Electronic Supplementary Information

Large-Scale Synthesis of Nanocrystals in a Multichannel Droplet Reactor

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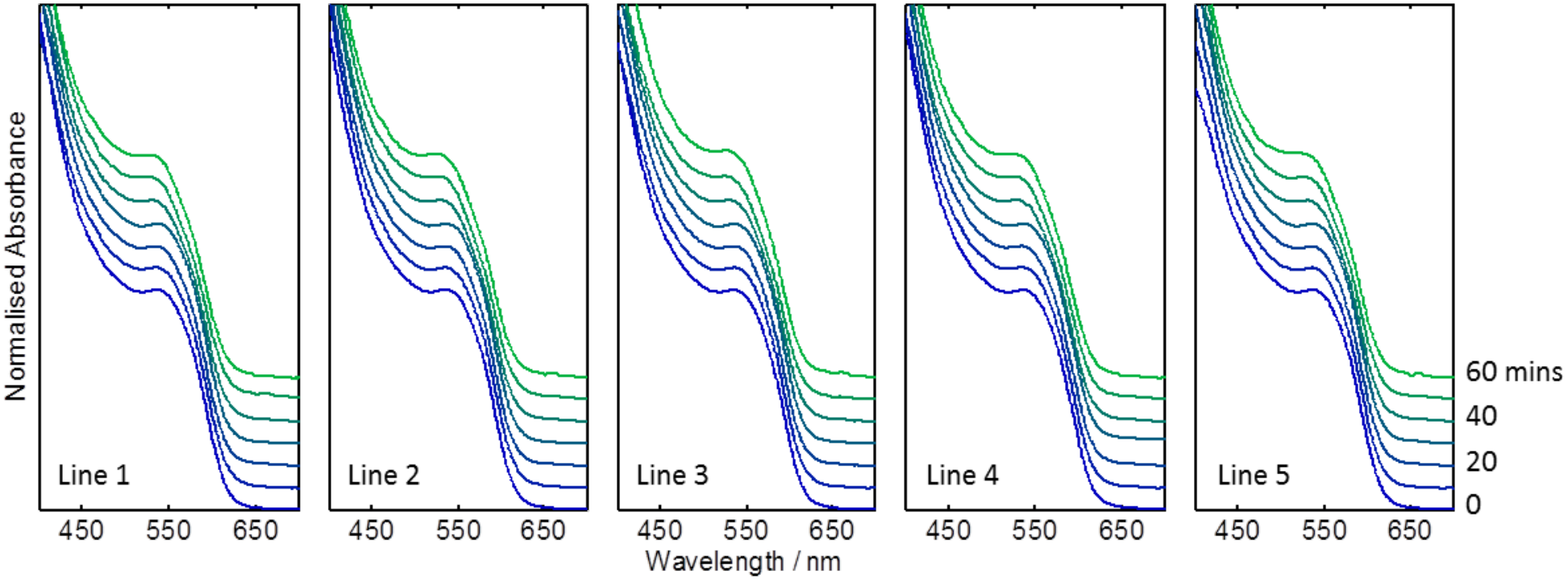

Figure S1: Normalised solution-phase absorption spectra of CdTe collected from each of the five reaction lines at ten minute intervals over a period of one hour.

