

Supporting Information

Solvent-Assisted Tuning the Size and Shape of CsPbBr₃ Nanocrystals *via* Re-Dispersion Process at Ambient Condition

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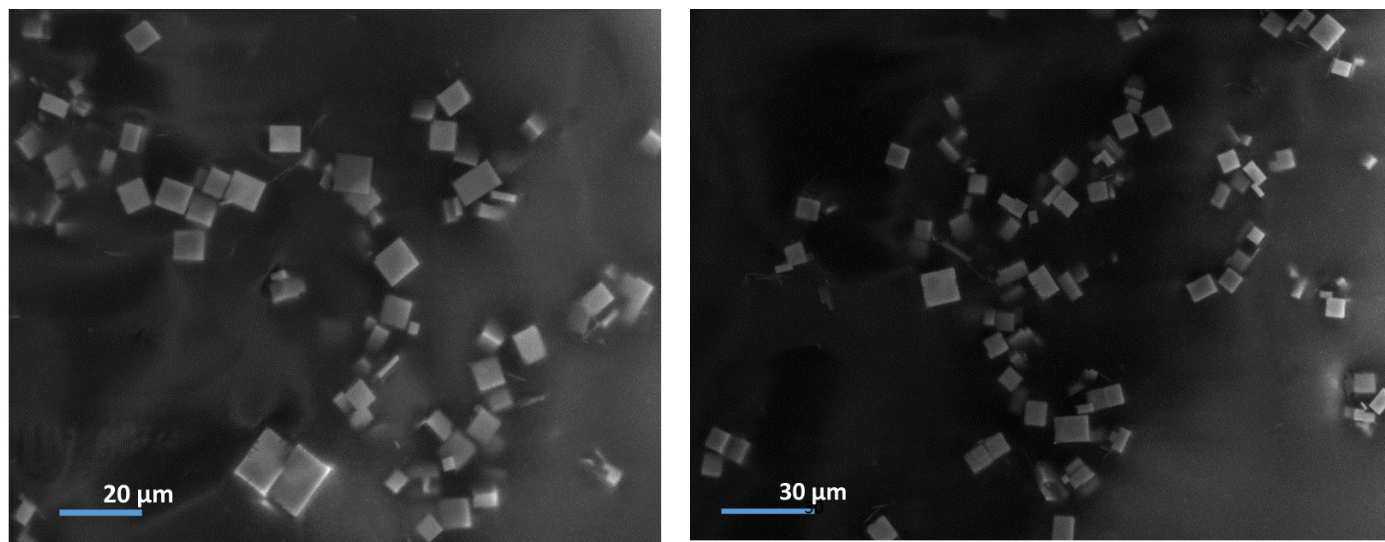


Figure S1.FE-SEM images of CsPbBr₃ microcubes obtained from THF solution.

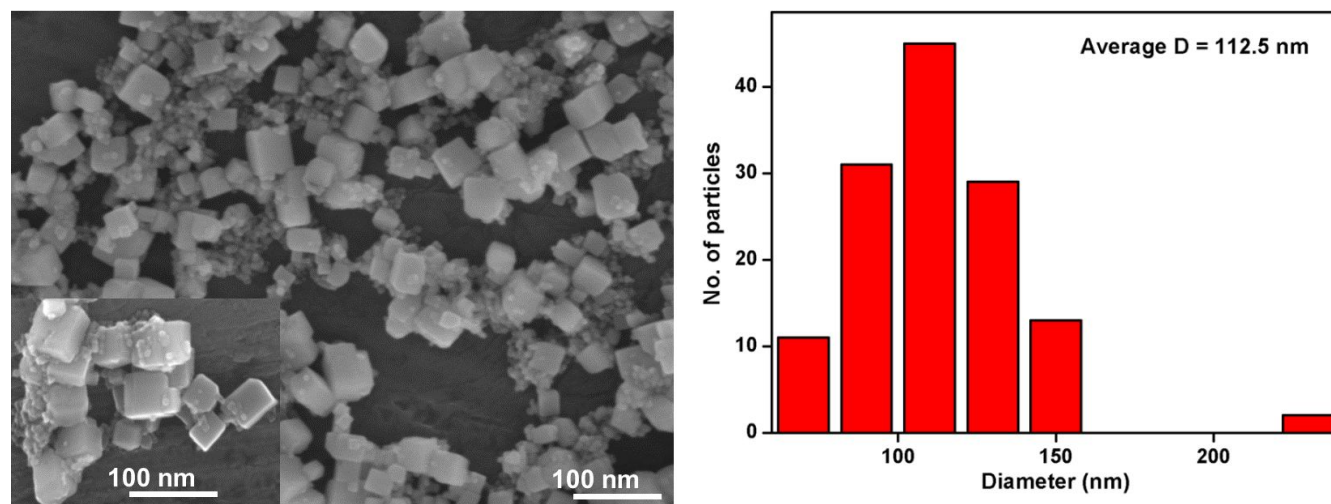


Figure S2.FE-SEM images and its histogram plot of CsPbBr₃ nanocubes obtained from ETA solution.

