

Supporting Information

Ampholytic interface induced in-situ growth of CsPbBr₃ for high efficient perovskite light-emitting diodes

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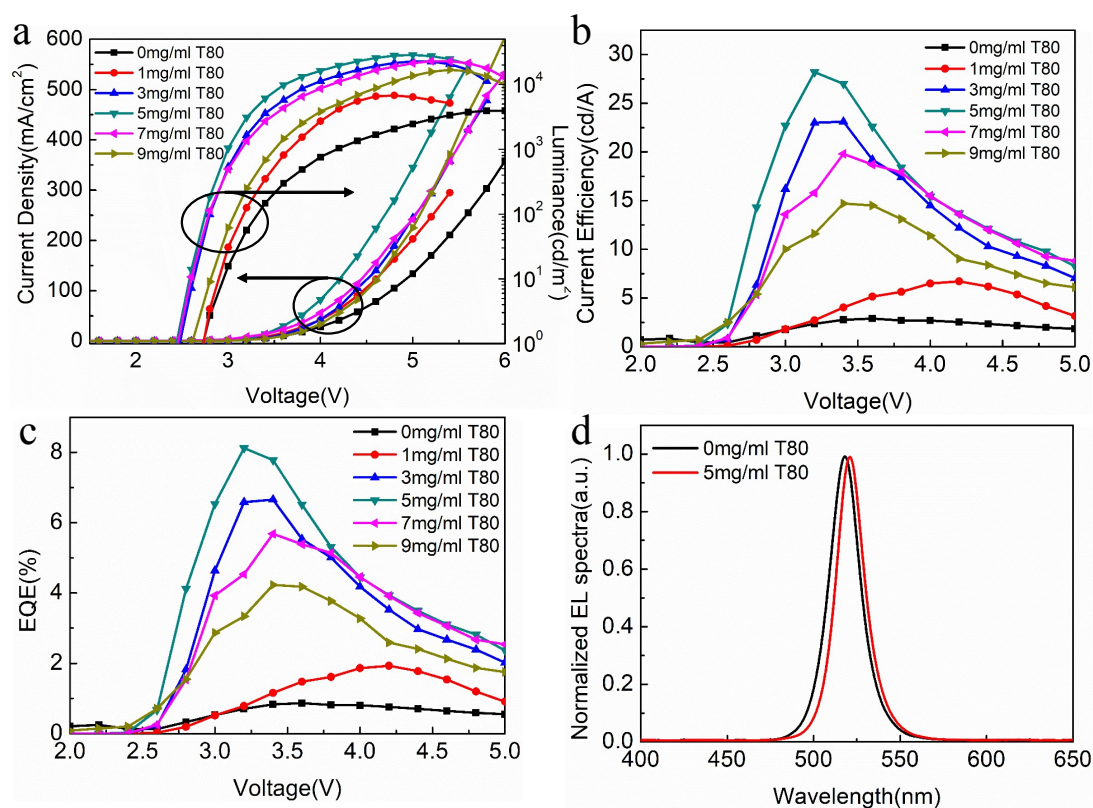


Figure S1.(a) Current density-voltage-luminance (J-V-L), (b) Current efficiency-voltage (CE-V) and (c) EQE-V curves for the PeLEDs. (d) EL spectra of various devices working at 4.0 V .

