

Supplementary Information – Hydrothermal Microwave Synthesis of Water Soluble NIR-II Emitting Ag₂S Quantum Dots

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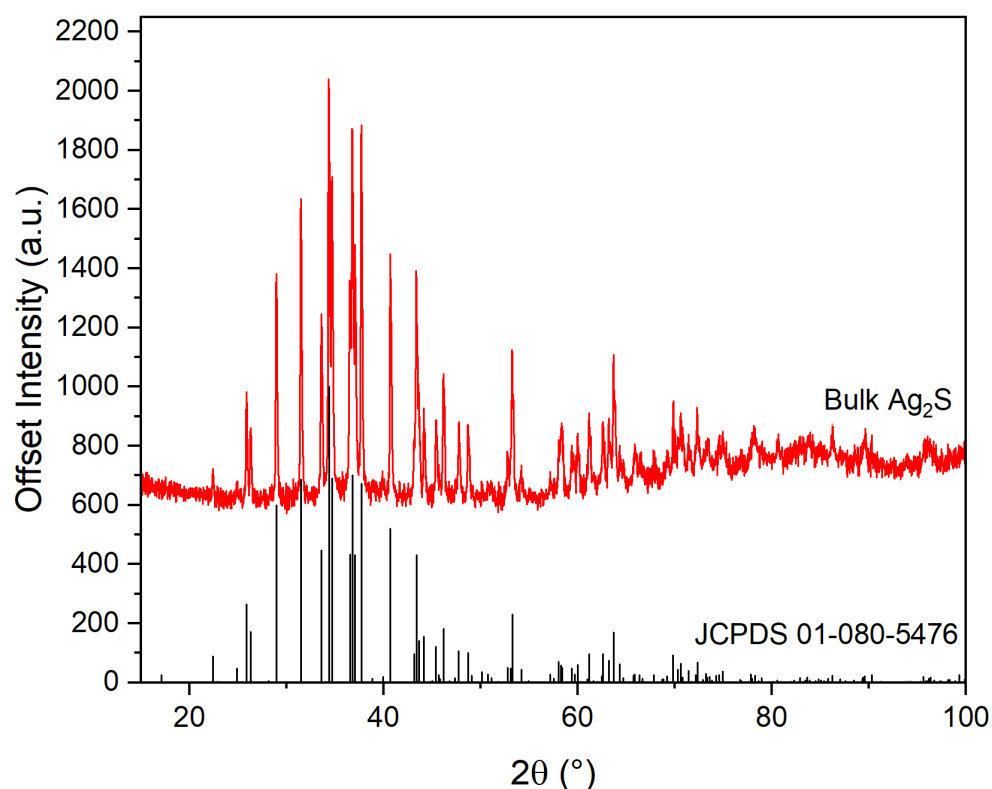


Figure S 1: X-ray diffraction of bulk Ag₂S used as a reference compound for the linear combination fitting of the X-ray near edge spectroscopy data. The reference pattern of bulk monoclinic Ag₂S is given for comparison (JCPDS 01-080-5476)

*Table S 1: Tabulated values from PLQY analysis via the comparative method using the NIR dye IR125 (PLQY = 13% for $\lambda_{exc} = 450$ nm in ethanol) for the samples Ag₂S-12-15, Ag₂S-12-20, Ag₂S-14-1, Ag₂S-14-5 and Ag₂S-14-10 calculated via the formula of Demas and Crosby (See Experimental Section).
Refractive indices: 1.36 (ethanol), 1.33 (water)*

	Integral	Quantum Yield (%)
IR125	5.59E+07	
Ag ₂ S-12-15	8.53E+05	0.34
IR125	4.75E+07	
Ag ₂ S-12-20	3.50E+04	0.02
IR125	5.14E+07	
Ag ₂ S-14-1	1.46E+06	0.62
IR125	4.67E+07	
Ag ₂ S-14-5	3.94E+05	0.19
IR125	4.75E+07	
Ag ₂ S-14-10	5.73E+04	0.03