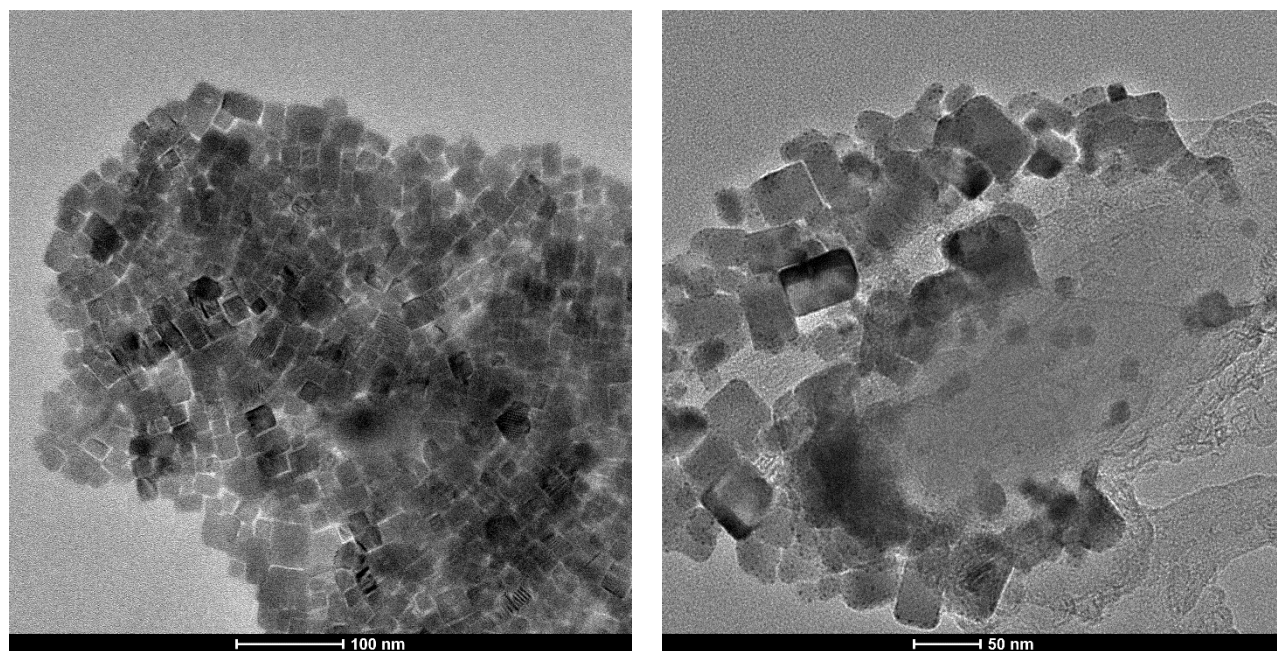
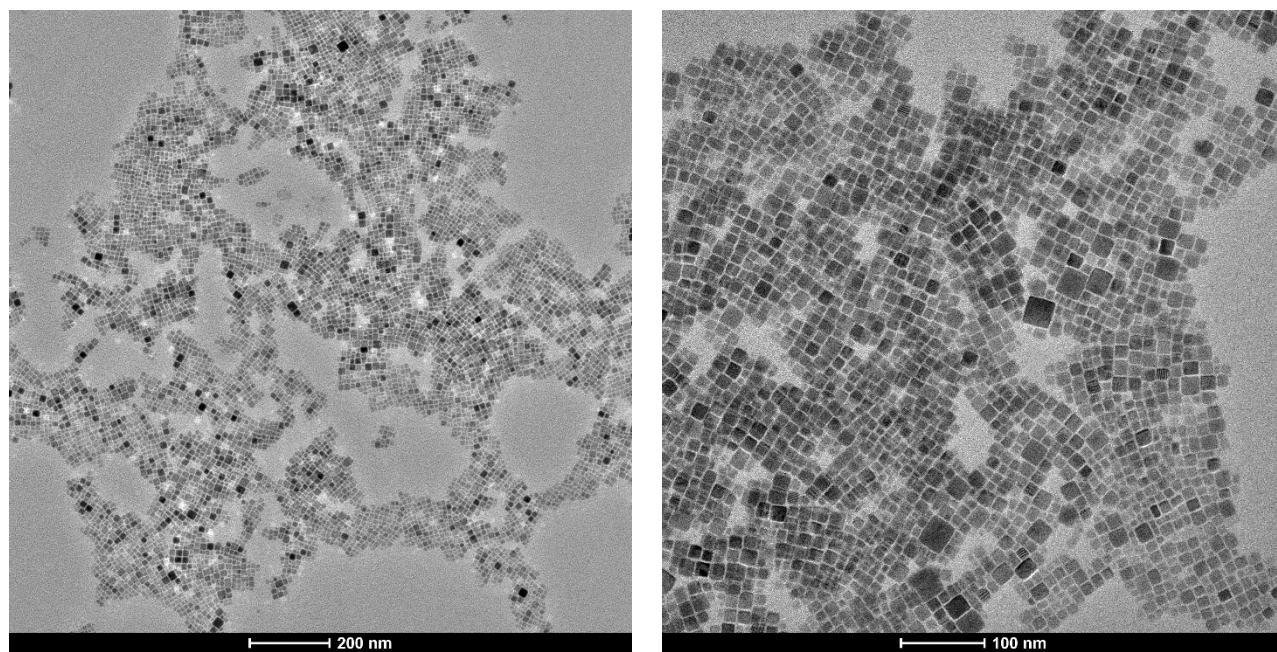


Figure S3. HR-TEM images of self-assembly of CsPbBr₃ nanocubes existed from DCM solution.



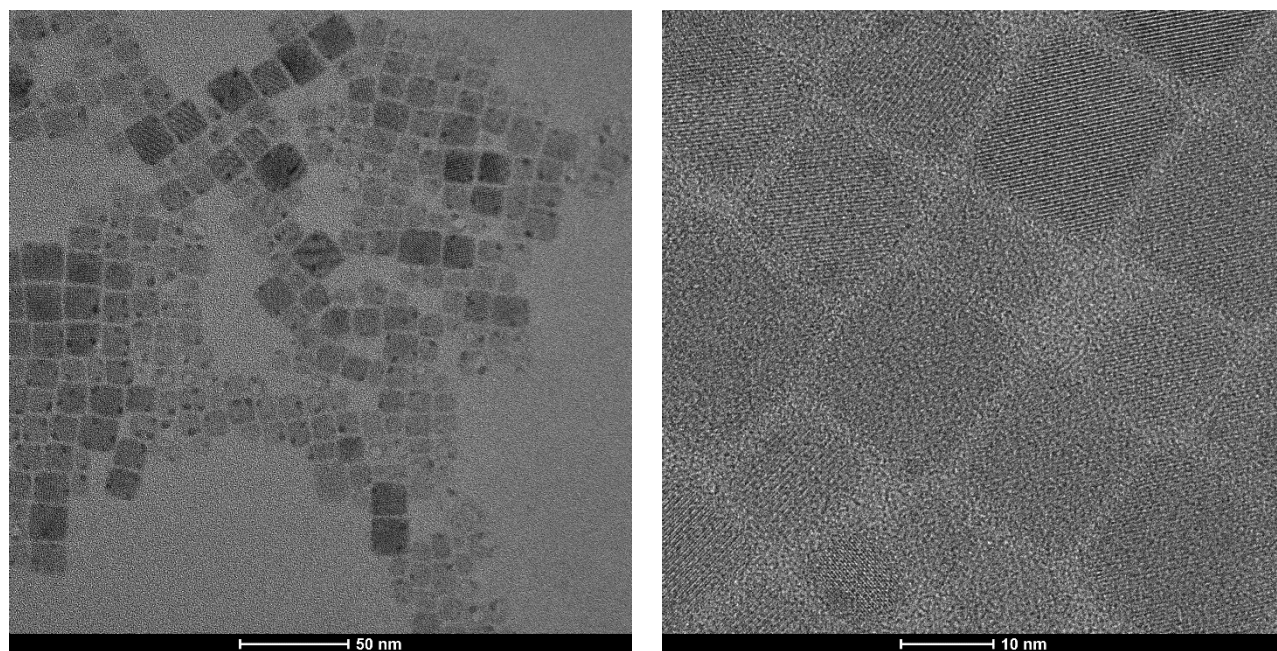
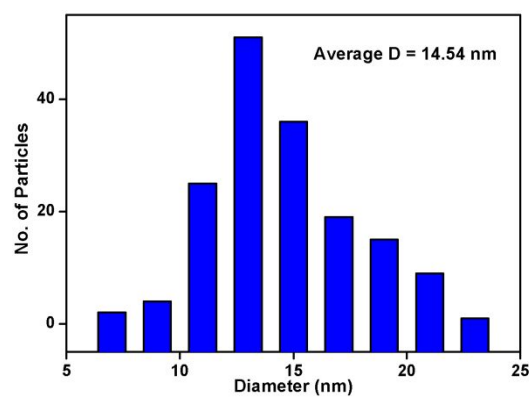
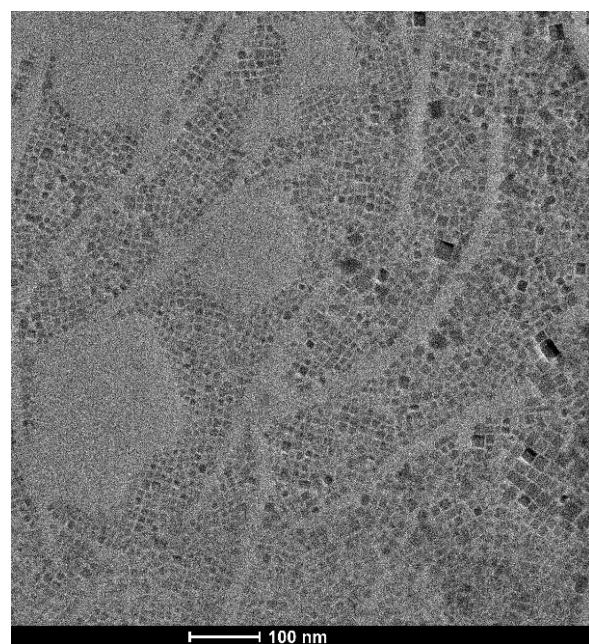