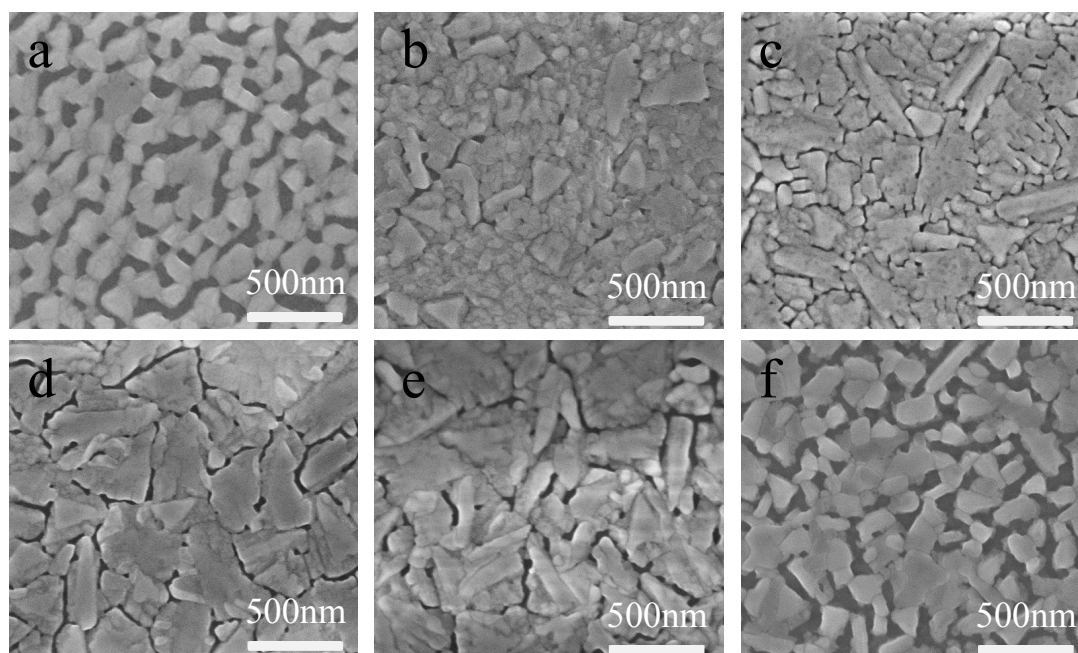


Figure S2.SEM images of perovskite films with various weight ratios Tween 80: (a) 0mg/ml, (b) 1mg/ml, (c) 3mg/ml, (d) 5mg/ml, (e) 7mg/ml and (f) 9mg/ml.

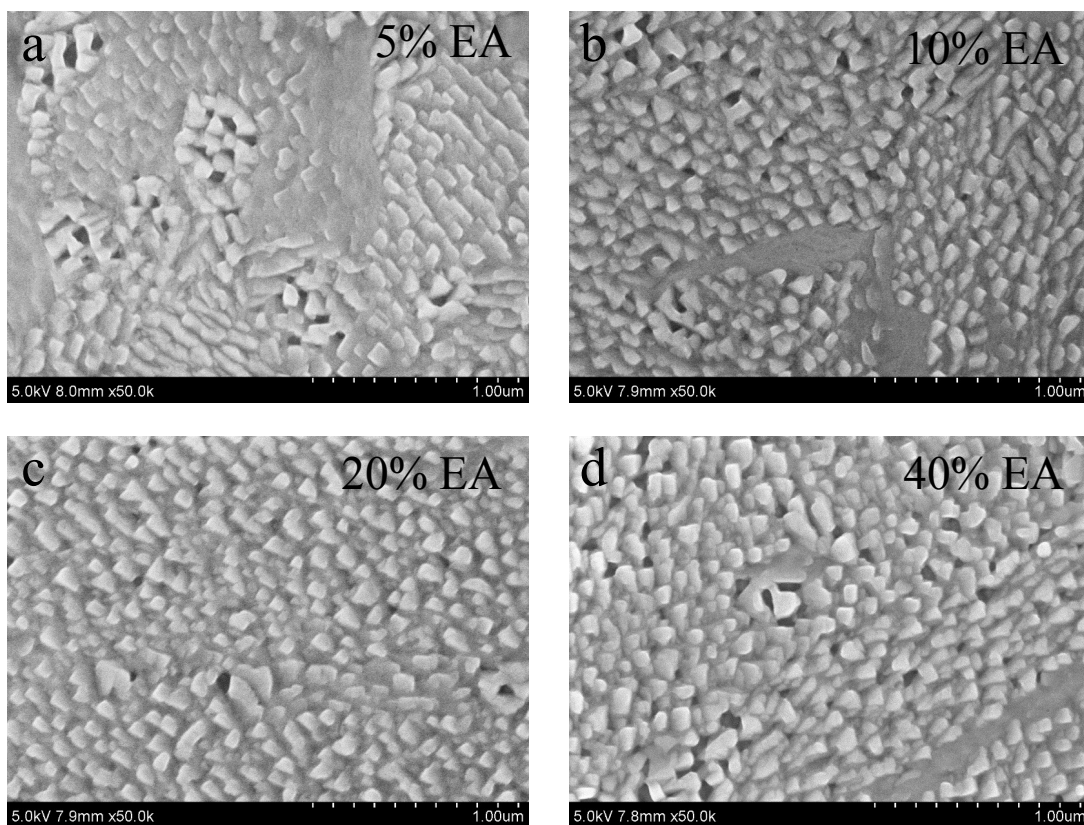


Figure S3. SEM images of CsPbBr₃ perovskite films obtained on different EA interface layers: (a) 5%, (b) 10%, (c) 20%, and (d) 40%.