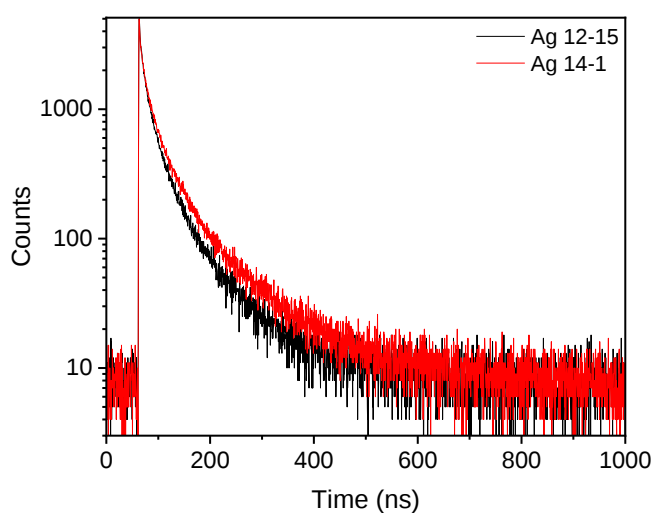


Figure S 2: TRPL decay curves of Ag₂S-12-15 (black) and Ag₂S-14-1 (red) performed at a wavelength of 940 ± 10 nm after excitation with a picosecond pulsed laser (5 mW) at 405 ± 10 nm

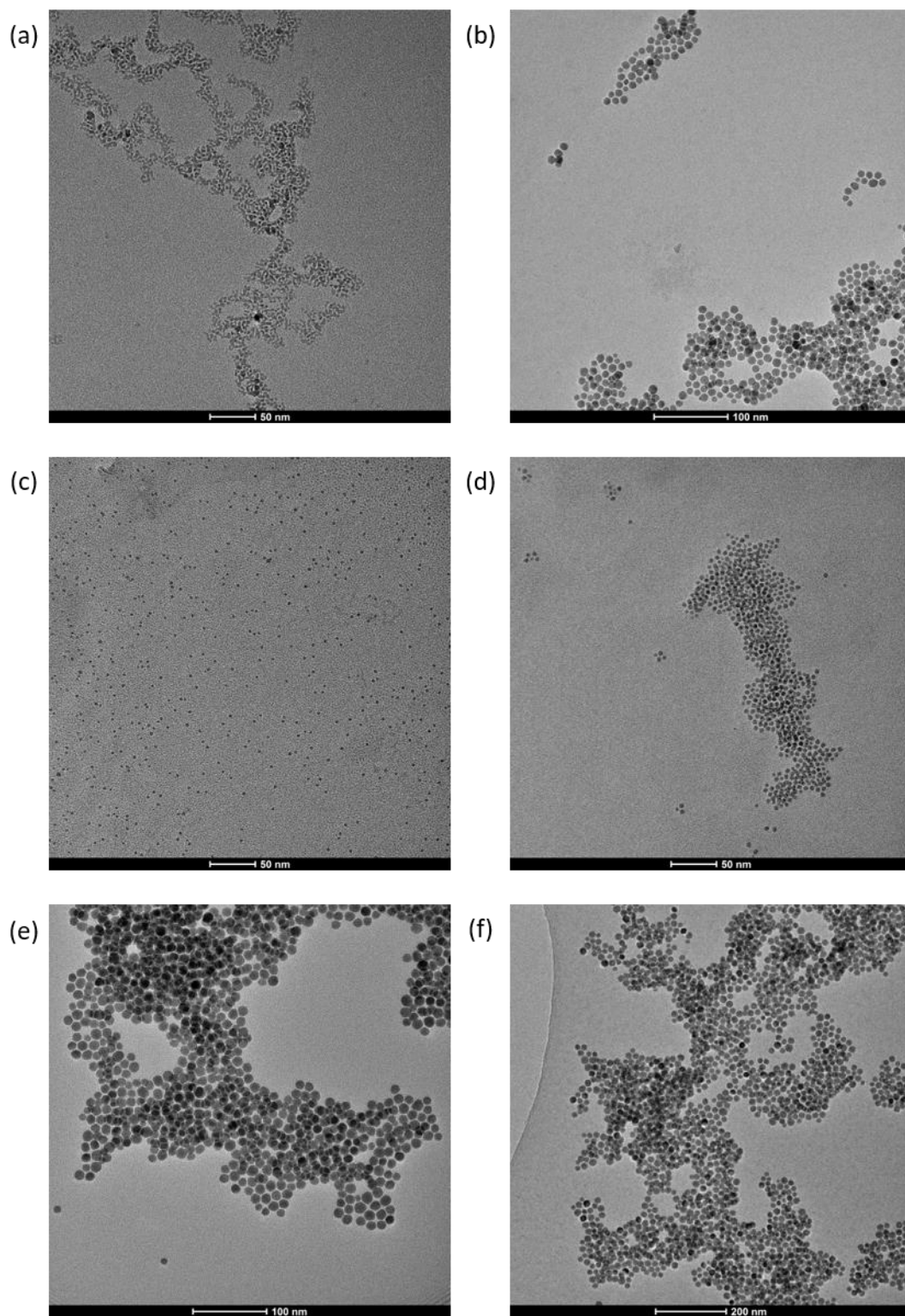


Figure S 3: Transmission electron microscopy (TEM) images of Ag_2S -12-15 (a), Ag_2S -12-20 (b), Ag_2S -14-1 (c) Ag_2S -14-5 (d), Ag_2S -14-10 (e) and Ag_2S 14-15 (f)

