Supporting Information

Efficient and stable Cyan-emitting $CsPbBr_3$ Quantum Dots with Zinc Bromide Inorganic Passivation

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PLQY measurement

The PLQY measurements of $CsPbBr_3$ QDs were performed using a relative method with quinine sulfate as the standard sample at room temperature. The standard sample is quinine sulfate, with 57.7% PLQY in 0.1 mol/L H_2SO_4 under 355 nm excitation source while the cuvette is 10 mm. The refractive index of 0.1 mol/L H_2SO_4 was 1.3443 and that of 1.3981 for toluene at 355 nm were applied, respectively.[1] According to the following formula, PLQY of $CsPbBr_3$ QDs were obtained,

$$\Phi_1/\Phi_2=F_1/F_2*A_2/A_1*(n_1/n_2)^2$$

where Φ_1 and Φ_2 are the quantum yields of the standard and sample, respectively. A_1 and A_2 are the absorbances of the standard and sample at the excitation wavelength; F_1 and F_2 are the integrated emission intensity of the standard and sample; n_1 and n_2 are the refractive indexes of the standard solution and sample solution.

Scheme S1. The schematic diagram for the ligand exchange of cyan-emissive $CsPbBr_3$ PQDs. The photograph of C-PQDs solution without and with UV lamp irradiation.

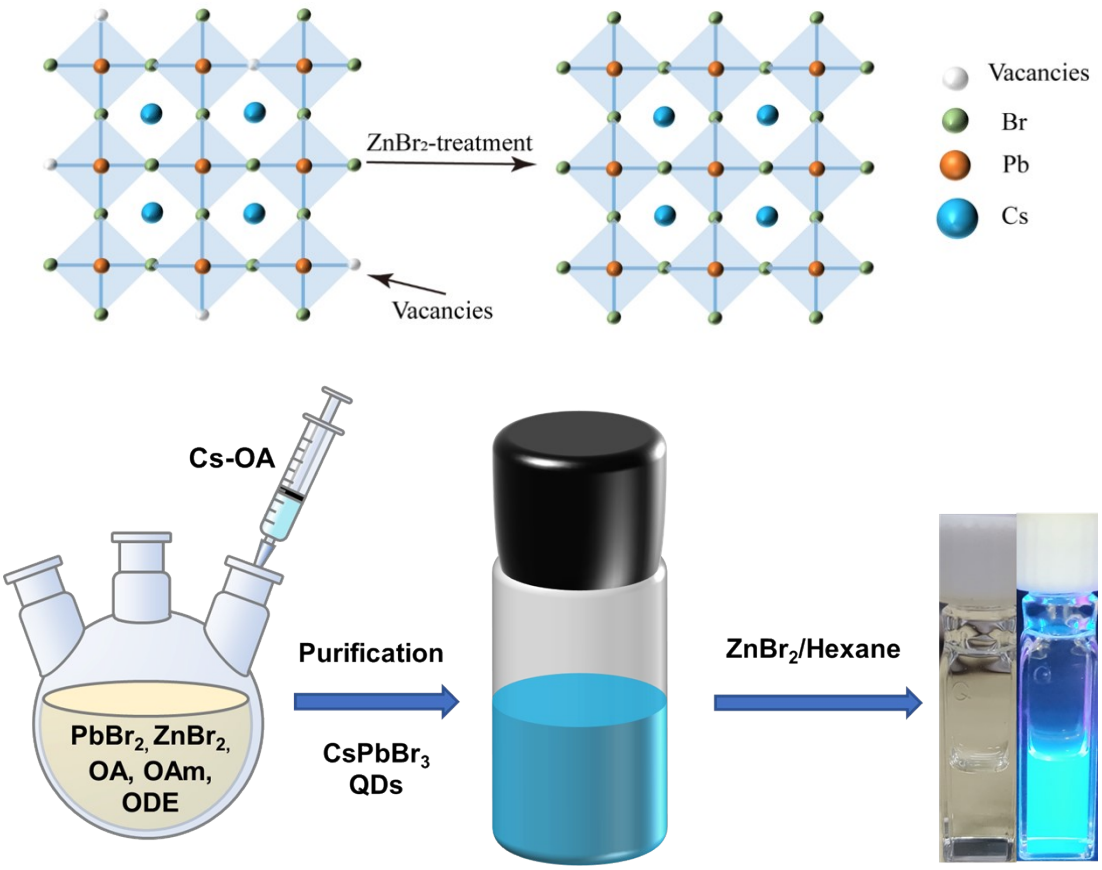

Fig. S1 (a)TEM image and (b) the size histogram of as-synthesized C-PQDs.

