

Enhanced Stability of CsPbBr₃ Nanocrystals through Al₂O₃ and Polymer Coating

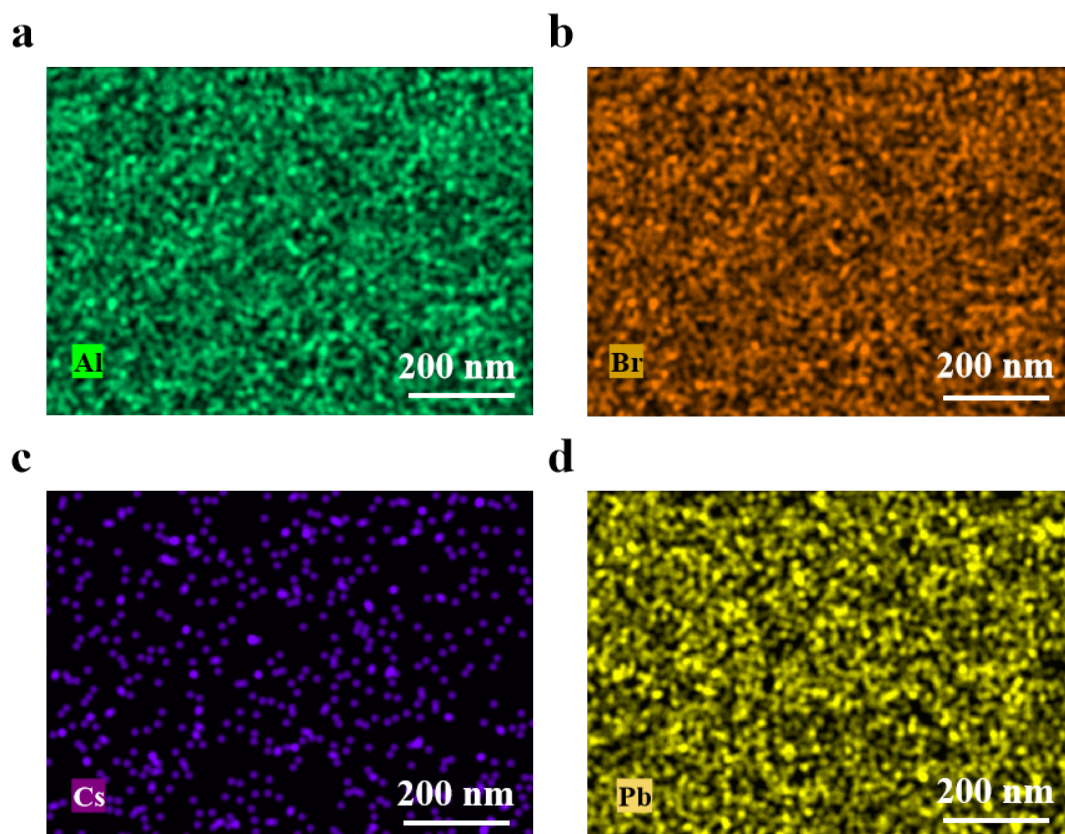


Fig. S1. EDS mapping images of (a) Al, (b) Br, (c) Cs and (d) Pb of CsPbBr₃@Al₂O₃/EPDM.

