

Supporting Information

Enhanced Stability and Performance of Light-Emitting Diodes Based on *in Situ* Fabricated FAPbBr₃ Nanocrystals via Ligand Compensation with *n*-Octylphosphonic Acid

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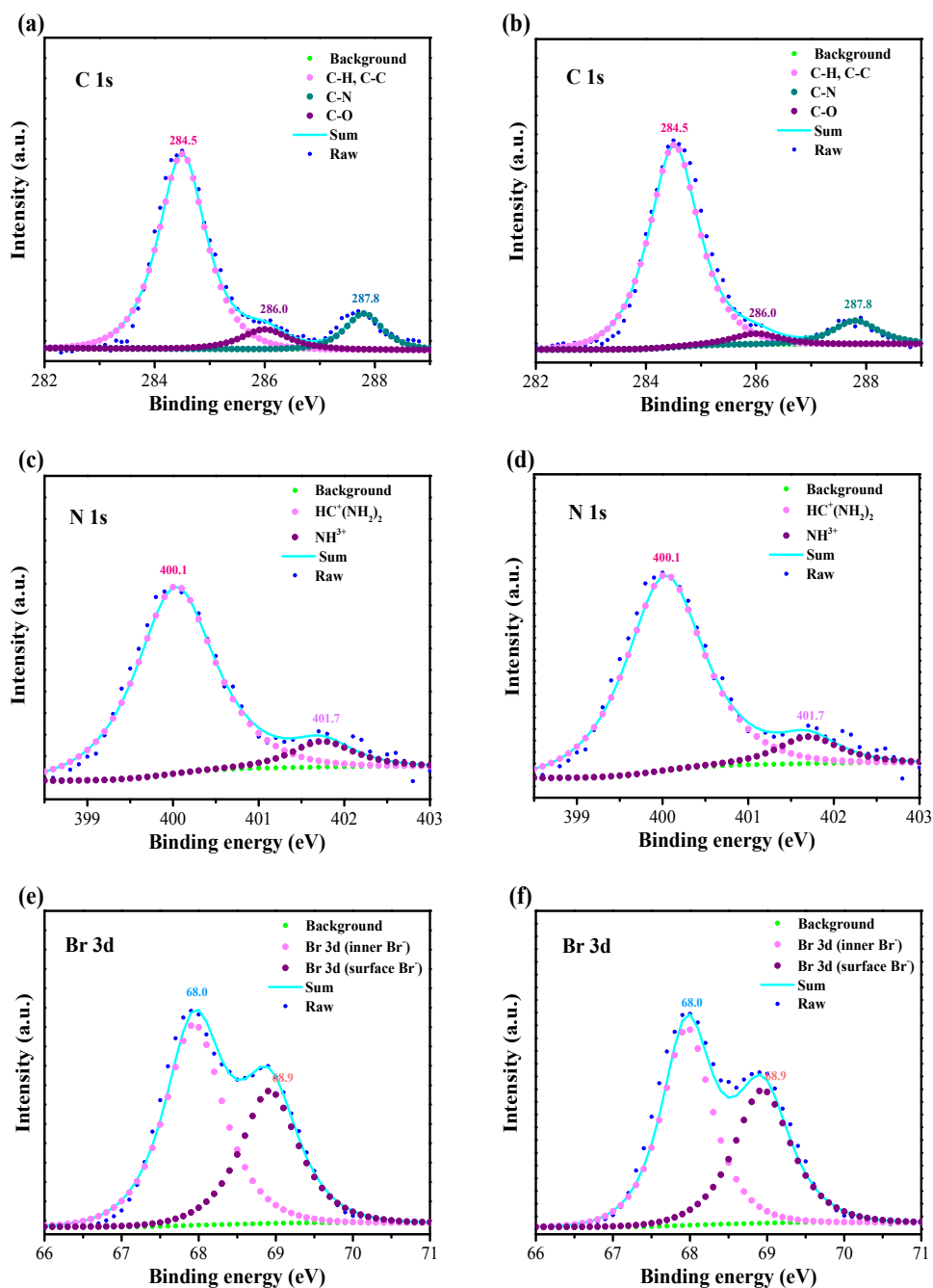


Fig. S1 (a, b) C 1s XPS spectra, (c, d) N 1s XPS spectra, and (e, f) Br 3d XPS spectra of pristine and OPA (2 mg/mL) added FAPbBr₃ PNCs films.

Table. S1 The fluorescence intensity of the modified PNCs films with different concentrations of OPA recorded at every six hours.

OPA (mg/mL)	0 h	6 h	12 h	18 h
0	100%	57.0%	41.4%	15.6%
1	100%	64.2%	53.6%	35.8%
2	100%	82.3%	71.9%	65.0%
3	100%	76.8%	65.4%	54.7%

Table. S2 Relevant parameters extracted from the TRPL curves of all perovskite PNCs films with various concentrations of OPA.