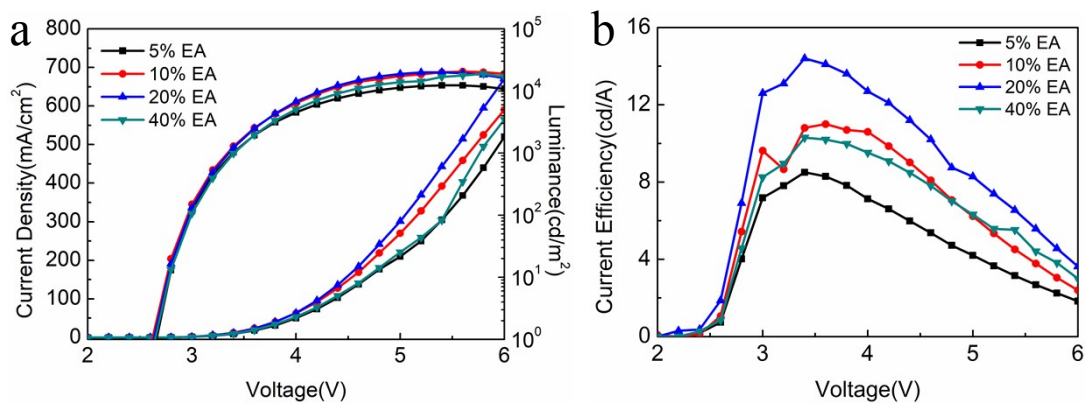


Figure S4. (a) Current density-voltage-luminance (J-V-L), (b) Current efficiency-voltage (CE-V) for the PeLEDs.

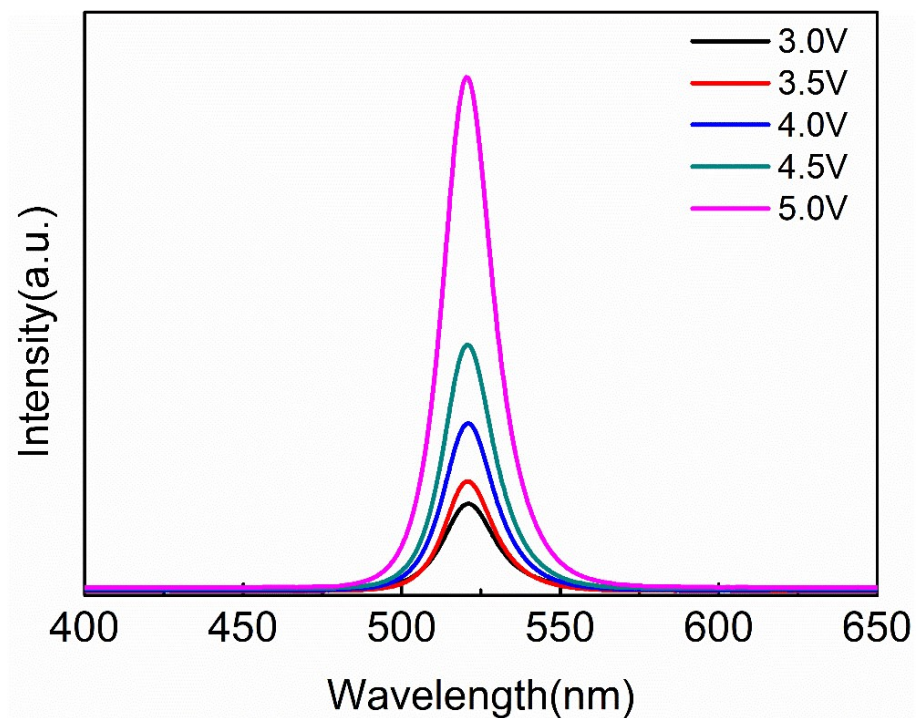


Figure S5. EL spectra of the PeLED based on 5mg/ml Tween 80 in perovskite precursor solution film at various bias.

