Supporting Information

Direct in situ photolithography of ultra-stable $CsPbBr_3$ quantum dot arrays based on crosslinking polymerization

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Figures

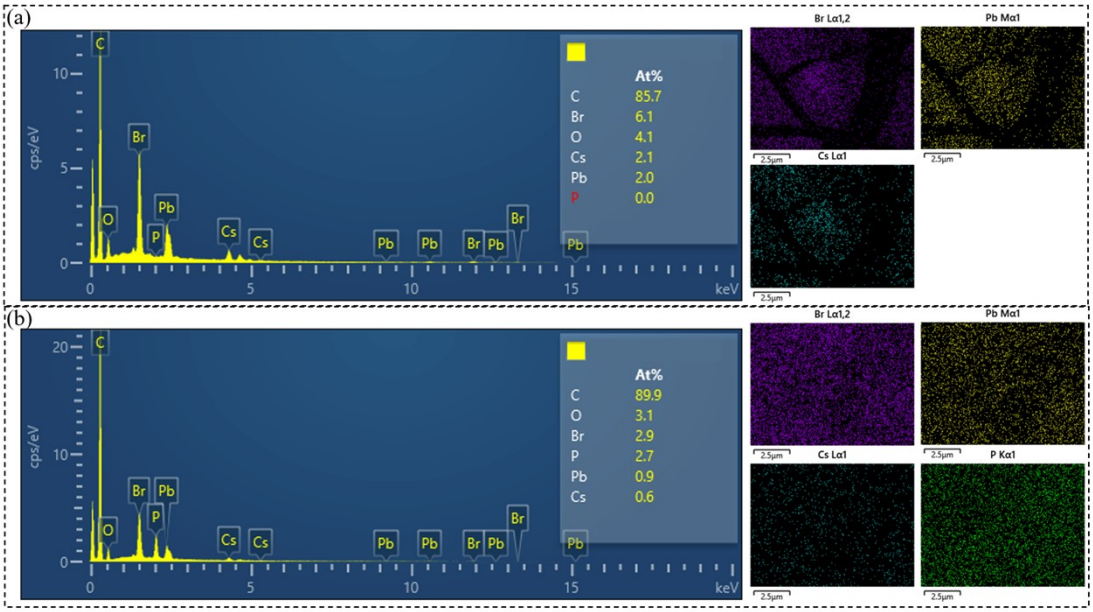

Figure S1 The EDS of the (a) pristine and (b) XBPO-treated $CsPbBr_3$ PQDs

[1] These people contribute equal to this work.

