Electronic Supplementary Material (ESI) for Nanoscale.

Improved stability of $CsPbBr_3$ perovskite quantum dots by suppressing the interligand proton transfer and applying the polystyrene coating

Yuting Cai [a], Le Wang*[b], Tianliang Zhou[a], Peng Zheng[a], Ye Li*[a], Rong-Jun Xie*[a]

[a]College of Materials, Xiamen University, Simingnan-road 422, Xiamen 361005, P. R. China.

[b]College of Optical and Electronic Technology, China Jiliang University, Hangzhou, Zhejiang 310018, P. R. China.

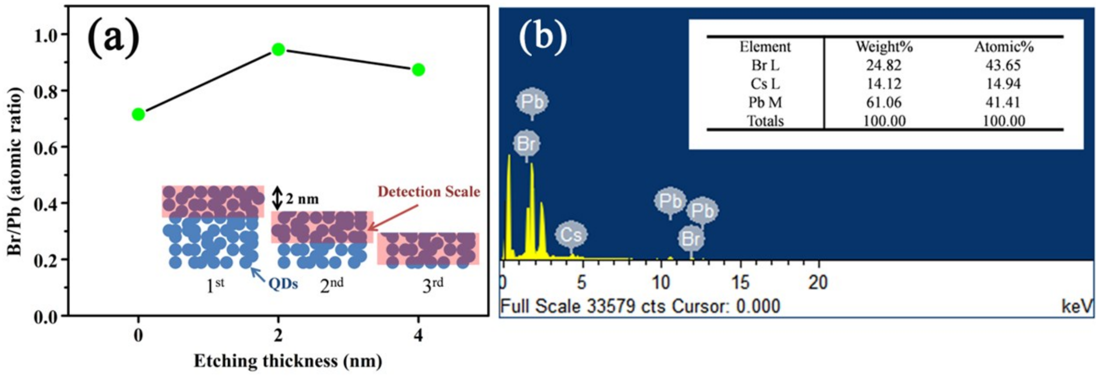

Fig. S1 (a) Br/Pb ratio before and after etching with Ar^+ ions; (b) EDS spectrum of $CsPbBr_3$ QDs. The insets of (a) and (b) present schematic of the relationship between detection depth of XPS and the size of QDs and element content information of QDs, respectively.