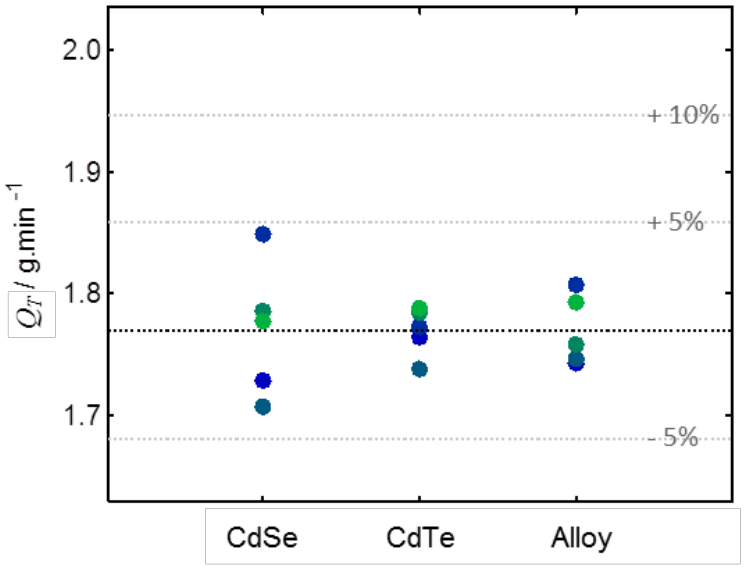

Figure S2: Average total flow rate Q_T in each of the five reactor lines for one hour production runs of CdSe, CdTe and the alloyed CdSeTe.