Figure S4. HR-TEM images of nanocubes of CsPbBr₃ NCs obtained from NPN solution.



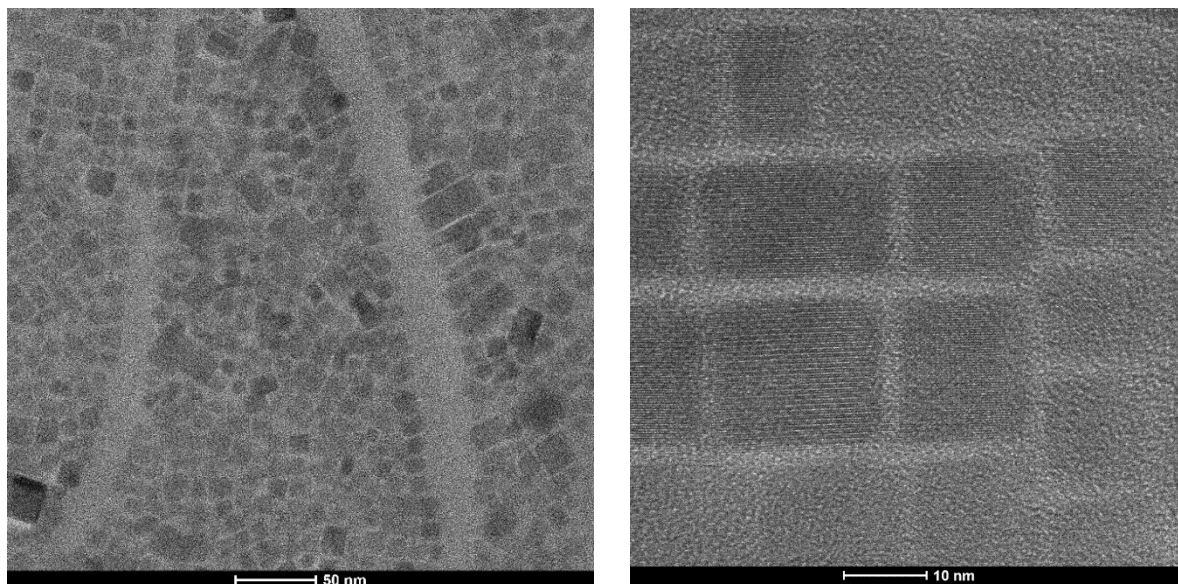


Figure S5. HR-TEM images and its histogram plot of nanocubes of CsPbBr_3 obtained from TLN solution.

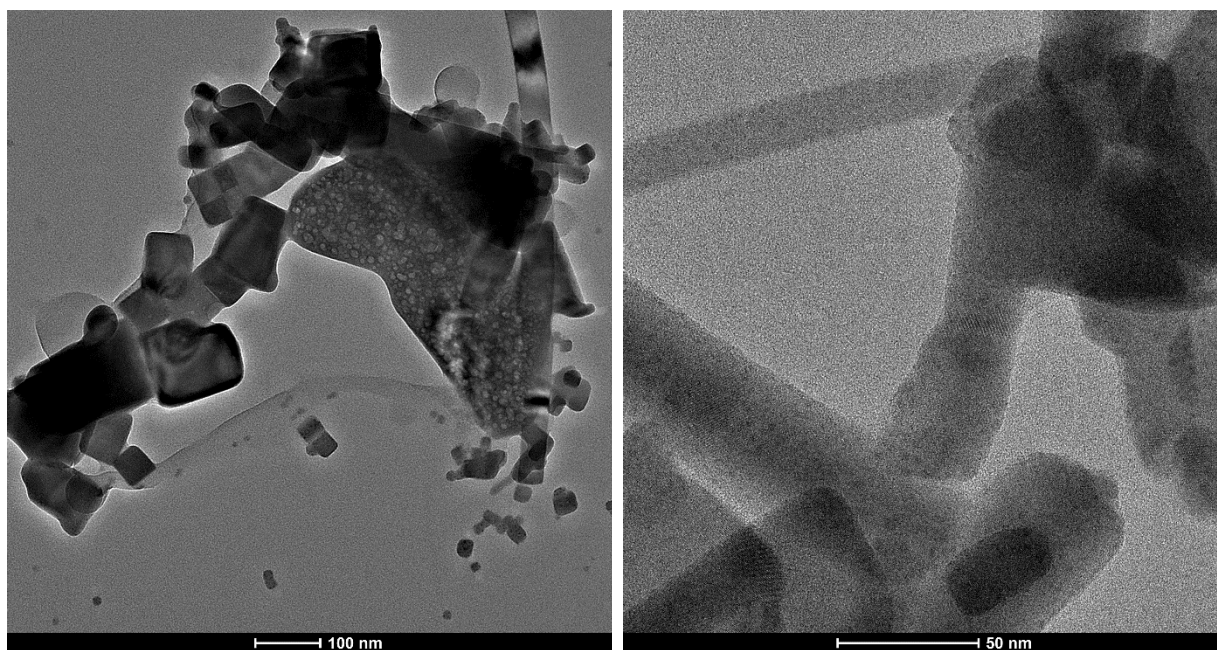


Figure S6. HR-TEM images of nanorods along with nanobars of $\text{CsPbBr}_3\text{NCs}$ existed in CLF solution.