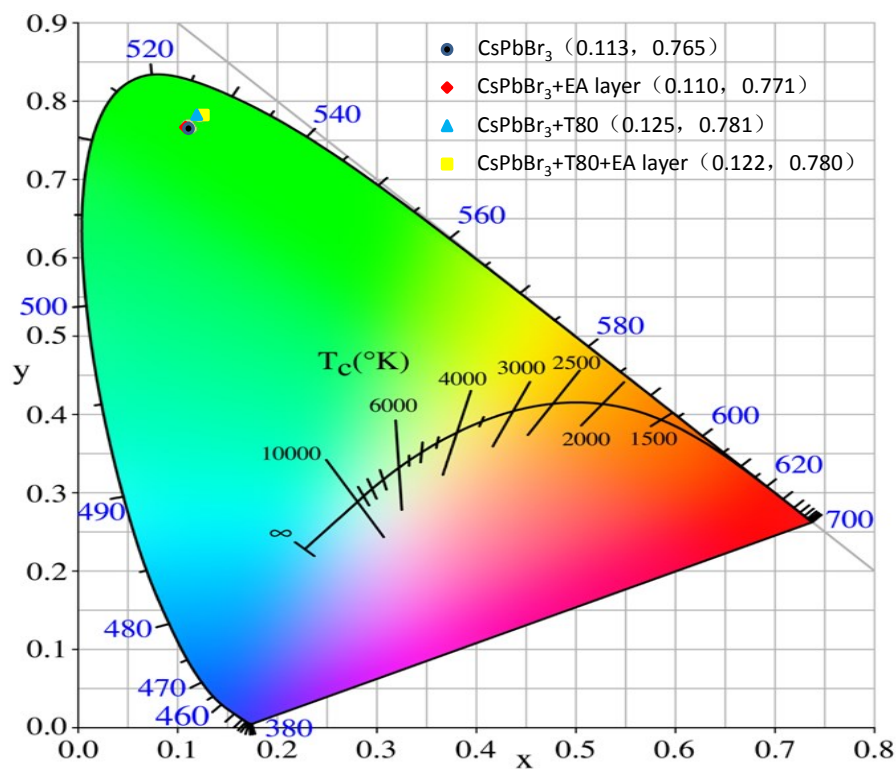


Figure S6. The commission international de l'Eclairage (CIE) coordinates at 4.0 V.

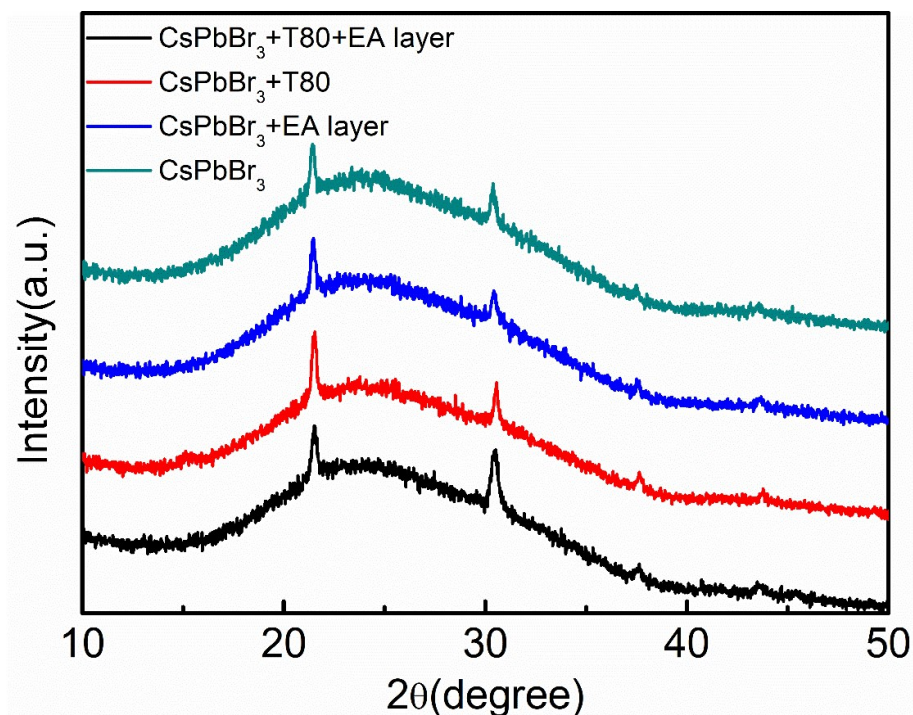


Figure S7. XRD patterns of various perovskite films.