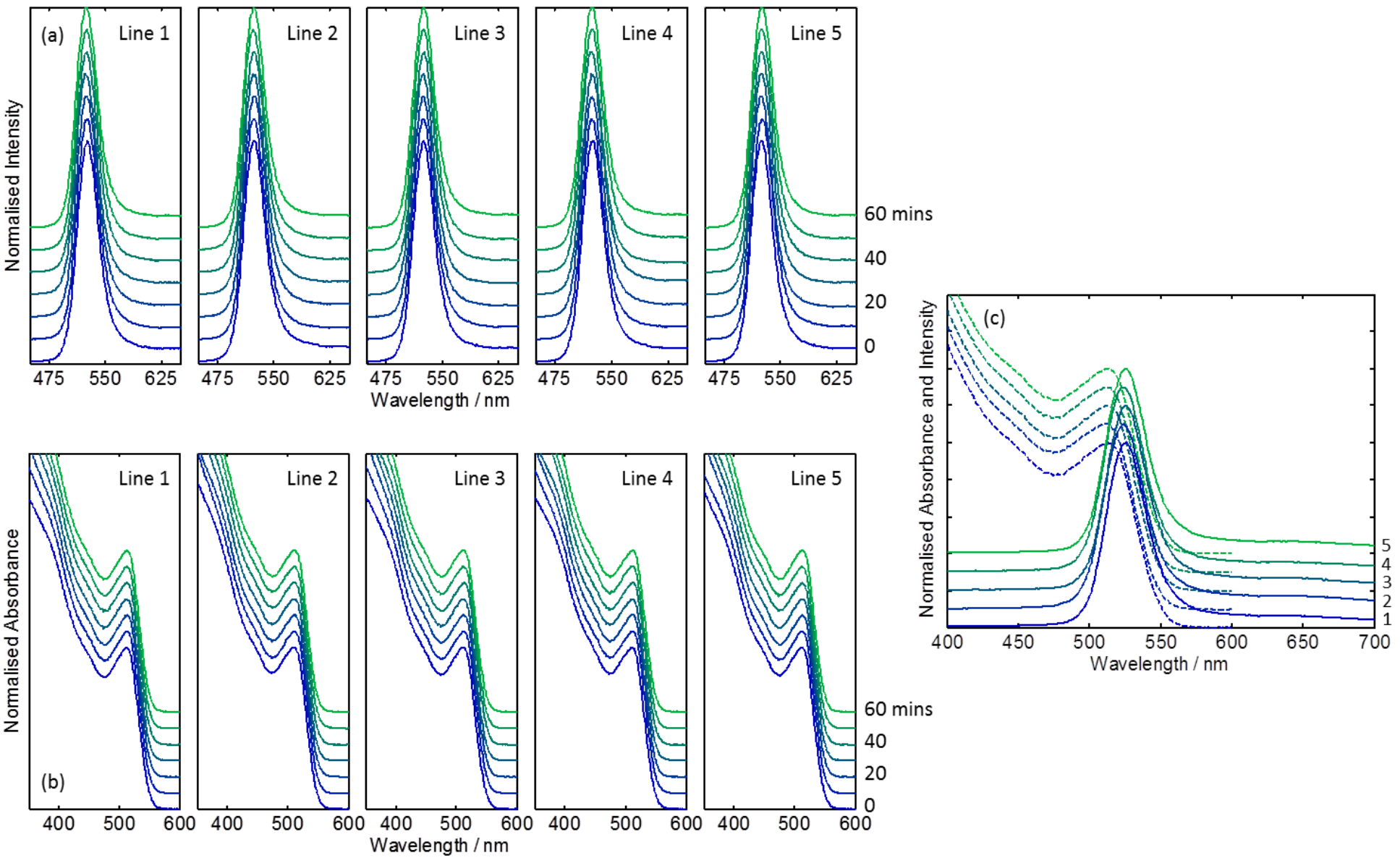

Figure S3: Normalised solution-phase emission spectra (a) and absorption spectra (b) of CdSe collected from each of the five reaction lines at ten minute intervals over a period of one hour. (c) Normalised solution-phase absorption spectra (dashed lines) and emission spectra (solid lines) of CdSe collected from each of the five reaction lines at t = 40 min.