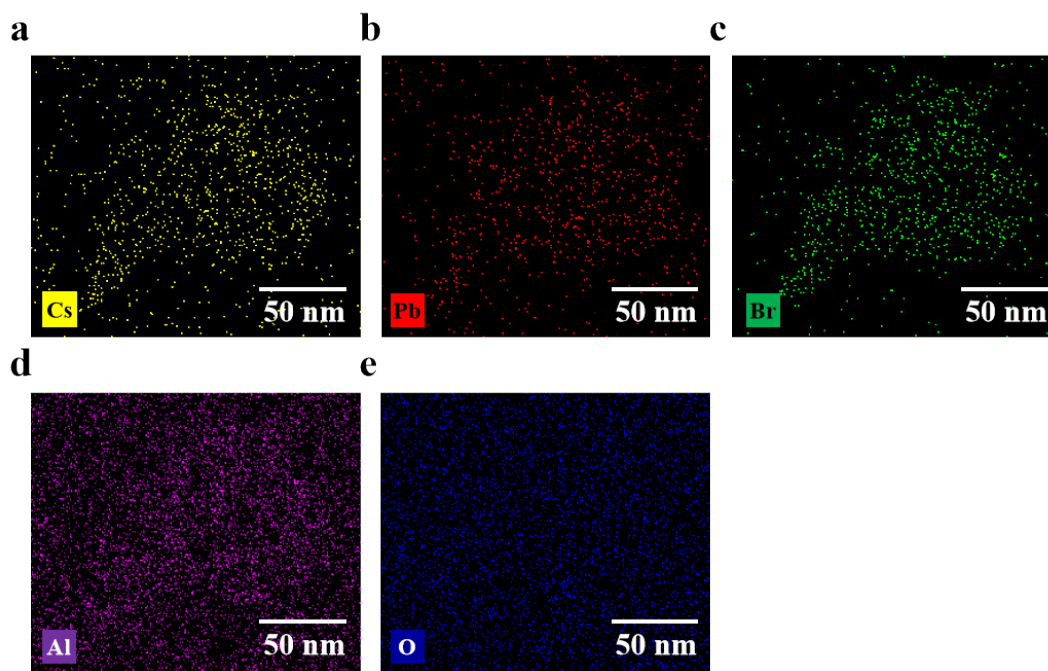


Fig. S2. EDS mapping images of (a) Cs, (b) Pb, (c) Br, (d) Al and (e) O in CsPbBr₃@Al₂O₃/EPDM.

a

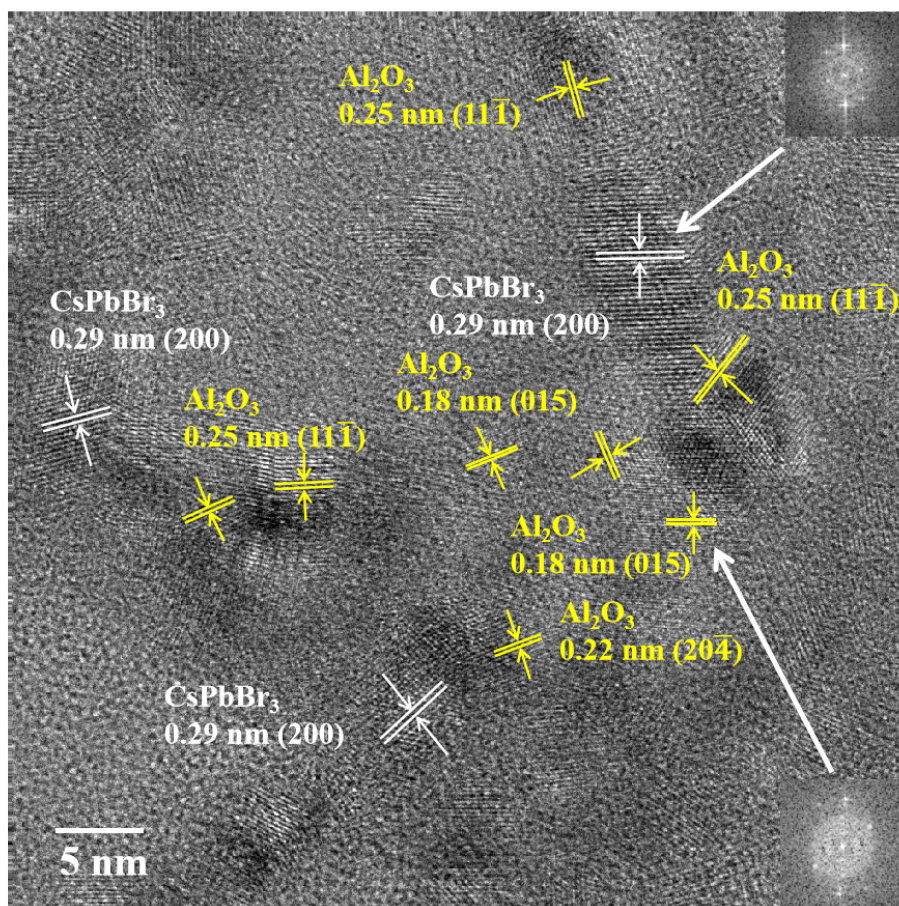


Fig. S3. (a) HRTEM image of CsPbBr₃@Al₂O₃.