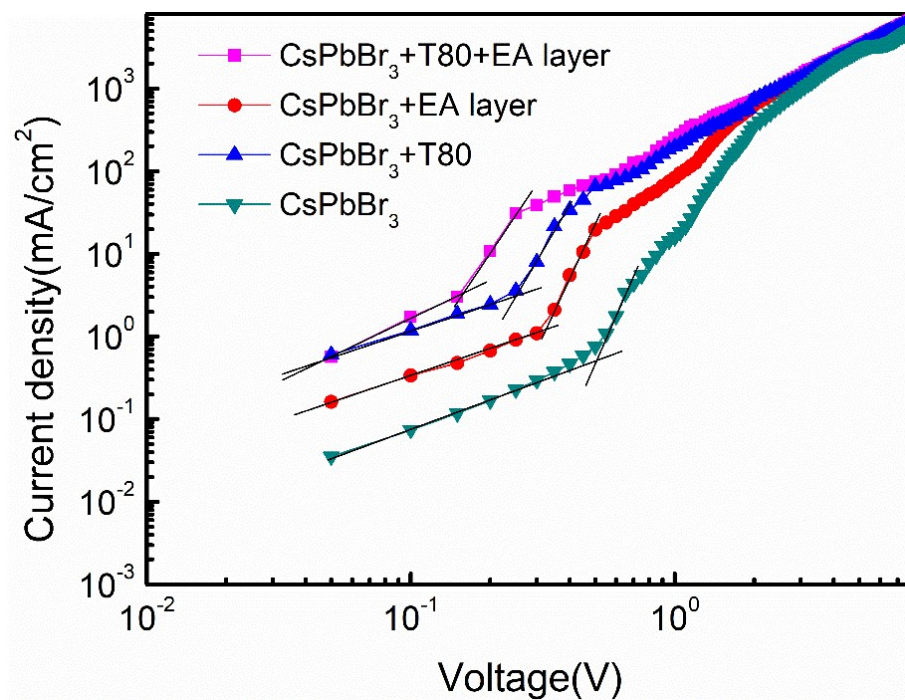


Figure S8. Current density–voltage curves for hole-only devices based on the perovskite films under different conditions.

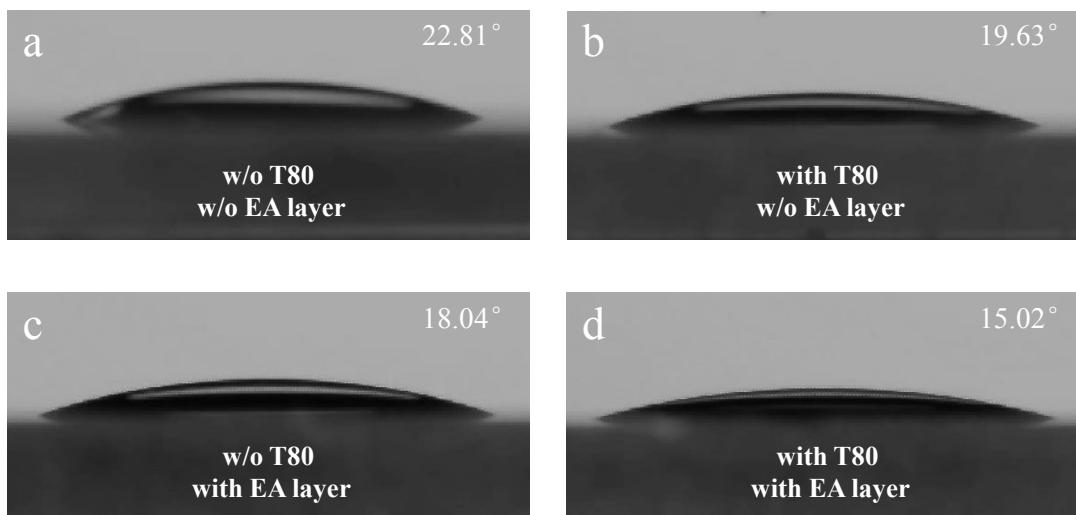


Figure S9. Contact angles for different perovskite precursors on PEDOT:PSS substrates (a)、(b) and EA interface layer substrates (c)、(d).