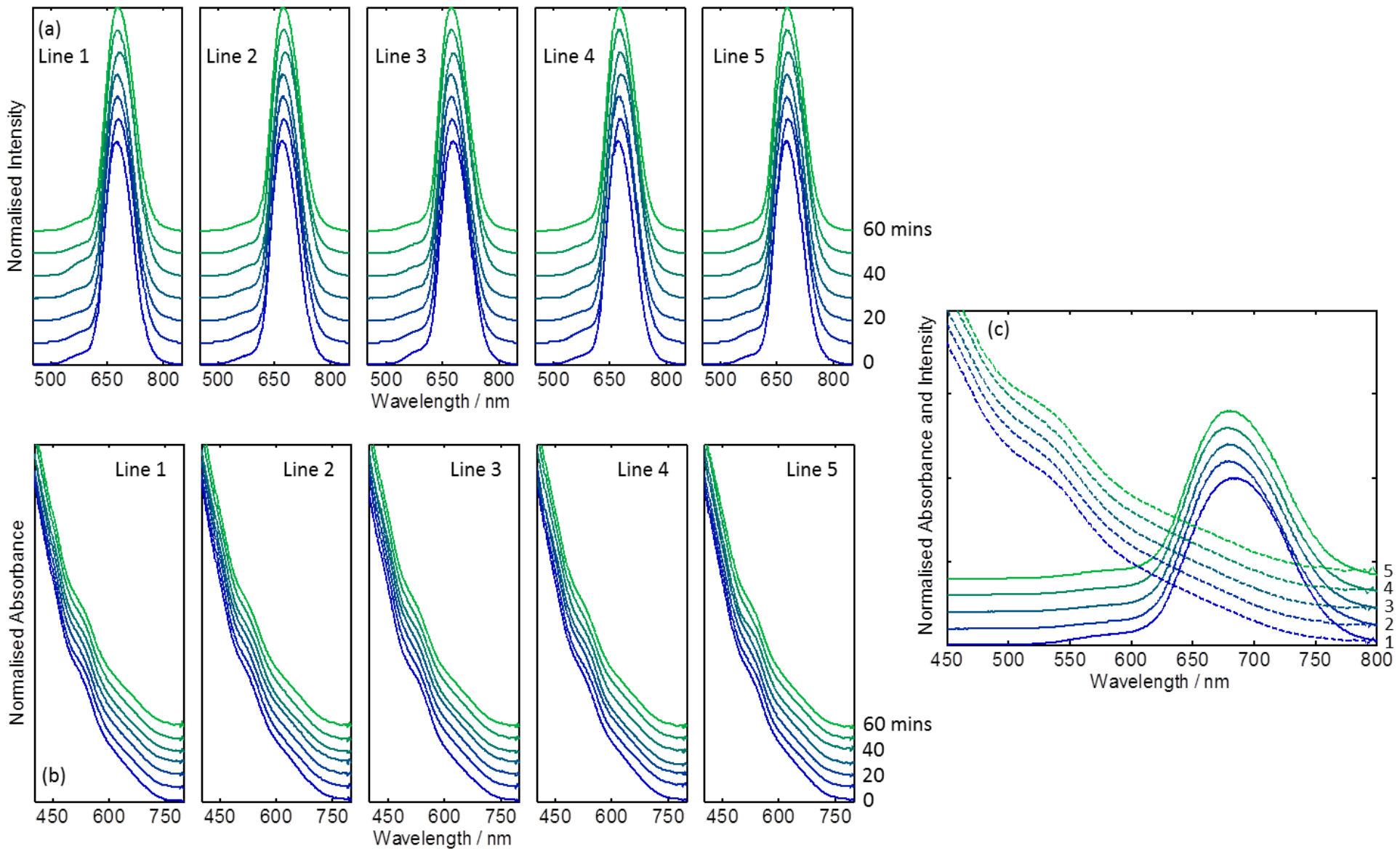

Figure S4: Normalised solution-phase emission spectra (a) and absorption spectra (b) of alloyed CdSeTe collected from each of the five reaction lines at ten minute intervals over a period of one hour. (c) Normalised solution-phase absorption spectra (dashed lines) and emission spectra (solid lines) of the alloy collected from each of the five reaction lines at t = 40 min.

