Supporting information

Size-dependent extinction coefficients and transition energies of near-infrared β-Ag_2Se colloidal quantum dots

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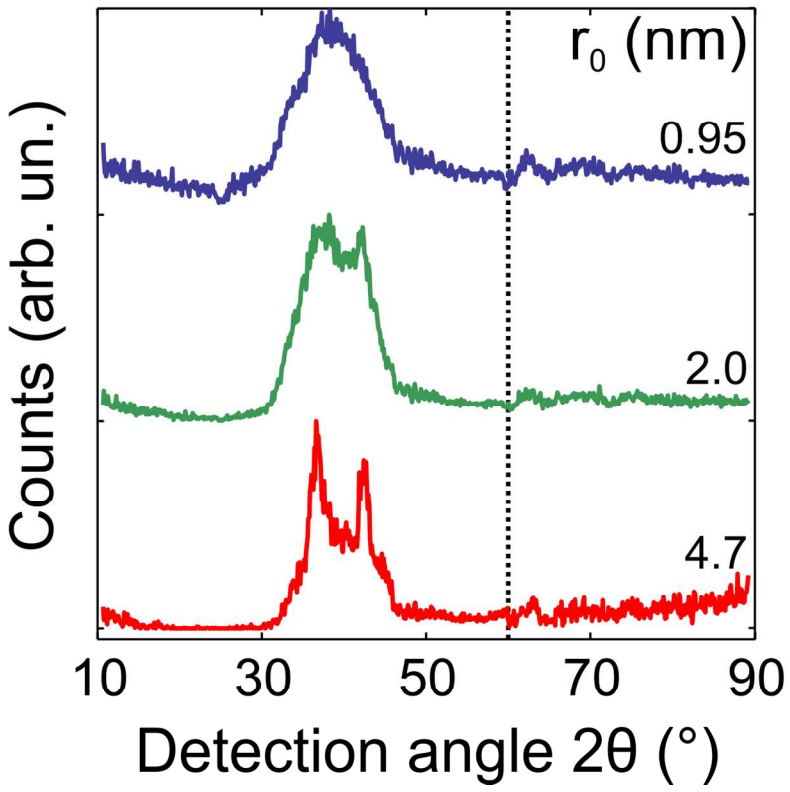


Figure S1 – XRD patterns for r_0 = 0.95 nm, 2.0 nm and 4.7 nm β-Ag_2Se cQDs. The dotted line shows the separation between two acquisitions of the diffractogram. Peaks characteristic of Ag^0 at 2θ = 64.5° and 77.5° are not observed, indicating the absence of this metal.[1]

