Electronic Supplementary Information

A novel soft hydrothermal (SHY) route to crystalline PbS and CdS nanoparticles exhibiting diverse morphologies

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TEM	[Prec]	[TG]	TG/Prec	Additional [OH]	pH	Morphology of crystallites
a	2.48×10^{-2}	1.84	74.2	2.38	~14	Truncated cubes. 10 min reaction
b-c	1.24×10^{-2}	1.84	148.4	7.1×10^{-3}	~9	Cubes (d) and rods (e), former being minor product. 5 min reaction.
d	7.43×10^{-3}	1.84	247.6	2.38	~14	Rods and their assemblies. 10 min reaction.
e	2.48×10^{-3}	1.84	741.9	7.94×10^{-1}	~14	Hexagons. 5 min reaction.
f-g	1.6×10^{-3}	1.16×10^{-2}	7.25	none	~5-6	Smaller hexagons and rods. 5 min reaction.
h-l	2.3×10^{-2}	1.84	80.0	2.38	~14	Bipods, tripods, triangles/prisms, tetradecahedrons and hexagons. 10 min reaction. *Smaller crystallites*

Table A. Summary of experimental conditions and reaction stoichiometries employed during soft-hydrothermal (SHY) PbS nanoparticle syntheses. Morphologies of as-obtained crystallites, as shown in micrographs in Figure 1, are indicated. All concentrations in mol dm^{-3}.

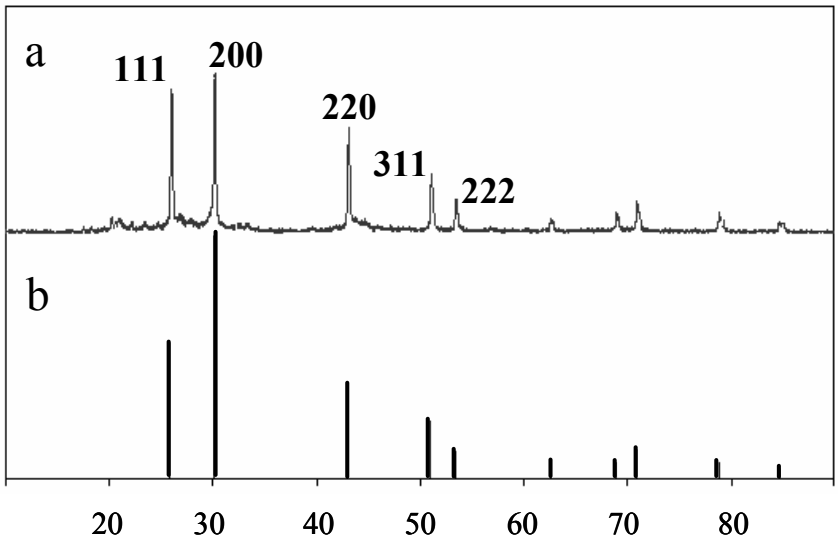

Figure A. *a.* Representative powder XRD of PbS nanocrystallites obtained during soft-hydrothermal (SHT) experiments. Diffractogram obtained for truncated cubic nanocrystals as shown in Figure 1*a*. Diffractogram of standard galena (crystalline PbS) reproduced from data given in JCPDS 05-0592.

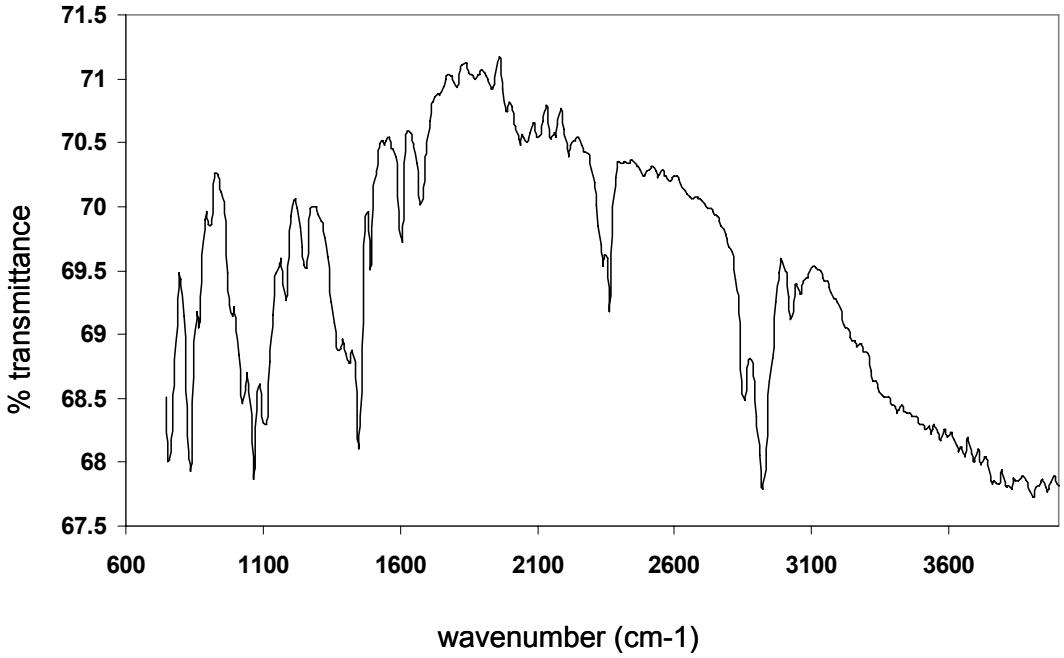

Figure B. FT-IR of thioglycerol-capped PbS nanocrystals obtained using the as-described soft-hydrothermal (SHT) route. The characteristic S-H stretching vibration of free 1-thioglycerol at ~2560 cm^{-1} is absent, as expected for coordinated thioglycerol. The strong absorption centred at ~ 2350 cm-1 is consistent with the presence of bipyridyl moieties. Similar features and conclusions have been reported in ref. 12.

[Prec]	[TG]	TG/Prec	EN	Morphology of crystallites
$1.8x10^{-3}$	0.11	61.1	0.15	5 min reaction, elliptical particles
$1.8x10^{-3}$	0.11	61.1	0.15	10 min; oblate nanoparticles
$1.8x10^{-3}$	0.11	61.1	0.15	20 min; particle growth
$1.8x10^{-3}$	0.11	61.1	0.15	30 min; aggregation of nanoparticles

Table B. Summary of experimental conditions and reaction stoichiometries employed during soft-hydrothermal (SHT) CdS nanoparticle syntheses. Morphologies of as-obtained crystallites, as shown in micrographs in Figure 3, are indicated. Concentrations in mol dm^{-3}.