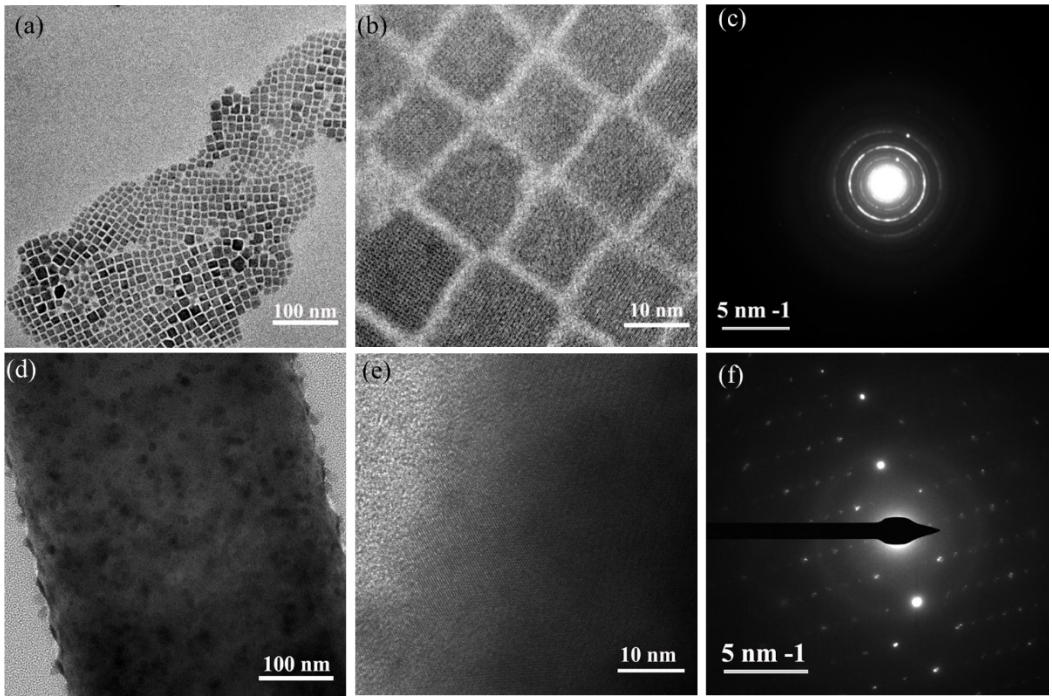

Figure S2 (a) and (b) TEM micrographs and (c) high-resolution diffraction patterns of $CsPbI_3$ PQDs treated with XBPO after aged for a week; (d) and (e) TEM and (f) high-resolution diffraction patterns of traditional $CsPbI_3$ PQDs after one week of aging.

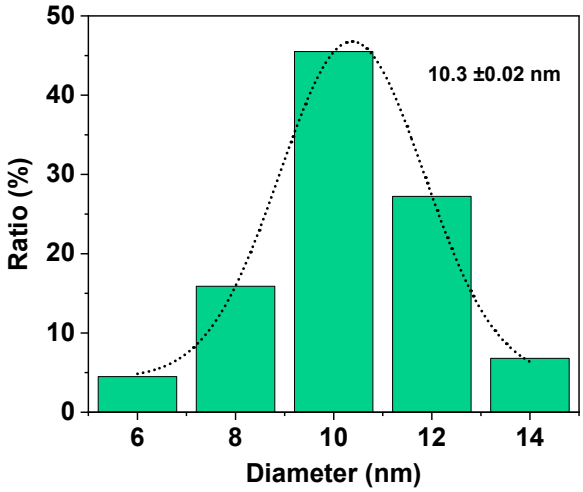

Figure S3. Size distribution of the XBPO-treated $CsPbI_3$ PQDs

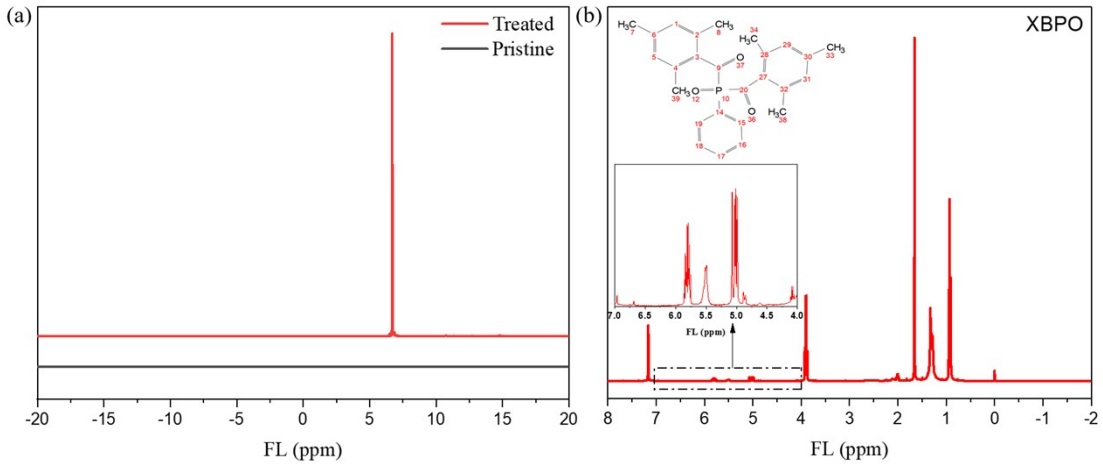

Figure S4. (a) ^{31}P NMR spectrum of the Pristine and XBPO treated PQDs; (b) 1H NMR spectra of phenyl phsosphorus dioxide XBPO