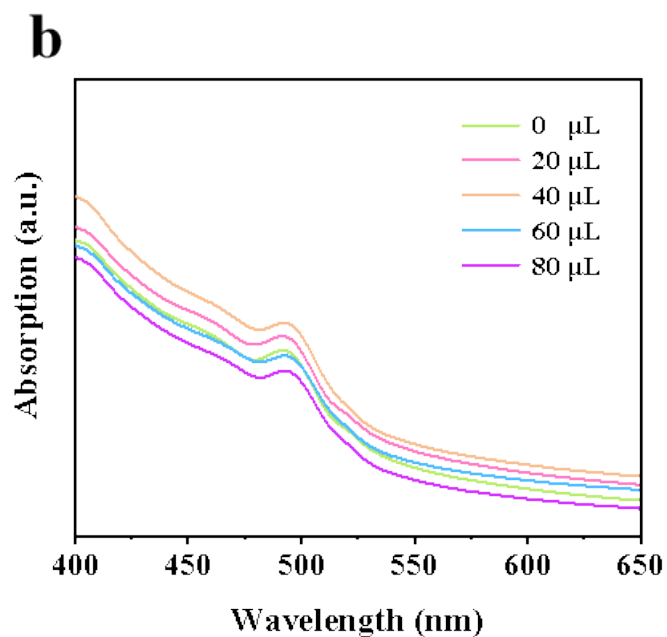


Fig. S4. (a) UV-Vis absorption spectra of CsPbBr₃@Al₂O₃/EPDM with different triethyl aluminum additions.

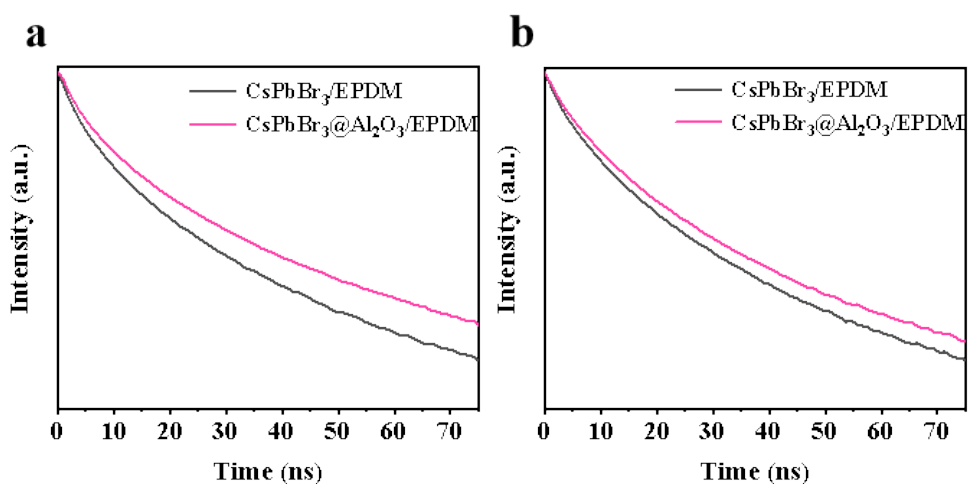


Fig. S5. (a) TRPL comparison chart when CsPbBr₃@Al₂O₃/EPDM and CsPbBr₃/EPDM were immersed in water for seven days. (b) TRPL comparison chart when CsPbBr₃@Al₂O₃/EPDM and CsPbBr₃/EPDM were immersed in water for fifteen days.