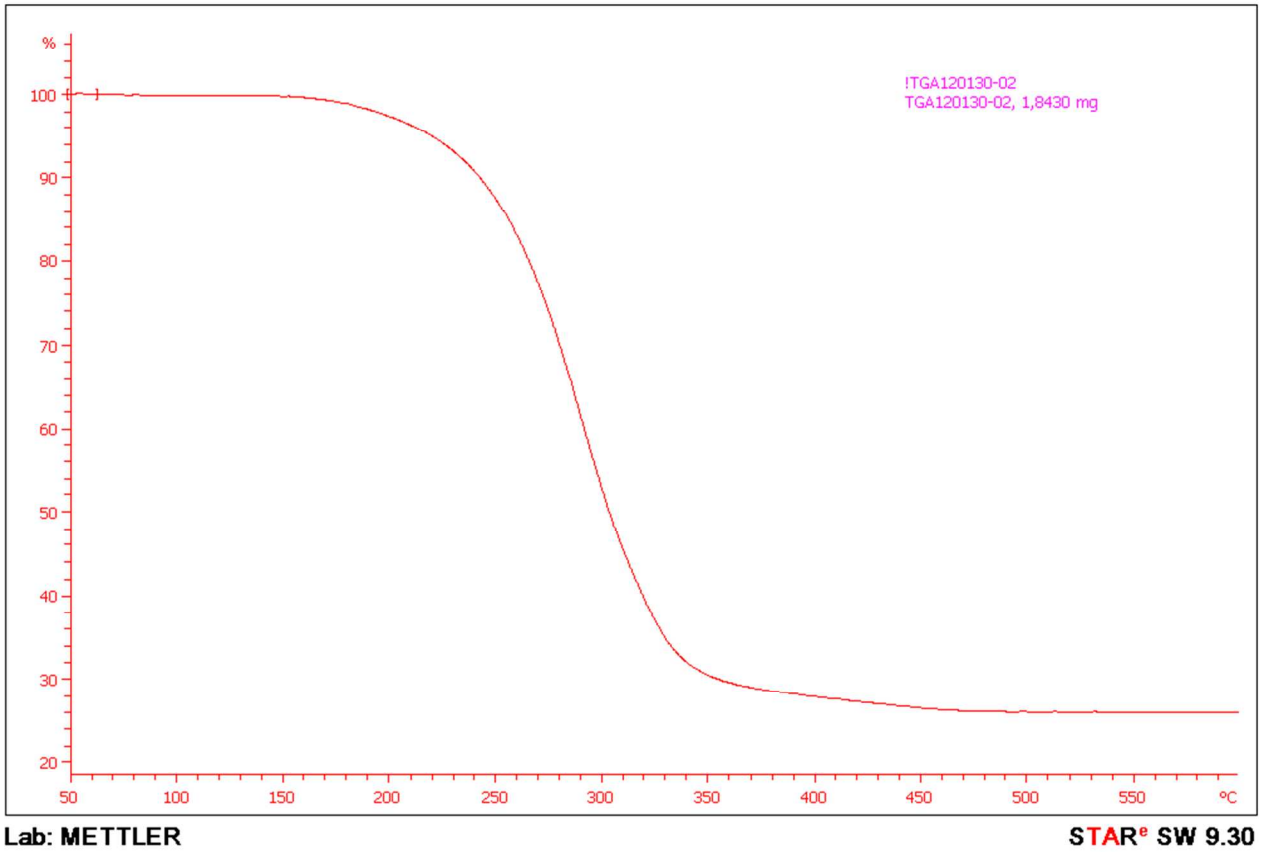
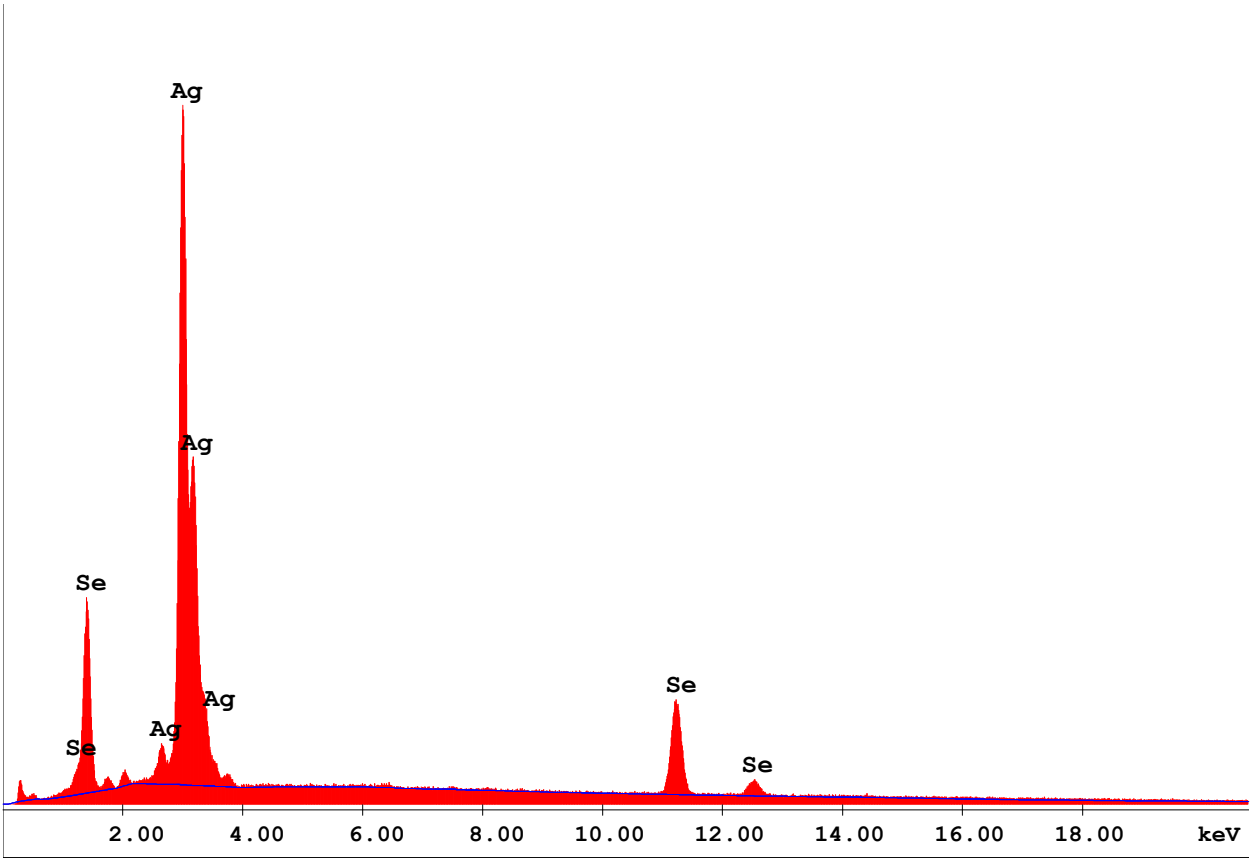


Figure S2 – TGA curve obtained for $r_0 = 2.0$ nm β-Ag_2Se cQDs from 50°C to 600°C with a heating rate of 20°C/minute.