OPA (mg/mL)	τ_1 (ns)	A_1 (%)	τ_2 (ns)	A_2 (%)	χ^2	τ_{avg} (ns)
0	19.32 ± 0.32	51.26%	66.79 ± 0.15	48.74%	1.166	42.46 ± 0.10
1	25.88 ± 0.16	49.84%	71.21 ± 0.12	50.16%	1.108	48.61 ± 0.23
2	24.91 ± 0.13	40.18%	102.74 ± 0.11	59.82%	1.022	71.46 ± 0.19
3	28.43 ± 0.15	43.21%	91.54 ± 0.16	56.79%	1.031	64.27 ± 0.11

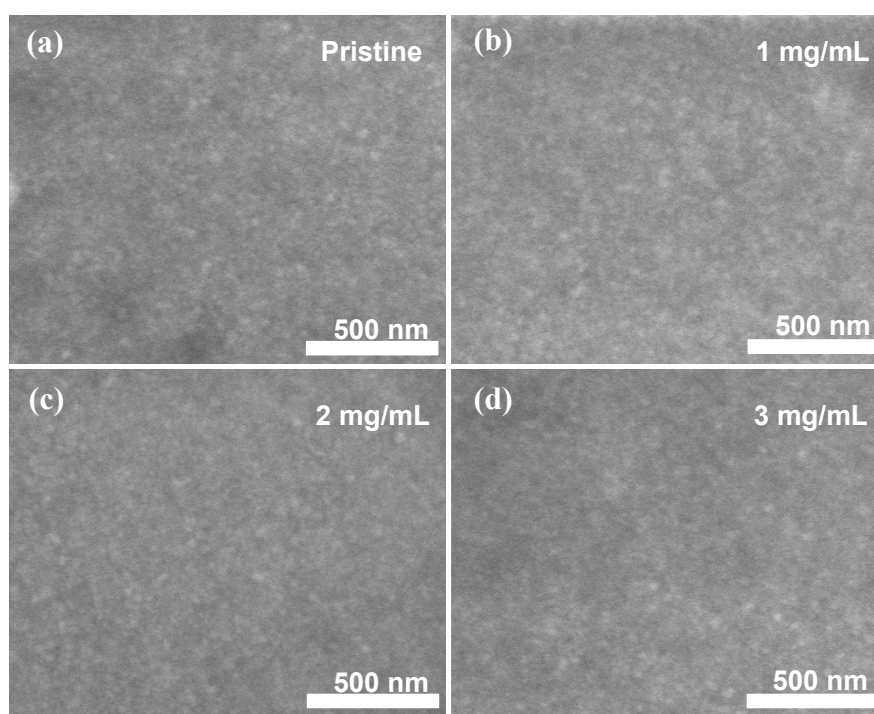


Fig. S2 SEM images of OPA-FAPbBr₃ PNCs films with (a) 0 mg/mL, (b) 1 mg/mL, (c) 2 mg/mL, and (d) 3 mg/mL concentrations of OPA. (Scale bar: 500 nm).

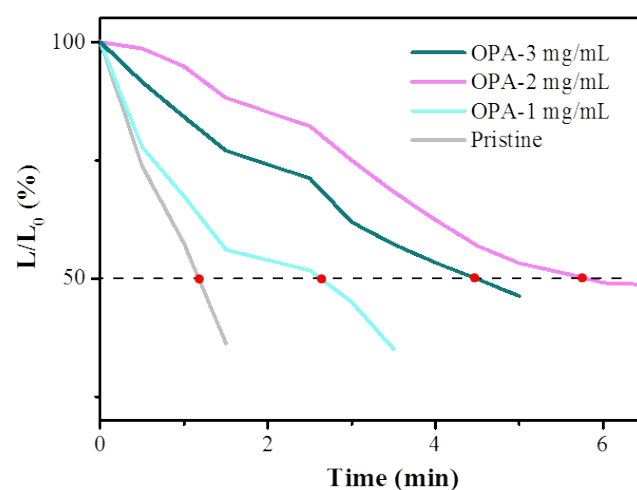


Fig. S3 Operation stability of PeLEDs with various concentrations of OPA.

Table. S3 Summarization of the reported representative PeLEDs' lifetimes. T_{50} is defined as the degradation time corresponding to 50% of the initial luminance, respectively.

	Emission layer	Device Structure	Publication year	Lifetime	Ref
Organic-inorganic hybrid PeLEDs	FAPbBr ₃ NCs	ITO/PEDOT:PSS/FAPbBr ₃ /TPBi/LiF/Al	This work	5.5 min	-
	MAPbBr ₃ NPs	ITO/PEDOT:PSS/perovskite/TPBi/TPBi:Cs ₂ CO ₃ /Al	2016	0.5 min	1
	MAPbBr ₃	ITO/PEDOT:PSS/MHP/TPBi/LiF/Al	2017	1.6 min	2
	MAPbBr ₃ /BABr quasi-core/shell NCs	ITO/PVK/perovskite/TPBi/LiF/Al	2017	1.5 min	3
	MAPbBr ₃ NCs	ITO/PEDOT:PSS/perovskite/B3PYMPM:TPBi/B3PYMPM:Cs ₂ CO ₃ /Al	2017	6 min	4
	FA _{0.8} Cs _{0.2} PbBr ₃ NPs	ITO/PEDOT:PSS/TFB/MHP/TPBi/LiF/Al	2017	1.6 min	5
	FAPbBr ₃ NCs	ITO/PEDOT:PSS/TFB/FAPbBr ₃ /TPBi/LiF/Al	2018	0.5 min	6
	MAPbBr ₃ QDs	ITO/PEDOT:PSS/PVK/perovskite/TPBi/LiF/Al	2019	7 min	7
All-inorganic PeLEDs	CsPbBr ₃ NPs	ITO/NiO/MHP/ZnO/Al	2017	1.75 h	8
	CsPbBr ₃ :PEO	ITO/PEDOT:PSS/MHP/TPBi/LiF/Al	2017	80 h	9
	CsPbBr ₃ QDs	ITO/PEDOT:PSS/Poly-TPD/MHP/TPBi/LiF/Al	2018	3 h	10
	CsPbBr ₃	ITO/PEDOT:PSS/MHP/TPBi/LiF/Al	2019	250 h	11

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