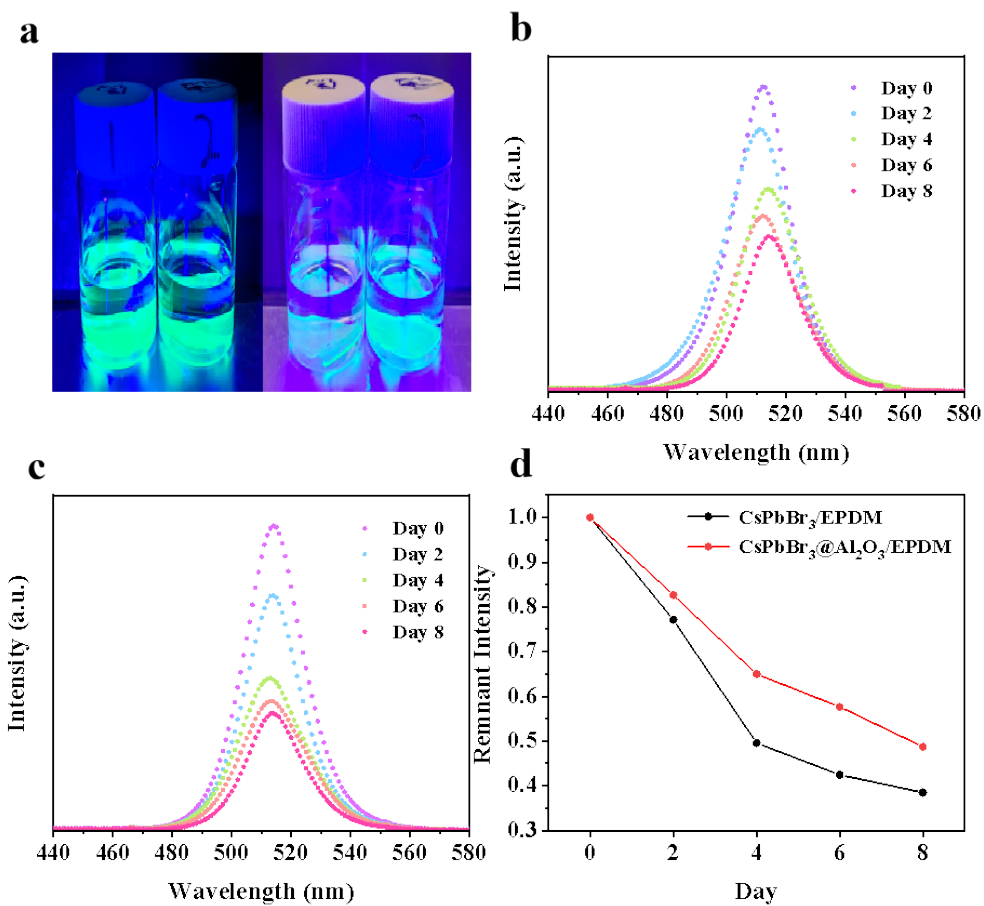
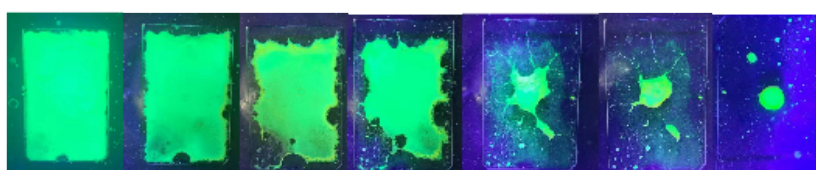


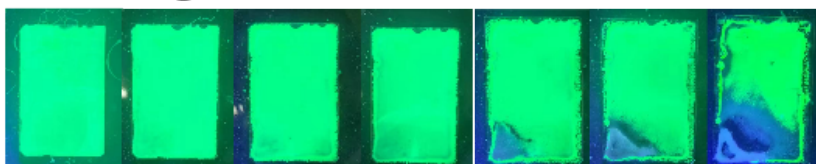
Fig. S6. (a) Macroscopic comparison of CsPbBr₃/EPDM and CsPbBr₃@Al₂O₃/EPDM before and after soaking in ethanol. (b) The emission spectra of CsPbBr₃@Al₂O₃/EPDM. (c) The emission spectra of CsPbBr₃/EPDM. (d) Scatter plot comparison.