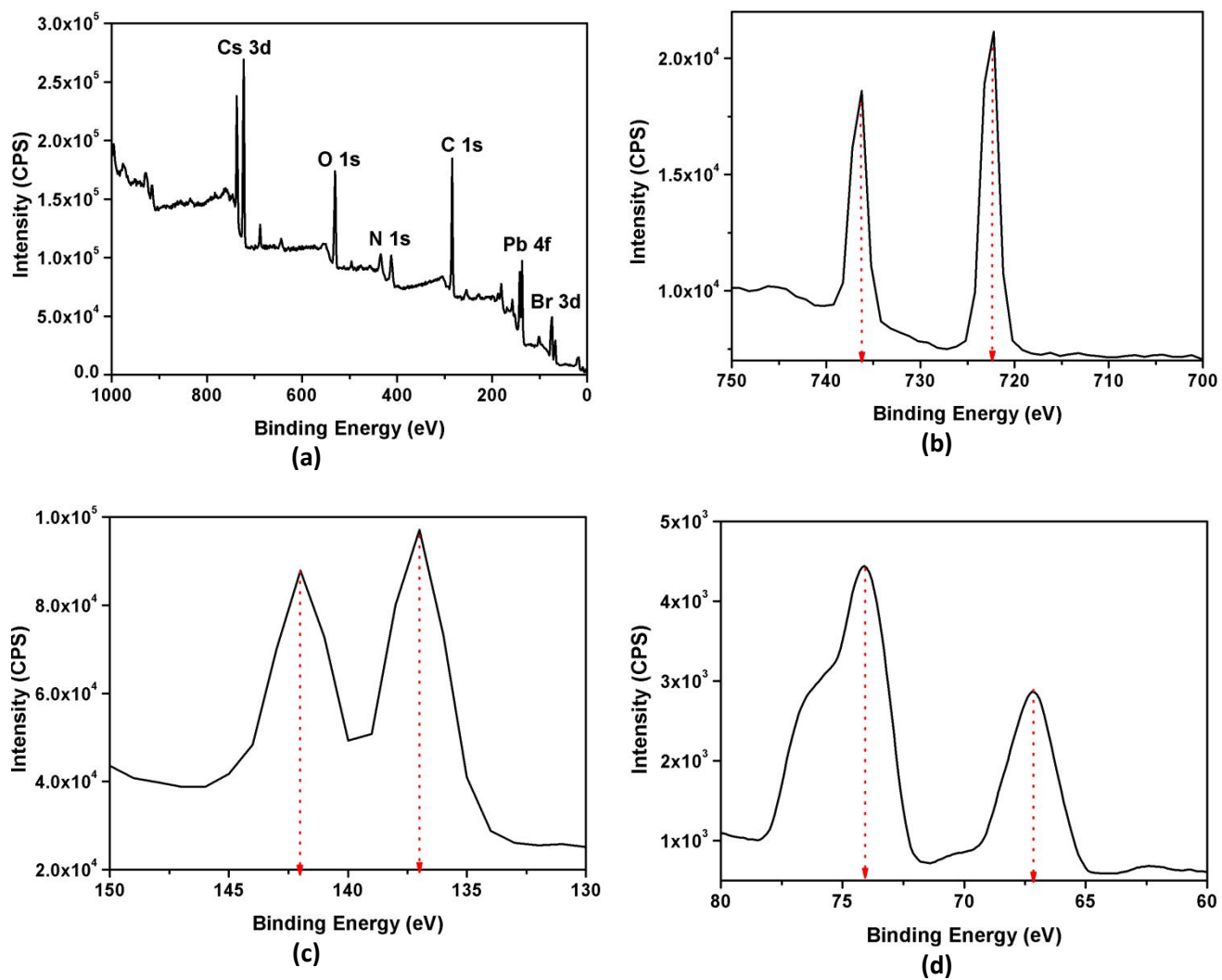


Figure S7. XPS spectral analysis of CsPbBr₃ microcubes. (a) presents combined for all, (b) Cs, (c) Pb, and (d) Br.