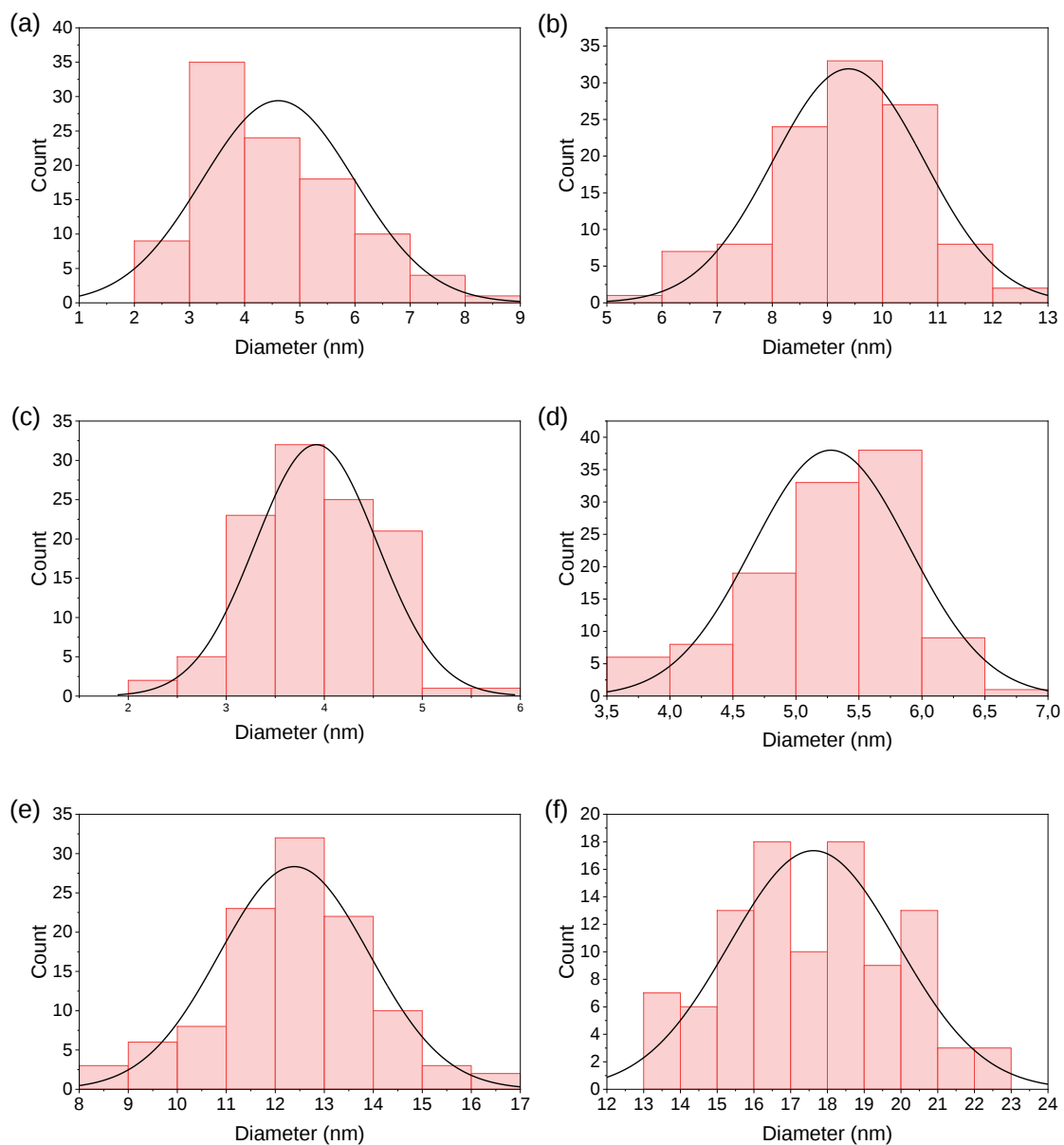


Figure S 4: Histograms of particle size overlayed with the distribution curve (black) yielded from manual particle counting image analysis ($n > 100$) for Ag_2S -12-15 (a), Ag_2S -12-20 (b), Ag_2S -14-1 (c) Ag_2S -14-5 (d), Ag_2S -14-10 (e) and Ag_2S 14-15 (f)