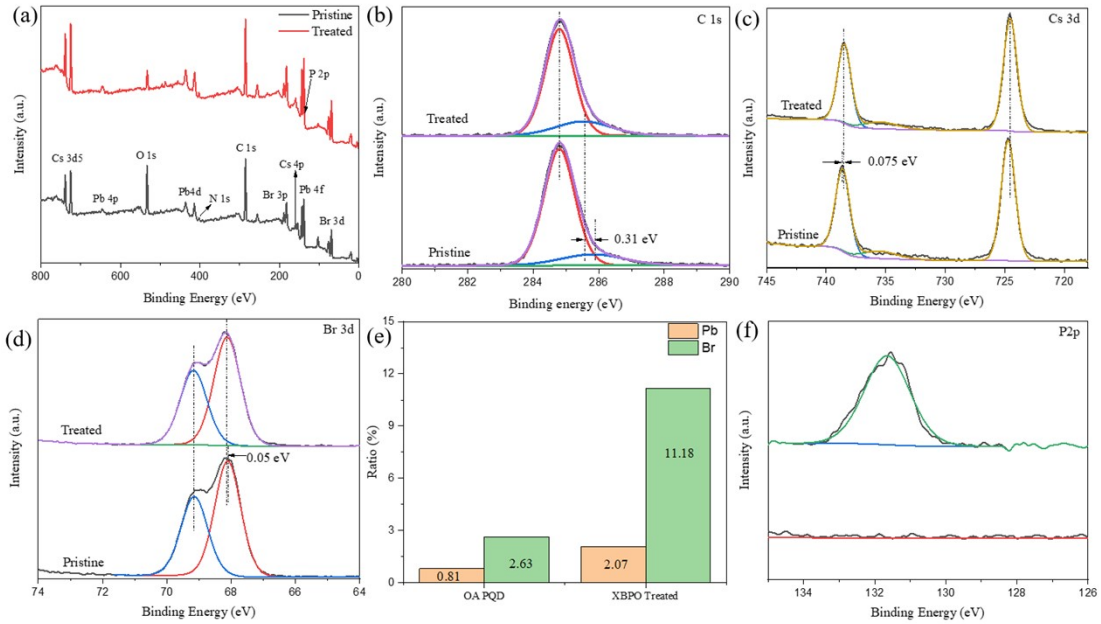

Figure S5. XPS spectra of XBPO treated and Pristine PQDs. Full XPS spectra of (a) Pristine and XBPO treated PQDs; high-resolution XPS spectra of (b) C1s, (c) Cs 3d, (d) Br 3d, (e) the Br/Pb atomic ratio (f) P2p of the $CsPbBr_3$ PQDs.

Tables

Table S1. The optical properties of $CsPbBr_3$ QDs

	PL (nm)	FWHM (nm)	PLQY (%)	τ_1 (ns)	B_1 (%)	τ_2 (ns)	B_2 (%)	τ_{int} (ns)	χ^2
Pristine	513	21	66.7	7.43	63.80	16.33	36.12	10.65	1.34
Treated	517	17	99.5	21.22	75.52	58.22	24.48	30.28	1.02

B_i is the pre-exponential factor in the model function for exponential component analysis.

χ^2 is the reduced chi-square value of the decay fitting.

τ_{int} is the average lifetime. $\tau_{int}=\sum B_i \cdot \tau_i$

Table S2. The optical properties of $CsPbI_3$ QDs

	PL (nm)	FWHM (nm)	PLQY (%)	τ_1 (ns)	B_1 (%)	τ_2 (ns)	B_2 (%)	τ_{int} (ns)	χ^2
Pristine	662	49	44.5	5.28	32.76	13.86	67.24	11.05	1.14
Treated	687	45	91.7	25.88	47.08	134.19	52.92	83.10	1.00

B_i is the pre-exponential factor in the model function for exponential component analysis.

χ^2 is the reduced chi-square value of the decay fitting.

τ_{int} is the average lifetime. $\tau_{int}=\sum B_i \cdot \tau_i$

Table S3. The optical properties of $CsPbI_3$ QDs after 3 months

	PLQY (%)	τ_1 (ns)	B_1 (%)	τ_2 (ns)	B_2 (%)	τ_{int} (ns)	χ^2
Treated	70.5	25.42	47.78	96.59	52.22	62.59	1.19

B_i is the pre-exponential factor in the model function for exponential component analysis.

χ^2 is the reduced chi-square value of the decay fitting.

τ_{int} is the average lifetime. $\tau_{int}=\sum B_i \cdot \tau_i$