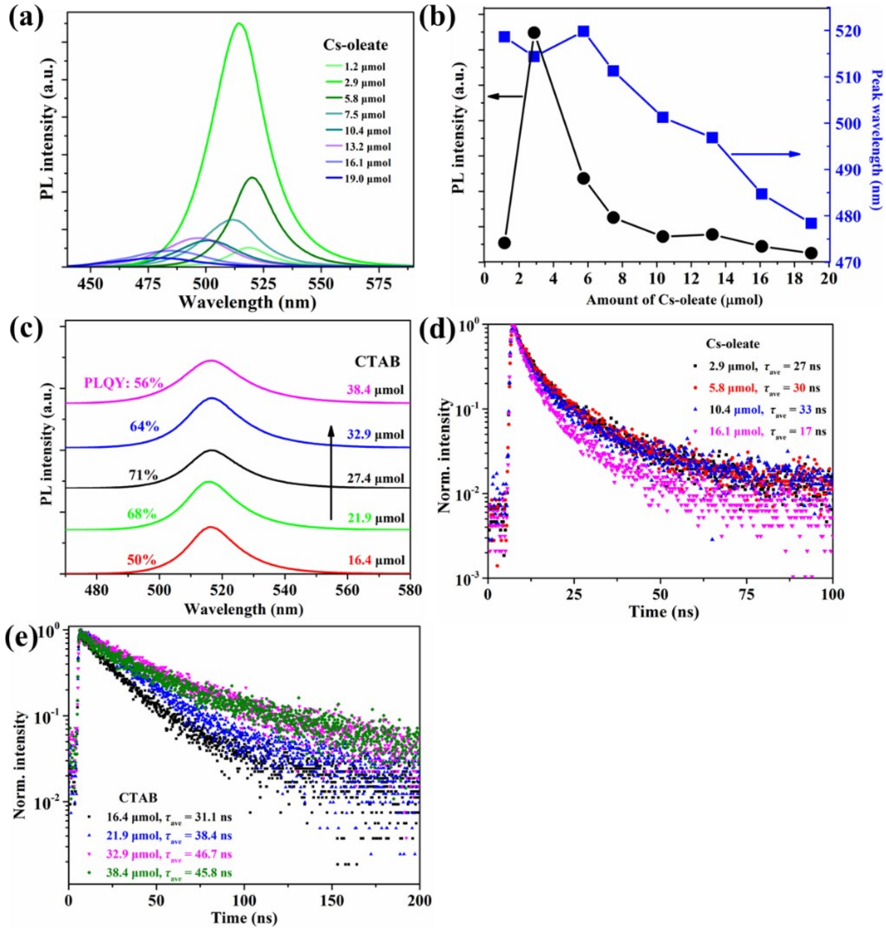

Fig. S2 (a) PL spectra and (b) the corresponding PL intensity and wavelength of $CsPbBr_3$ PQDs (the volume of CTAB is 0.5 mL) *versus* the volume of Cs-oleate. (c) The spectra of $CsPbBr_3$ PQDs synthesized using 0.025 mL Cs-oleate and different volume of CTAB. (d)-(e) The corresponding time-resolved PL decays.

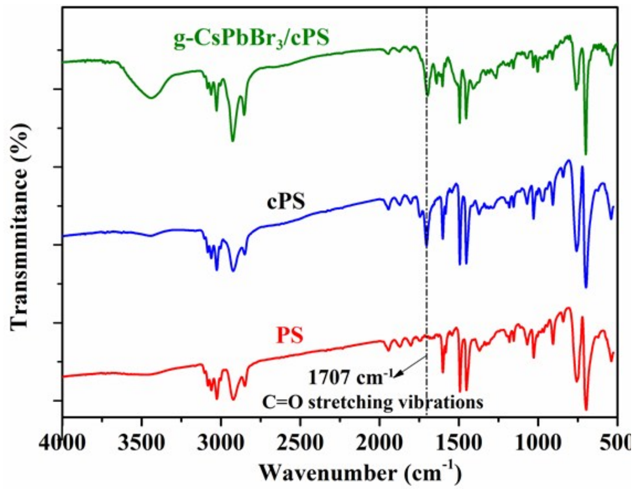

Fig. S3 The FTIR spectra of PS, cPS, and g-$CsPbBr_3$/cPS.

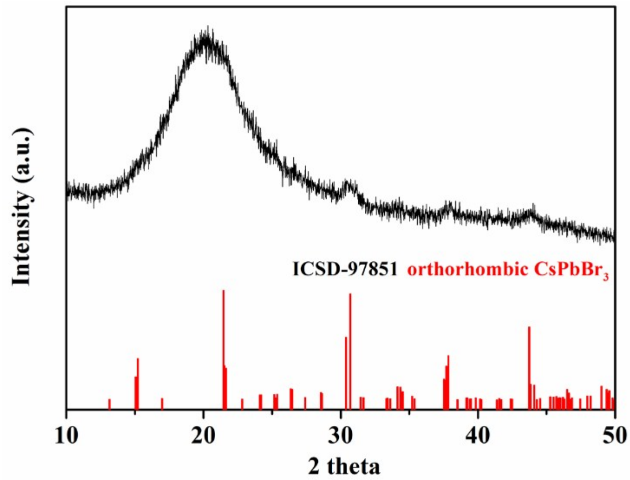

Fig. S4 XRD pattern of g-$CsPbBr_3$ /cPS.

Table S1 Fitted parameters of the decay curve of $CsPbBr_3$ QDs synthesized under different conditions.

Recipes Cs-oleate (μL)	CTAB (mL)	τ_1 (ns)	A_1	τ_2 (ns)	A_2	τ_3 (ns)	A_3	χ^2	τ_{ave} (ns)
25	0.5	1.8	16.8	7.8	51.2	34.6	32.0	1.098	27
50	0.5	2.2	20.6	8.6	48.5	38.9	30.9	1.091	30
90	0.5	1.7	22.7	8.2	47.9	41.7	29.4	1.205	33
140	0.5	1.3	19.1	5.1	55.4	23.1	25.5	1.108	17
25	0.3	0.5	1.4	16.3	54.3	38.7	44.3	1.063	31.1
25	0.4	0.9	1.1	13.3	14.7	39.9	84.2	1.066	38.4
25	0.6	1.6	0.7	9.5	2.7	46.9	96.6	1.022	46.7
25	0.7	0.2	0.3	18.5	7.1	46.6	92.6	1.106	45.8