Element	Wt %	At %	K-Ratio	Z	A	F
AgL	72.37	65.72	0.6138	0.9985	0.8494	1.0000
SeK	27.63	34.28	0.2693	1.0057	0.9692	1.0000
Total	100.00	100.00				

Element	Net Inte.	Bkgd Inte.	Inte. Error	P/B
AgL	4688.14	166.75	0.27	28.11
SeK	961.83	123.37	0.66	7.80

Figure S3 – EDS spectrum obtained for $r_0 = 2.0$ nm β-Ag_2Se cQDs.

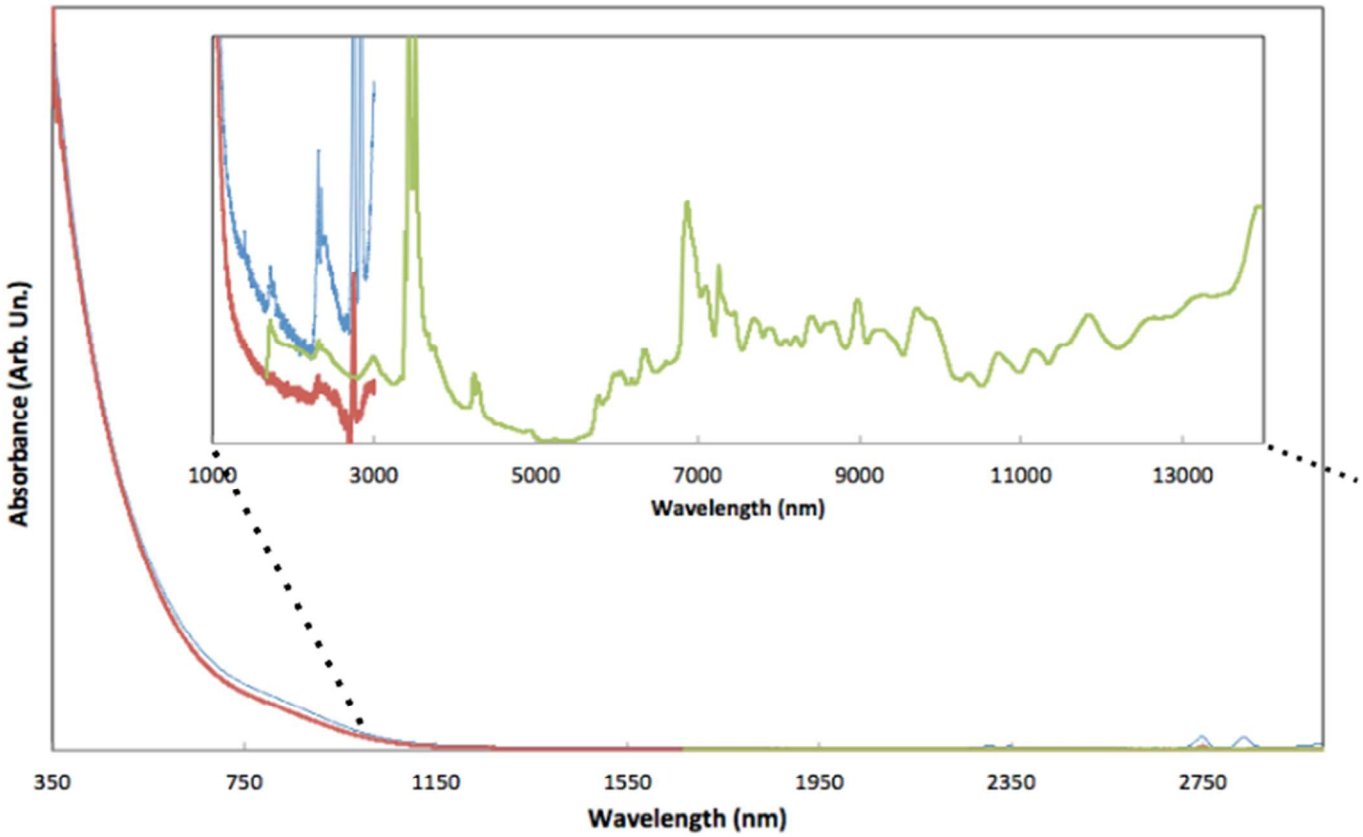


Figure S4 – UV/Vis/NIR absorption spectra obtained of r_0 = 1,3 nm β-Ag_2Se cQDs in TCE with (blue line) and without (red line) oleic acid (7% V/V) added after purification. The Fourier Transform IR spectra was obtained by attenuated total reflectance for dried cQDs without oleic acid (green line). In inset, the IR spectrum shows important absorption from the organic ligands beyond 2 μm possibly preventing the observation of lower absorption from the cQDs in this region.

References:

(1) Swarthmore, P. *Powder diffraction file alphabetical index. Inorganic phases*; JCPDS-International Centre for Diffraction Data, 1980.