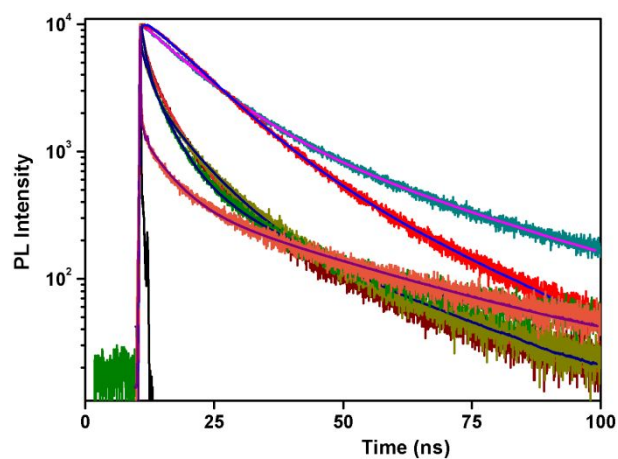
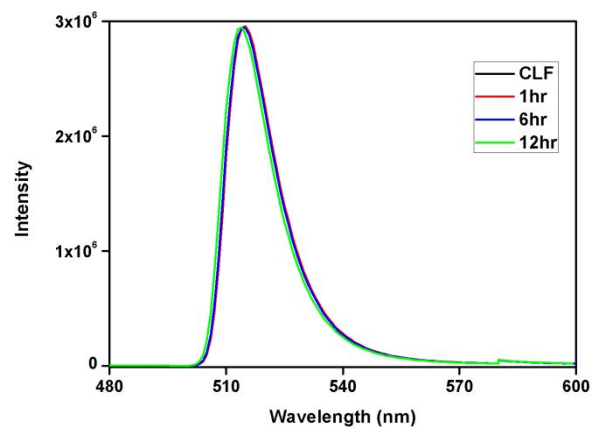
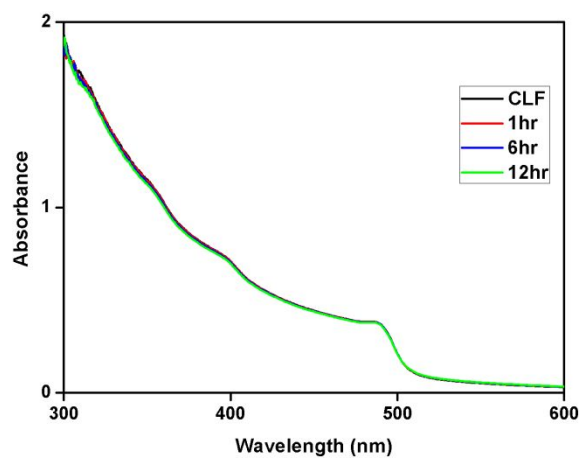
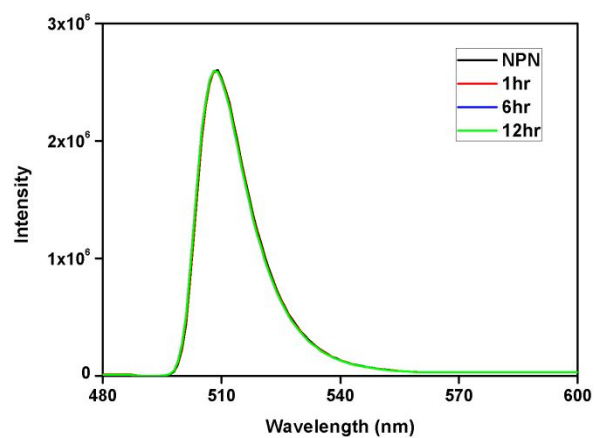
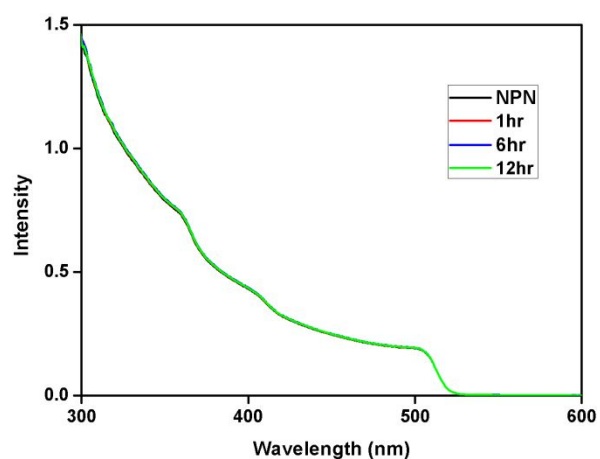
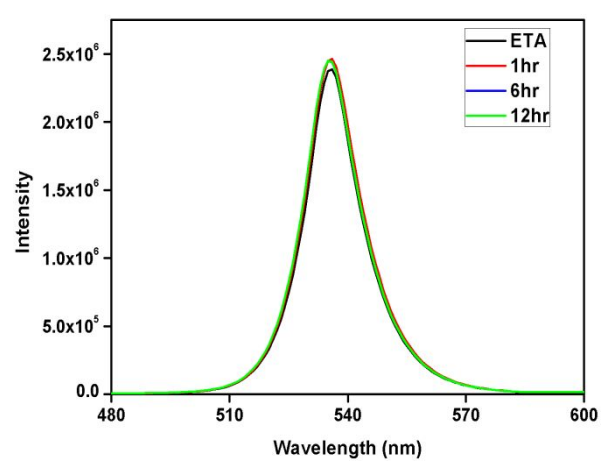
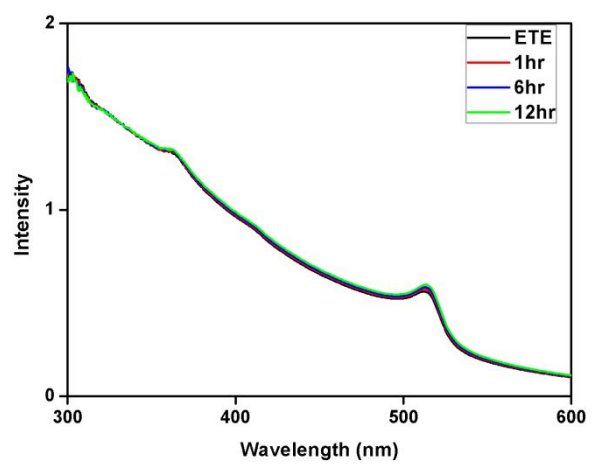
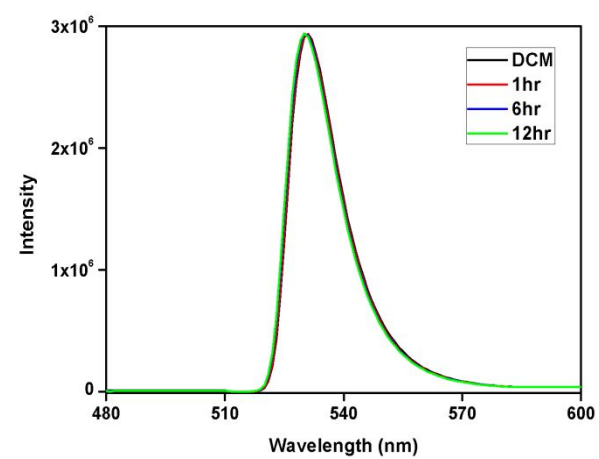
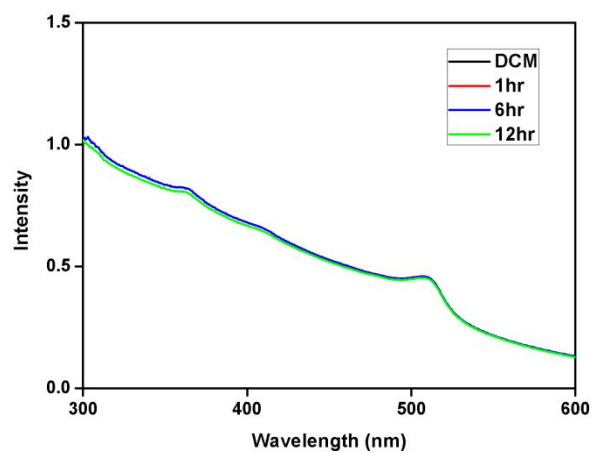
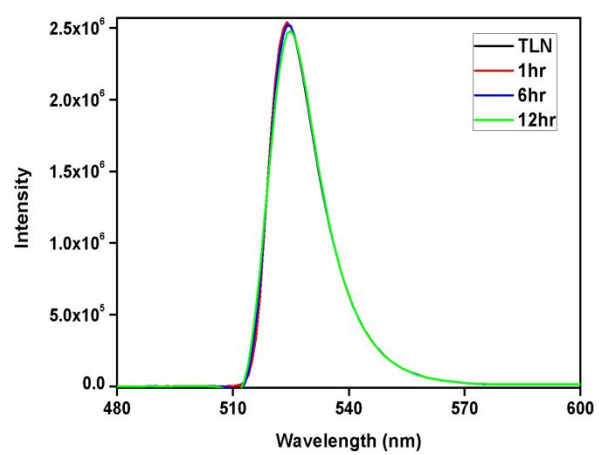
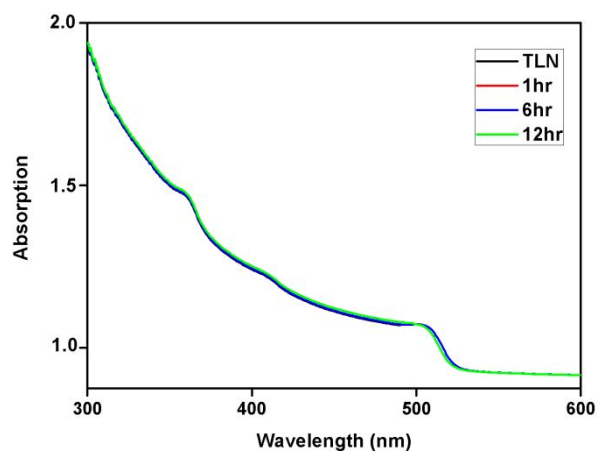