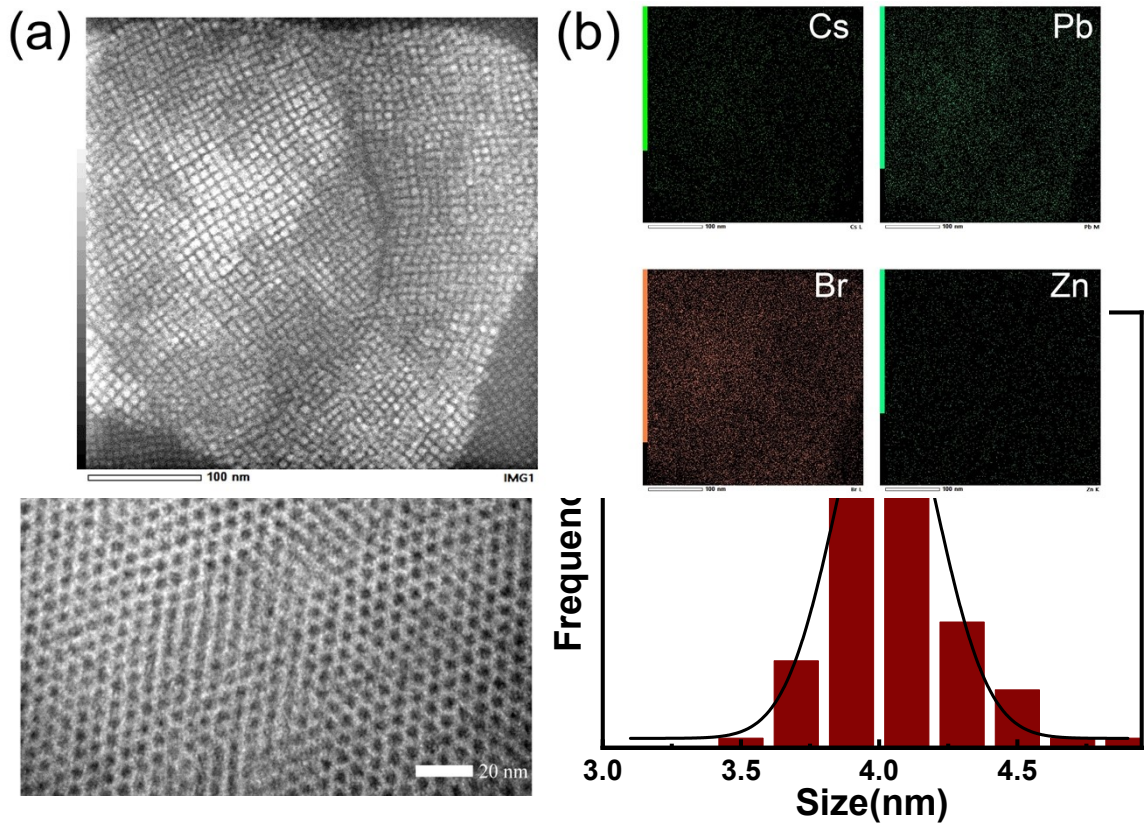

Fig. S2 (a) High-angle annular dark-field scanning TEM (HAADF-STEM) image and (b) elemental mappings of $ZnBr_2$-treatment $CsPbBr_3$ QDs.

Table S1. Surface elements content of EDS for $ZnBr_2$-treated $CsPbBr_3$ QDs.

Element	Wt (%)	At (%)
Br	41.99	59.57
Pb	34.99	19.14
Cs	21.14	18.02
Zn	1.88	3.27

Table S2. Surface elements content of EDS for as-synthesized $CsPbBr_3$ QDs.

Element	Wt (%)	At (%)
Br	39.21	58.14
Pb	38.61	22.08
Cs	22.18	19.78
Zn	0	0

Table S3. The fitting results of the PL decay curves of the C-PQDs.

QDs	A_1 (%)	A_2 (%)	τ_1 (ns)	τ_2 (ns)	τ_{avg} (ns)
As synthesized	73.7%	27.3%	4.00	6.96	5.16 ns
+10 µL	67.7%	32.3%	4.65	7.46	5.86 ns
+20 µL	40%	60%	3.72	7.06	6.2 ns
+30 µL	22.7%	77.3%	2.87	8.25	7.76 ns
+40 µL	29.9%	70.1%	3.5	6.75	6.13 ns
+50 µL	55.1%	44.9%	4.37	7.92	6.5 ns
+60 µL	64.2%	35.8%	4.39	6.91	5.57 ns

Table S4. Comparison of optical performances and stability of $ZnBr_2$ treated $CsPbBr_3$ perovskites.

Materials	PL peak (nm)	PLQY (%)	Storage stability	Refs
$ZnBr_2$-$CsPbBr_3$ NCs	518	78	60% (6 d)	[2]
$ZnBr_2$/hexane-$CsPbBr_3$ QDs	514	93	90% (13 h)	[3]
$ZnBr_2$-$CsPbBr_3$ NCs Room-temperature synthesis	511	86	81% (28 d)	[4]

DDAB/$ZnBr_2$-CsPbBr3 NCs	515	95	85% (14 d)	[5]
$CsPbBr_3$ nanoplatelets	461	90	90% (50 d)	[6]
Zn-doped $CsPbX_3$ NCs	408	85	N/A	[7]
Nd^{3+}-doped $CsPbBr_3$ NCs	459/484/494	90/75/78	90% (30 d)	[8]
$EDABr_2$:NaBr-treated [a)] $CsPbBr_3$ NCs	480	52.2	N/A	[9]
$ZnBr_2$-treated $CsPbBr_3$ QDs	480	96.4	92% (30 d)	This work

[a)]EDABr: Ethylenediammonium bromide

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