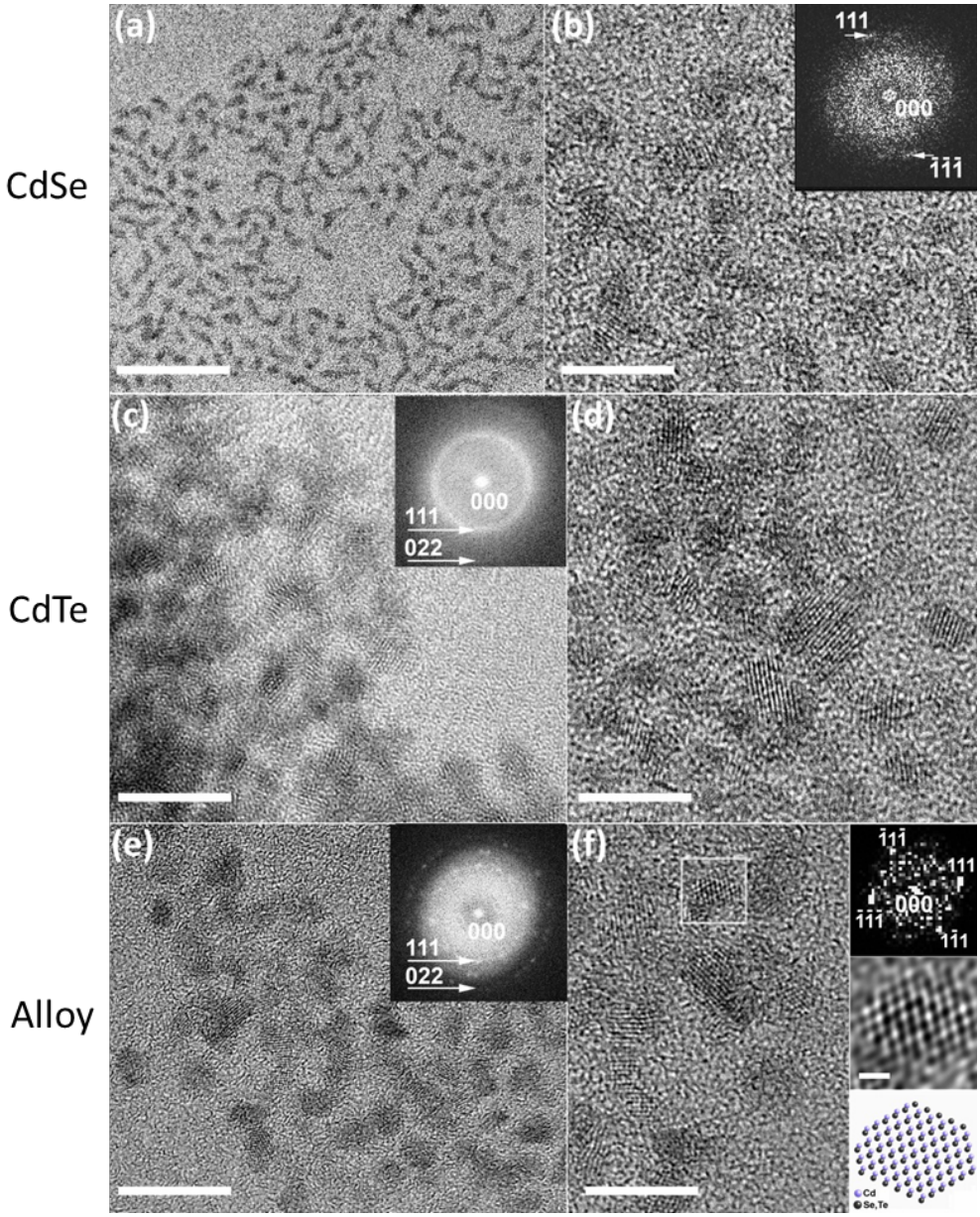

Figure S5: High resolution TEM images of the reactor-synthesised materials with clearly resolvable lattice fringes indexed by fast Fourier transforms (FFT) of the images. (a), (b) CdSe nanocrystals; the scale bars indicate 30 and 10 nm distances respectively. Inset in (b) is an FFT of the image in which the [1 1 1] d-spacing is evident. (c), (d) CdTe nanocrystals; the scale bars indicate 10 and 5 nm distances respectively. Inset in (c) is an FFT of the image in which both the [1 1 1] and [0 2 2] d-spacings are evident. (e), (f) alloyed CdSeTe nanocrystals; the scale bars indicate 10 and 5 nm distances respectively. Inset in (e) is an FFT of the image in which both the [1 1 1] and [0 2 2] d-spacings are evident. In (f) one crystal (highlighted by a white box) can be seen oriented with [1 0 1] parallel to the electron beam. An indexed FFT, filtered HRTEM image (scale bar = 1 nm) and structure model are shown inset.