Figure S8. PL lifetime decay curves of all the various solution recorded at longer time. Colour code: Orange; THF, Green; ETA, Wine; DCM, Violet; NPN, Red; CLF, Dark Yellow; TLN.





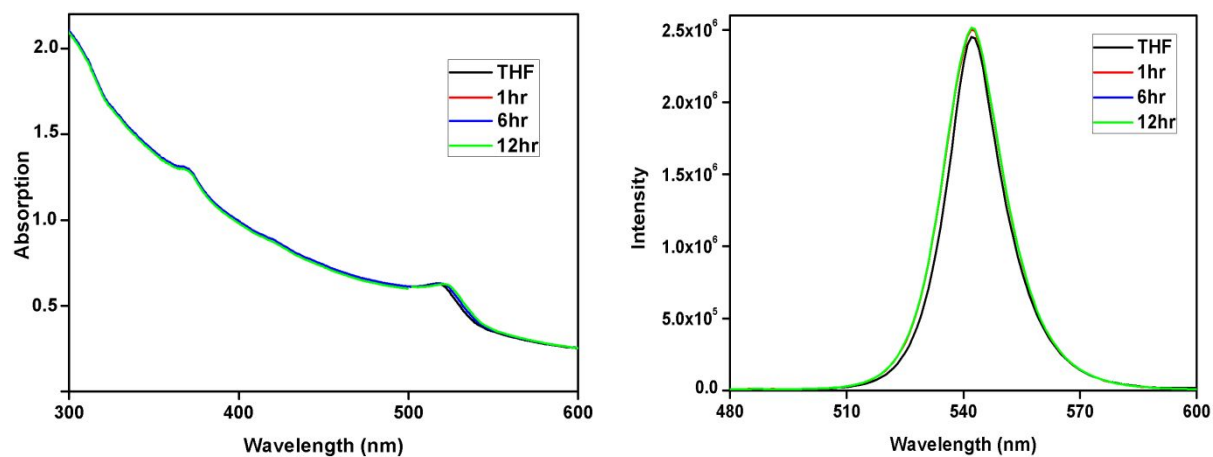
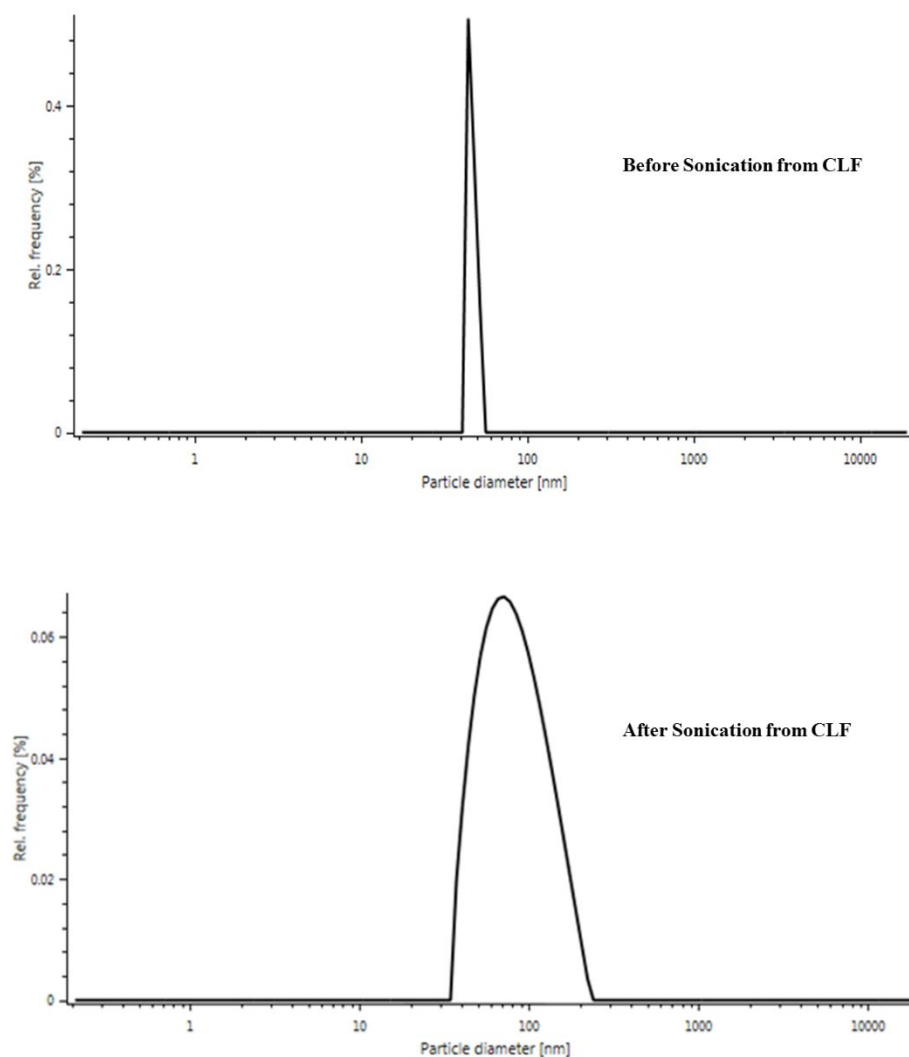


Figure S9. Time-dependent UV and PL of various cubes (nano to micro), self-assembly of nanocubes and shape-controlled nanorods recorded at room temperature for stability.