CsPbBr₃



0 min 20 min 40 min 60 min 80 min 100 min 120 min

CsPbBr₃@Al₂O₃



0 min 20 min 40 min 60 min 80 min 100 min 120 min

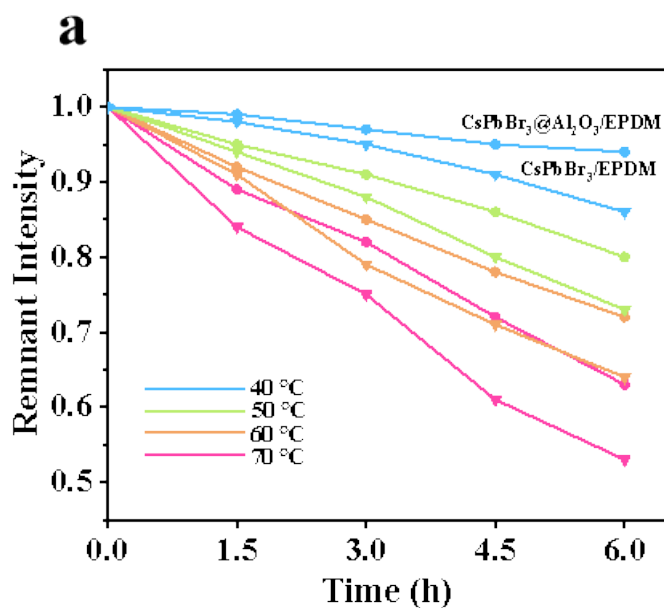
Fig. S7. Comparison between CsPbBr₃ and CsPbBr₃@Al₂O₃ immersed directly in water.

Table. S1. Calculation of average lifetime of PNCs films with or without C₆H₁₅Al.

sample	A (%)	τ_1 (ns)	B (%)	τ_2 (ns)	τ_{ave} (ns)
CsPbBr ₃ /EPDM	75.82	1.89	24.18	11.69	19.79
CsPbBr ₃ @Al ₂ O ₃ /EPDM (40 μ L triethyl aluminum)	72.21	2.11	27.79	23.72	23.56

Table. S2. Calculation of average lifetime of CsPbBr₃/EPDM and CsPbBr₃@Al₂O₃/EPDM immersed in water.

	sample	A (%)	τ_1 (ns)	B (%)	τ_2 (ns)	τ_{ave} (ns)	λ^2
Day 7	CsPbBr ₃ /EPDM	2.61	11.54	8.35	0.71	0.29	0.99
	CsPbBr ₃ @Al ₂ O ₃ /EPDM	3.61	16.26	11.04	0.76	0.24	0.99
Day 15	CsPbBr ₃ /EPDM	2.49	10.41	7.74	0.68	0.32	0.99
	CsPbBr ₃ @Al ₂ O ₃ /EPDM	3.24	12.54	9.61	0.64	0.36	0.99

**Fig. S8.** Comparison of attenuation trend of fluorescence intensity of CsPbBr₃@Al₂O₃/EPDM and CsPbBr₃/EPDM at different heating temperatures.