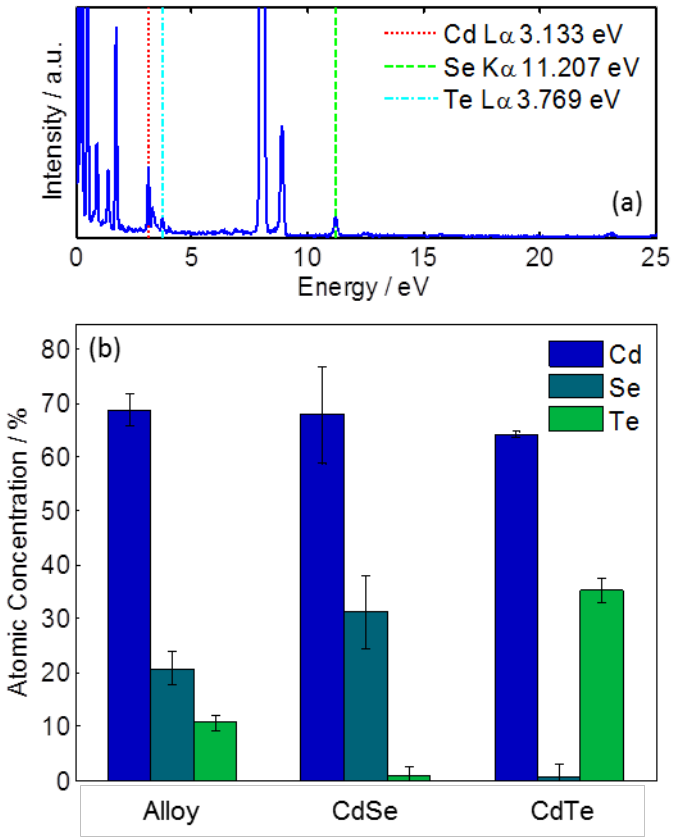

Figure S6: (a) EDX spectrum for the alloyed CdSeTe nanocrystals produced during a one hour production run, with the strongest Cd, Se and Te responses highlighted. (b) Bar chart showing Cd, Se and Te atomic concentrations in reactor-synthesised CdTe, CdSe and the alloy. As expected, the tellurium content is approximately zero for CdSe and the selenium content is approximately zero for CdTe, while in the alloy selenium and tellurium are both present at an approximate ratio of two to one. The cadmium to chalcogenide ratio is approximately two to one for all three materials – a likely consequence of the cadmium-rich reaction conditions leading to cadmium-terminated surfaces (see Z. Li and X. Peng, *Journal of the American Chemical Society,* 2011, ***133***, 6578-6586).