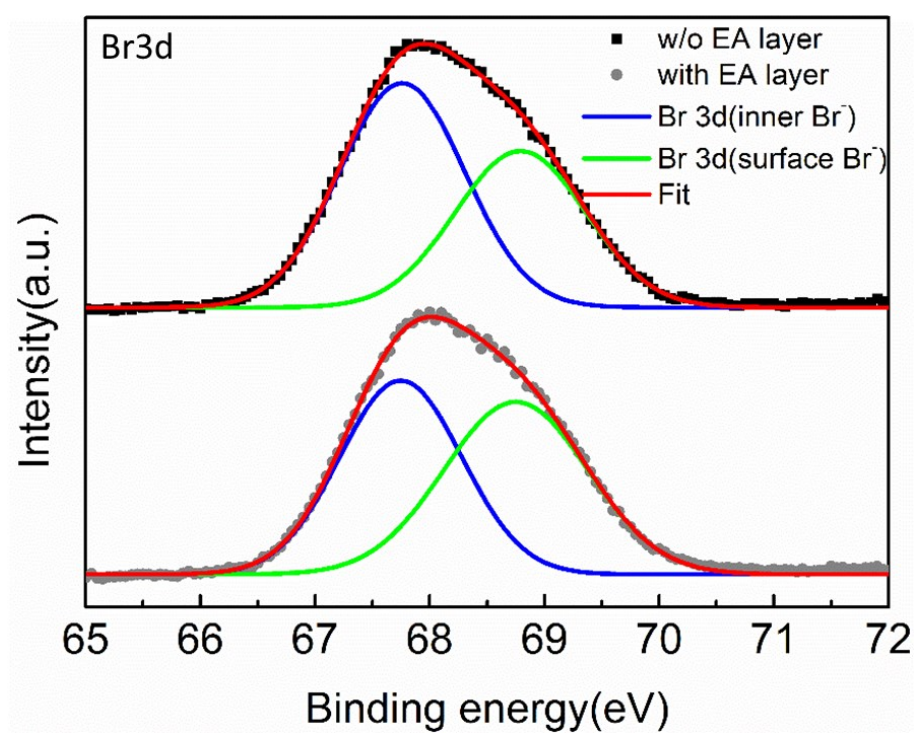


Figure S10. XPS high resolution spectra of Br 3d .

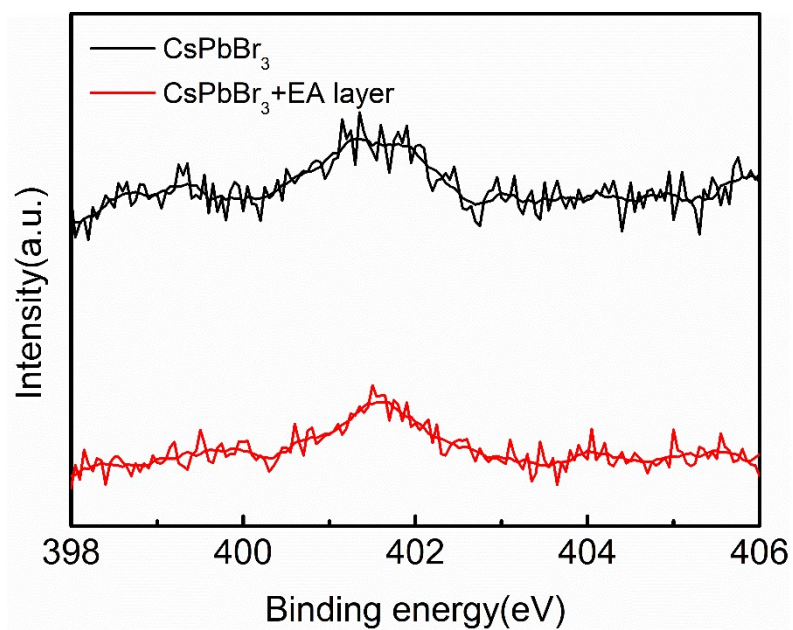


Figure S11. XPS spectra of N1s for PEDOT:PSS/CsPbBr₃ and PEDOT:PSS/EA/CsPbBr₃.

Table S1. PL lifetime of Perovskite films under different conditions

EA (with/without)	T80 (mg/ml)	A ₁	τ ₁ (ns)	A ₂	τ ₂ (ns)	A ₃	τ ₃ (ns)	τ _{avg} (ns)
without	0	0.60	0.84	0.33	3.96	0.07	43.48	4.89
with	0	0.39	1.12	0.42	7.54	0.19	49.34	12.97
without	5	0.26	1.37	0.39	8.38	0.35	76.14	30.27
with	5	0.18	0.83	0.27	9.49	0.55	84.06	48.94

Table S2. Trap density of Perovskite films under different conditions

EA (with/without)	T80 (mg/ml)	L(nm)	V _{TEL} (V)	n _t (cm ⁻³)
Without	0	48.5	0.51	3.95×10^{17}
With	0	49.7	0.33	2.43×10^{17}
without	5	53.9	0.25	1.56×10^{17}
with	5	52.5	0.16	1.05×10^{17}