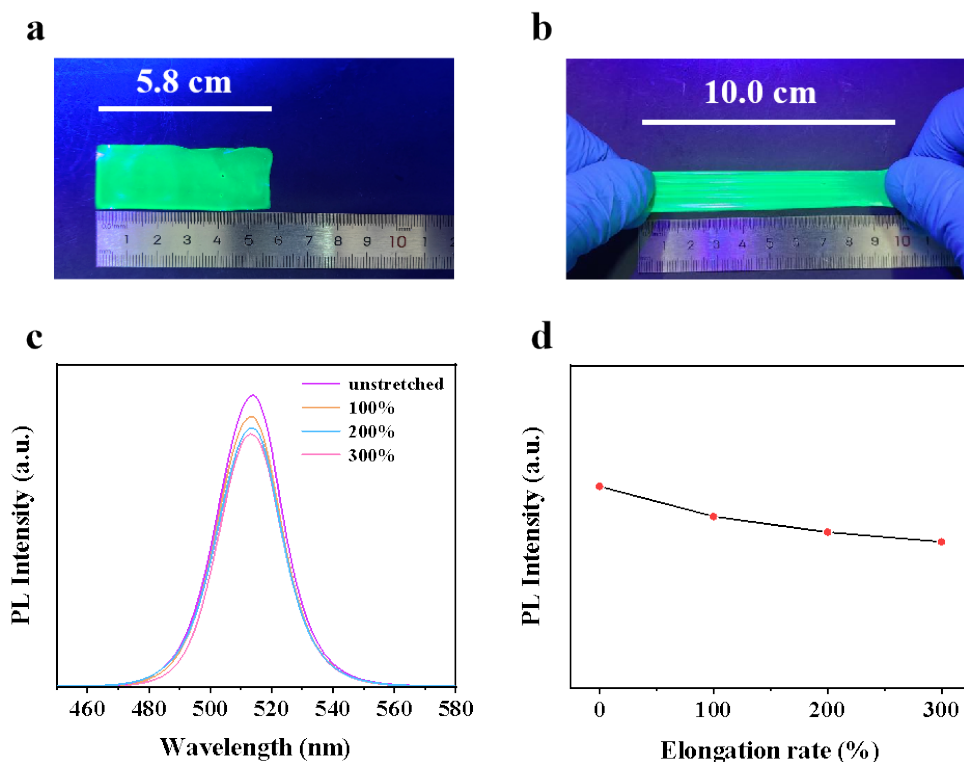


Fig. S9. (a) and (b) are pictures of CsPbBr₃@Al₂O₃/EPDM before and after stretching. (c) Fluorescence spectra of CsPbBr₃@Al₂O₃/EPDM at different tensile rates. (d) Line chart of the fluorescence intensity of CsPbBr₃@Al₂O₃/EPDM with the change of the tensile rate.

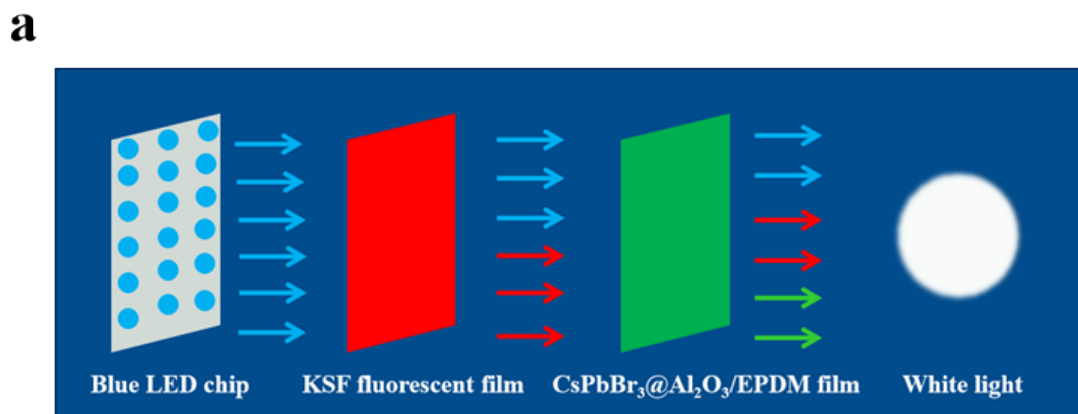


Fig. S10. (a) schematic diagram of white LED.

Table. S3. Color rendering index (CRI), correlated color temperature (CCT), color gamut and color coordinates of QDs LED

sample	CRI	CCT/K	CIE(x,y)	Color Gamut(NTSC)	Color Gamut(Rec.2020)
CsPbBr ₃ @Al ₂ O ₃ /EPDM	57	5606	(0.33,0.34)	129%	95%