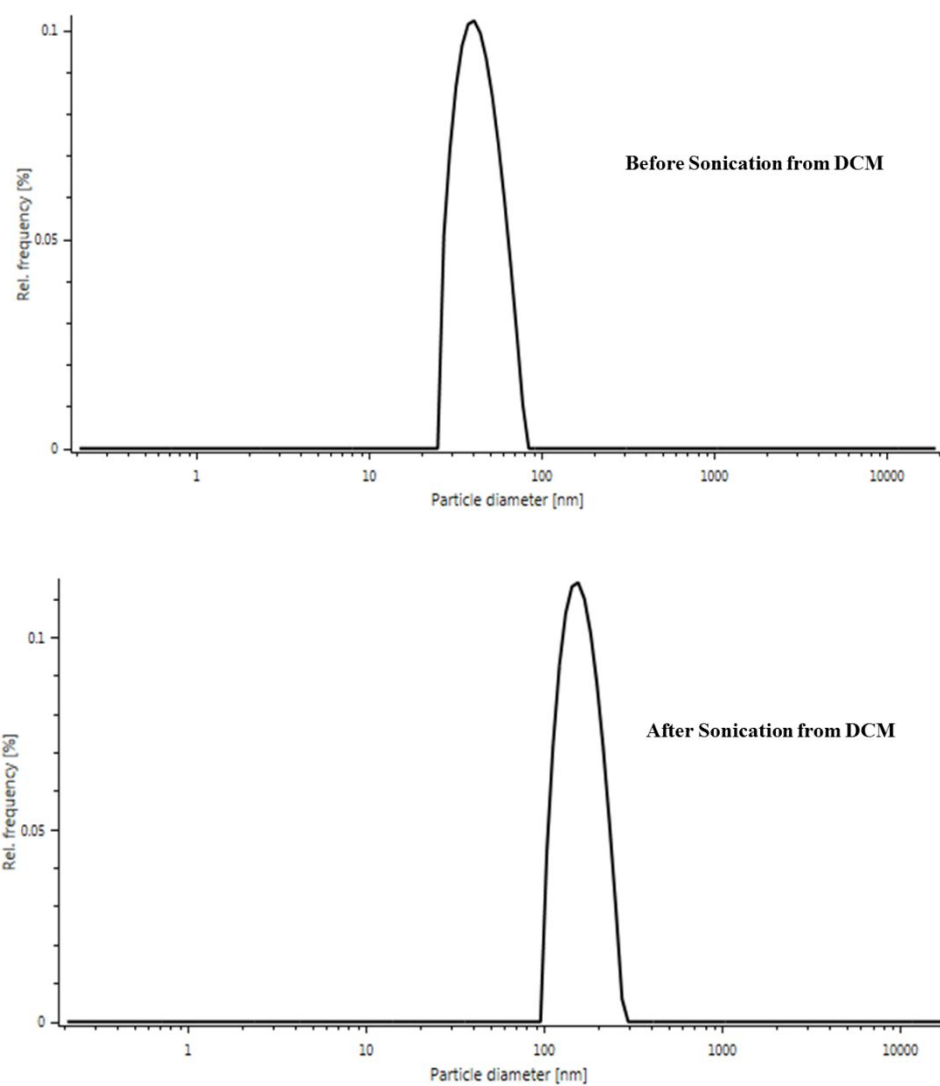


Figure S10. DLS measurement for shape-controlled nanorods and self-assembly of nanocubes, before and after sonication of the solution.

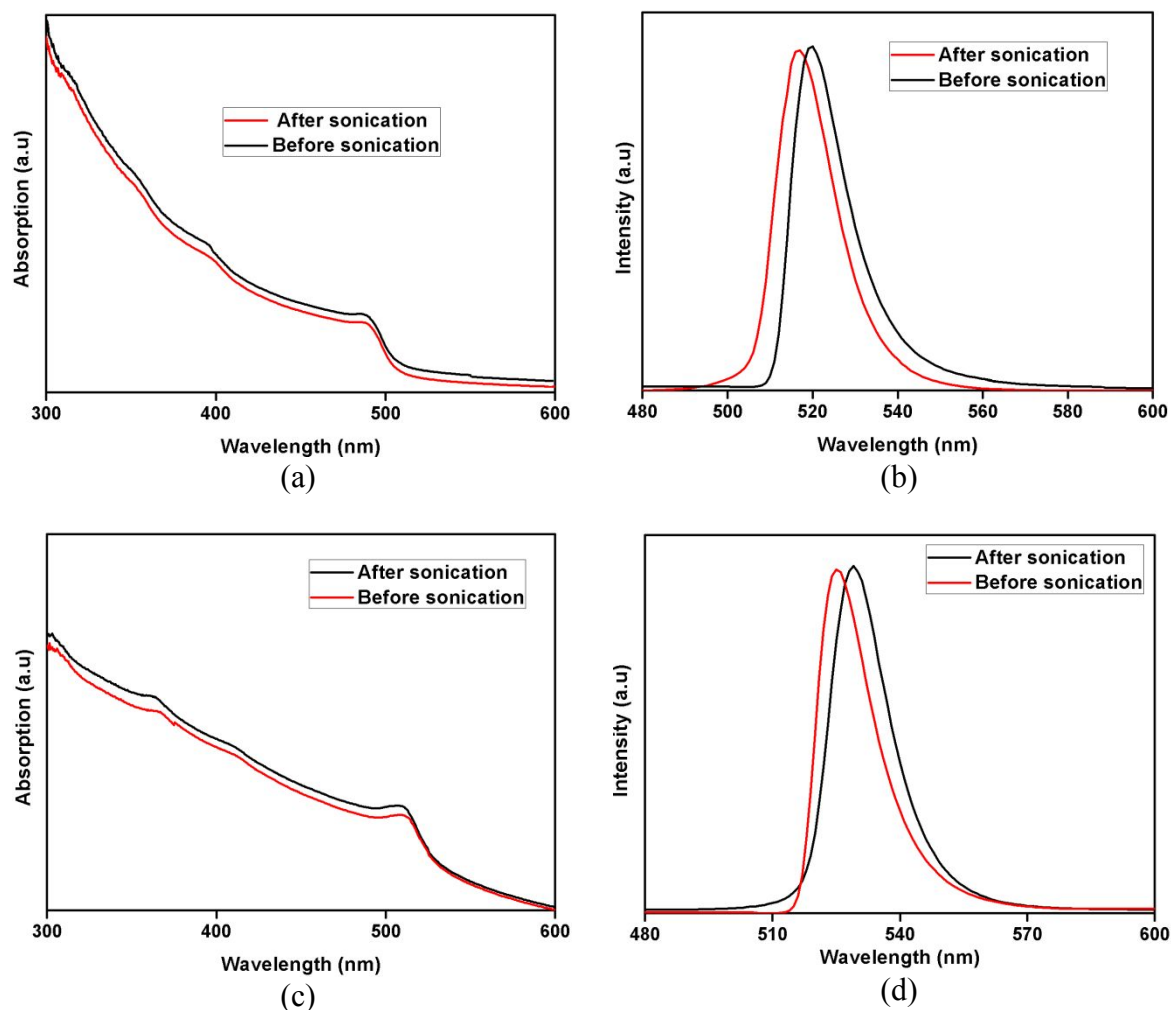
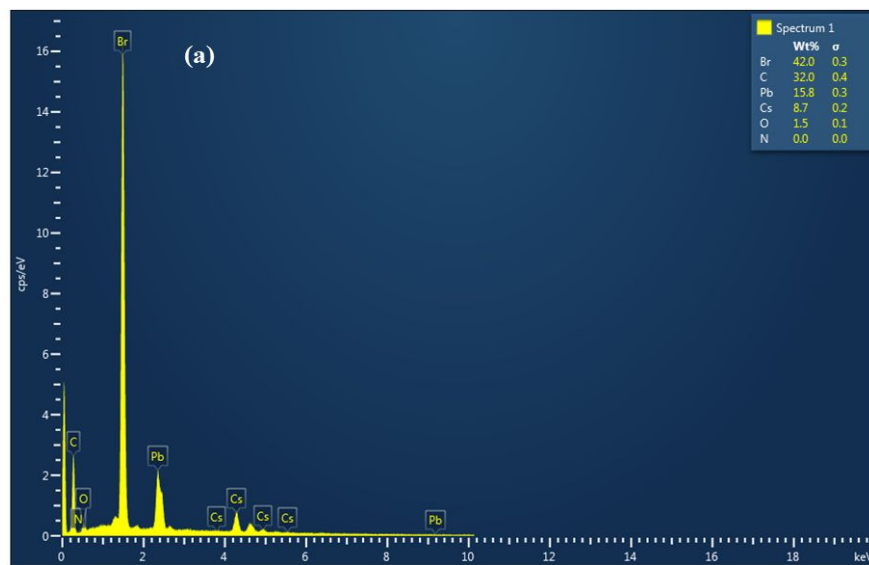