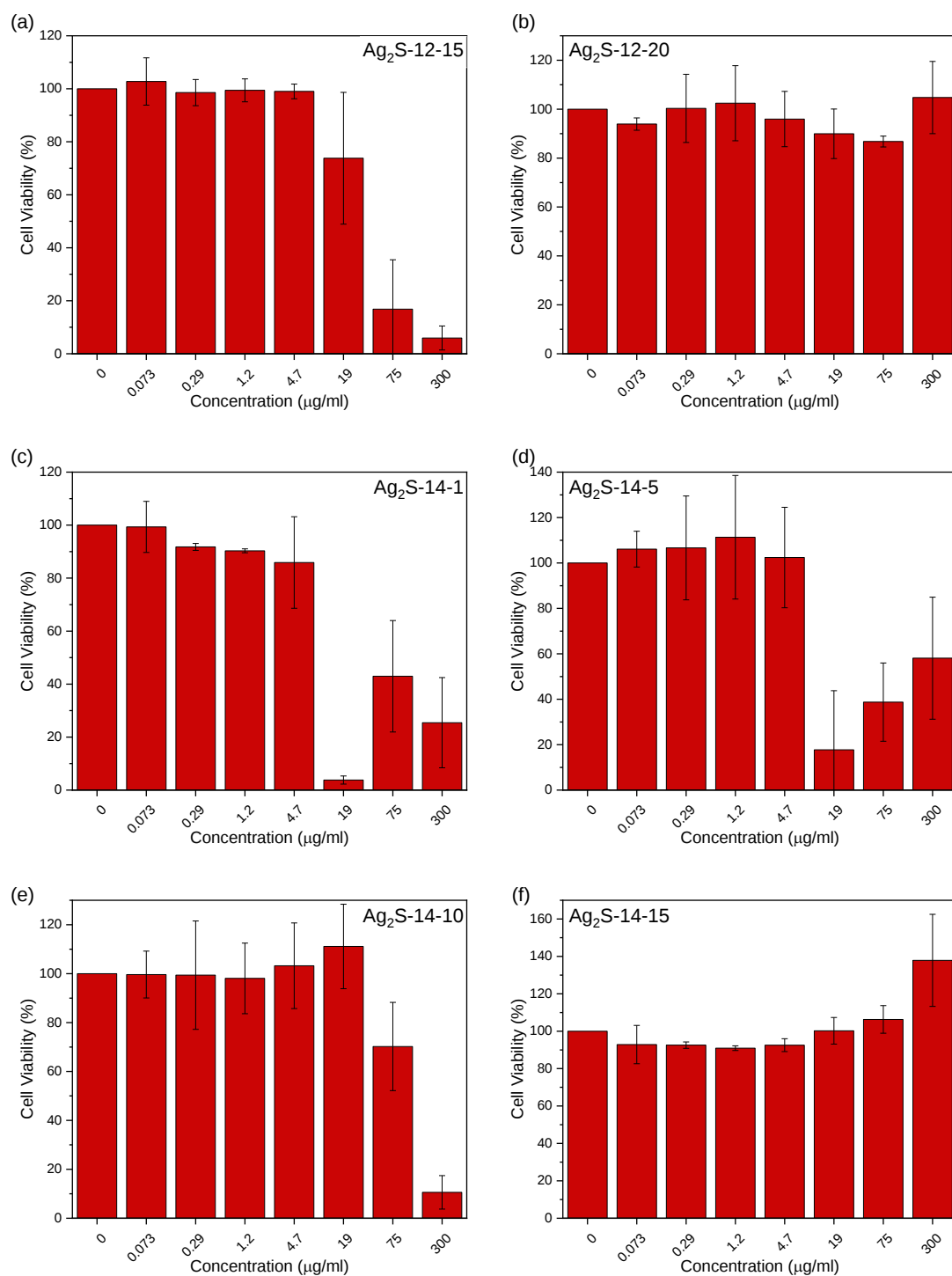


Figure S 5: Cell viability as a function of mass concentration of selected Ag_2S QD formulations ((a) Ag_2S -12-15; (b) Ag_2S -12-20; (c) Ag_2S -14-1; (d) Ag_2S -14-5; (e) Ag_2S -14-10; Ag_2S -14-15). MTT cell viability assays were conducted after incubating the selected Ag_2S QDs, in the concentration range of 0 – 300 μg/ml for 24 hours, with the HepG2/C3A cell line (a human liver cell line). The results in each bar graph are the average value from experiments performed in triplicate (mean ± SD). The increase

in viability at higher concentrations, seen in some spectra, is due to the absorbance of the measured wavelength by QDs remaining after washing or those internalised by the cells.