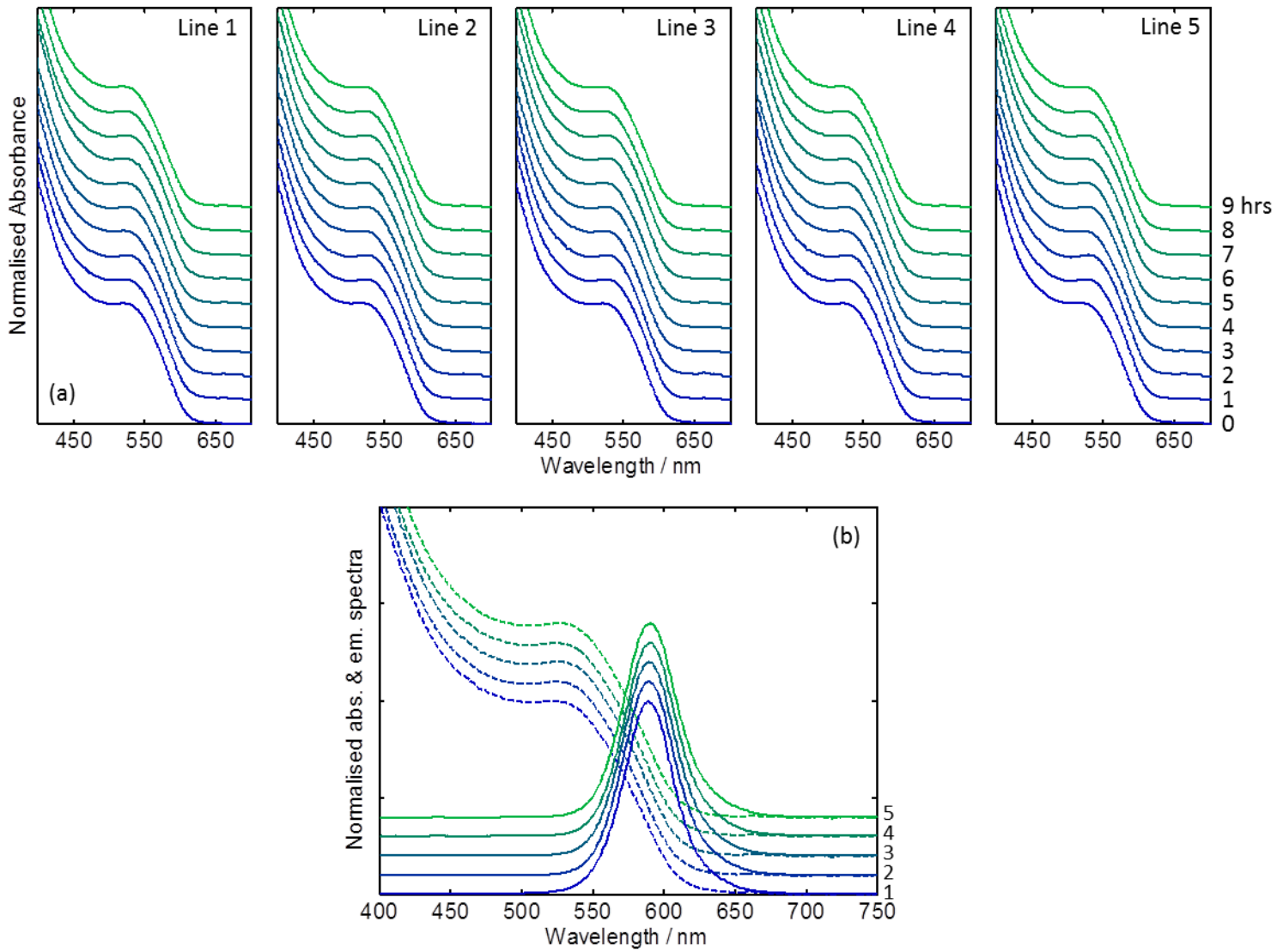

Figure S7: (a) Normalised solution-phase absorption spectra of CdTe collected from each of the five reaction lines at one hour intervals over a period of nine hours. (b) Normalised solution-phase absorption spectra (dashed lines) and emission spectra (solid lines) of CdTe collected from each of the five reaction lines at t = 1 hour.

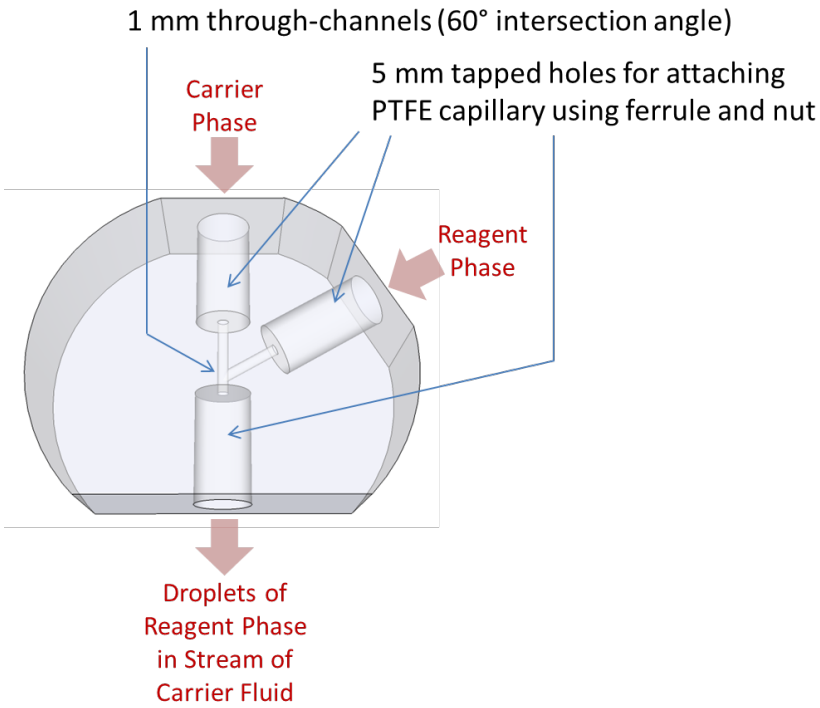

Figure S8: Schematic of a T-junction droplet generator, machined from PTFE round-stock.