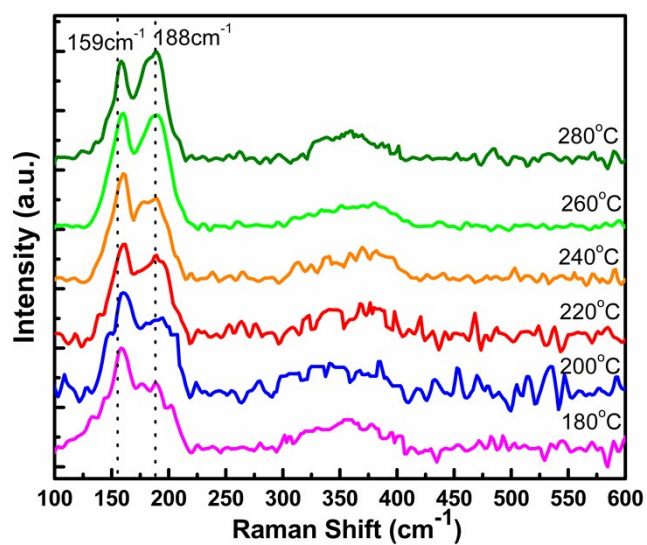


Figure SI-6 : Raman spectra of the samples synthesized as in the first series without OLA