Figure S11. Providing the size and morphology depended absorption and PL of self-assembly of naocube (a, b) and shape-controlled nanorods (c, d).



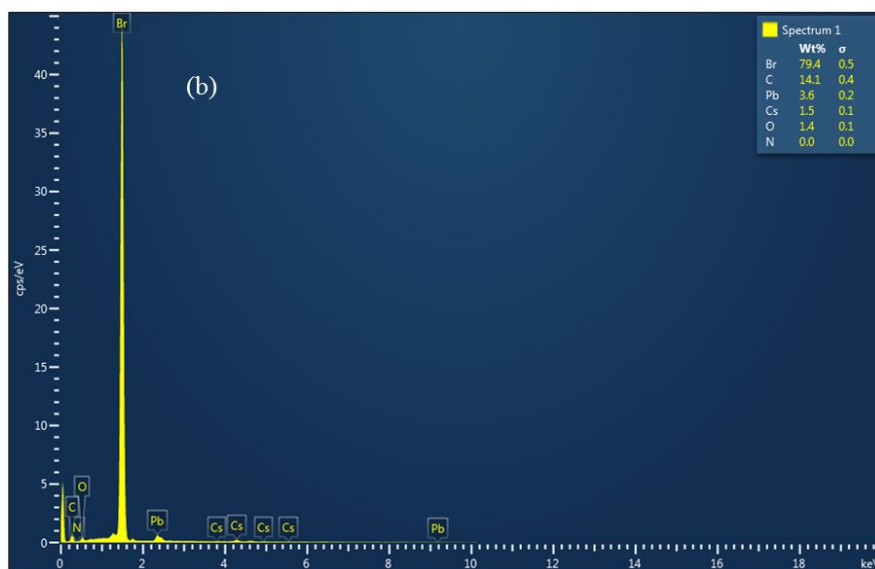


Figure S12. EDX analysis of CsPbBr₃. (a) larger size nanocrystal obtained from ETA solution, (b) Microcubes obtained from THF solution.

TableS1. Comparison the results of present microcubes with reported.

S. No	Results	Present	Reported
1	Absorption	524	525
2	PL	542	541
3	Band Gap	2.28	2.29
4	FWHM	20.91	22
5	Average Size	2.98 μm	0.5 μm or 505 nm
6	Method	Simple	Critical

Table S2.CompleteXPS peak analysis of CsPbBr₃microcubes.

Binding Energy (eV)	Element	Orbital	Origin
736	Cs	3d _{3/2}	Perovskite
722	Cs	3d _{5/2}	Perovskite
688	Pb	4p _{5/2}	Perovskite
530	O	1s	Ligand
411	N	1s	Ligand

280	C	1s	Ligand
142	Pb	4f _{5/2}	Perovskite
137	Pb	4f _{7/2}	Perovskite
74	Br	3d _{3/2}	Perovskite
67	Br	3d _{5/2}	Perovskite

Table S3. Absorption, PL peaks at maxima and band gap value of all the various solution

S. No.	Solution	Abs. max (nm)	PL. max (nm)	Band gap (eV)
1	PEN	504	509	2.40
2	CLF	506	514	2.37
3	DCM	514	529	2.33
4	ETA	520	535	2.31
5	THF	524	542	2.28

Table S4. TCSPC lifetime decay recorded at longer time for all the various solution.

S. No	Solution	% of α			Decay time (τ)			τ_{average} (ns)
		α_1	α_2	α_3	τ_1	τ_2	τ_3	
1	NPN	0.67	55.21	44.12	0.40	15.53	39.14	38.30($\chi^2 = 1.20$)
2	CLF	10.03	78.07	31.96	17.83	51.78	26.69	46.37($\chi^2 = 1.54$)
3	DCM	39.64	47.49	12.86	15.56	57.28	2.15	47.18($\chi^2 = 1.32$)
4	TLN	14.47	50.84	29.95	21.66	52.01	8.22	45.67($\chi^2 = 1.60$)
4	ETA	46.95	37.75	15.30	4.30	0.20	50.23	40.36($\chi^2 = 1.35$)
5	THF	22.08	16.40	61.52	52.63	0.44	42.84	45.75($\chi^2 = 1.72$)