

Supplementary Materials

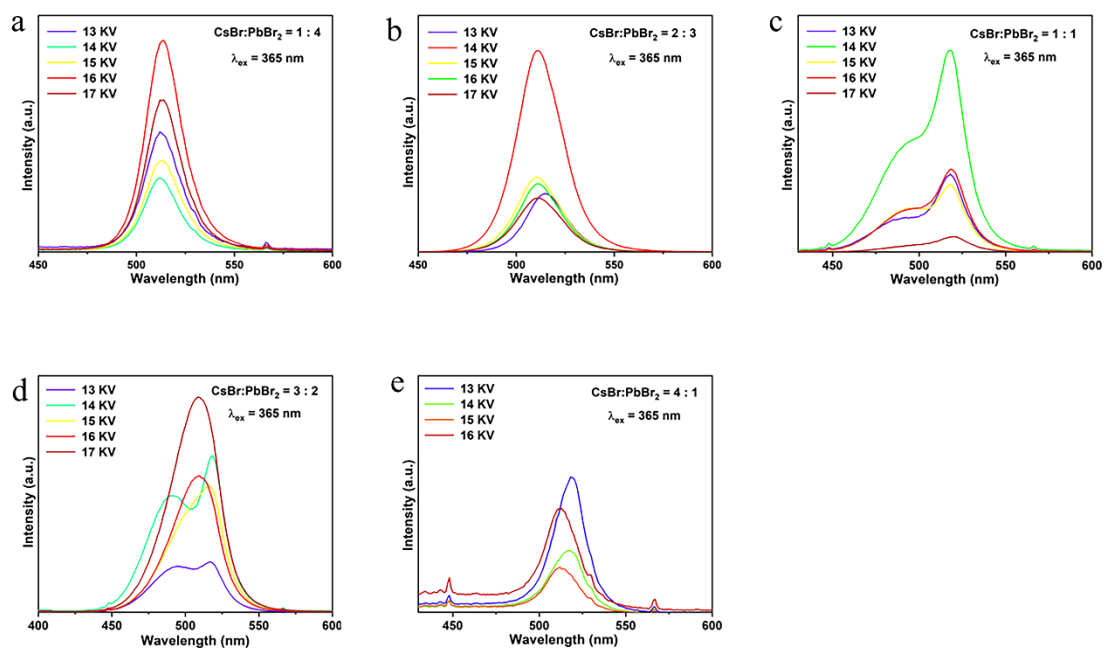


Figure S1. (a-e) PL spectra of CsPbBr₃/PAN composite nanofibers under different voltages and different ratios of CsBr and PbBr₂.

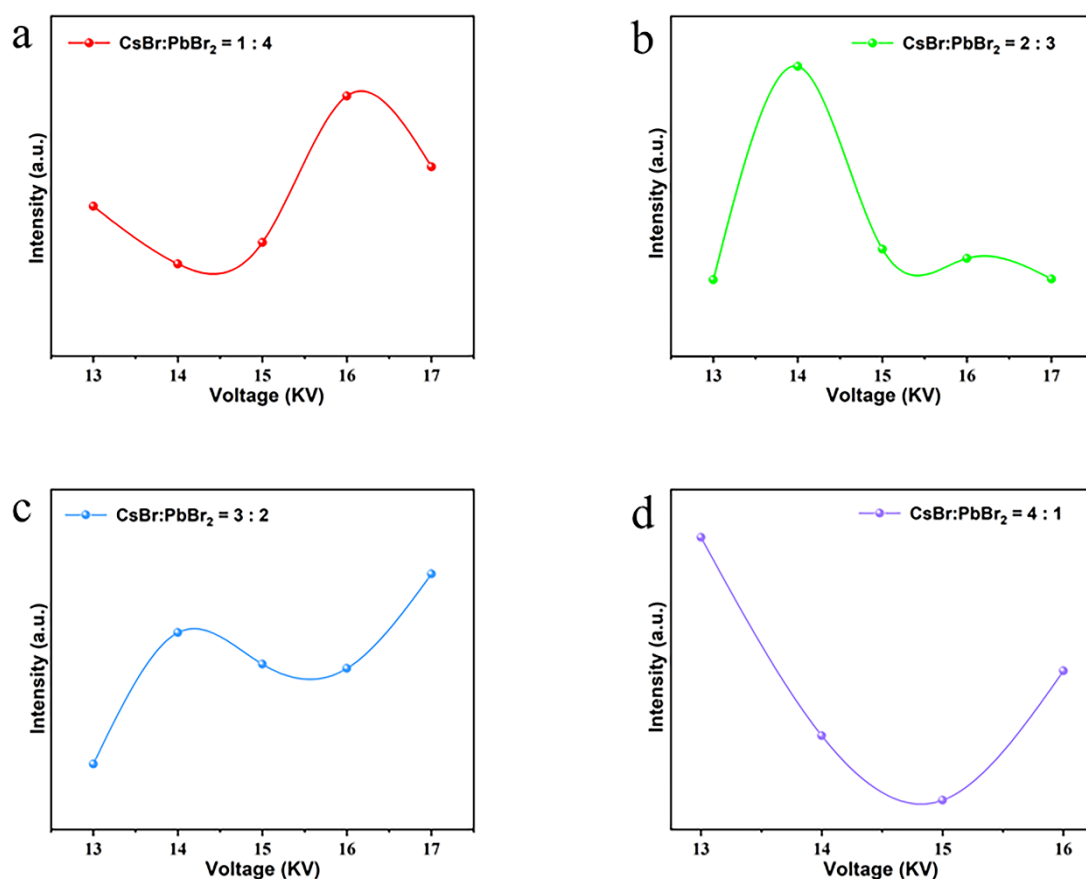


Figure S2. (a-d) PL Intensity trend change chart of CsPbBr₃/PAN composite nanofibers under different voltages and different ratios of CsBr and PbBr₂.

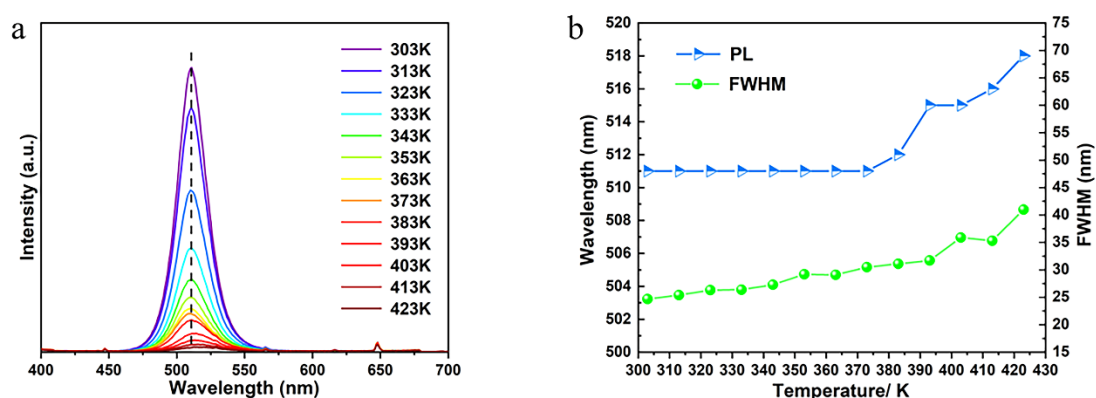


Figure S3. (a) Temperature-varying PL spectra of CsPbBr₃/PAN composite film. (b) PL peak positions and FWHM.

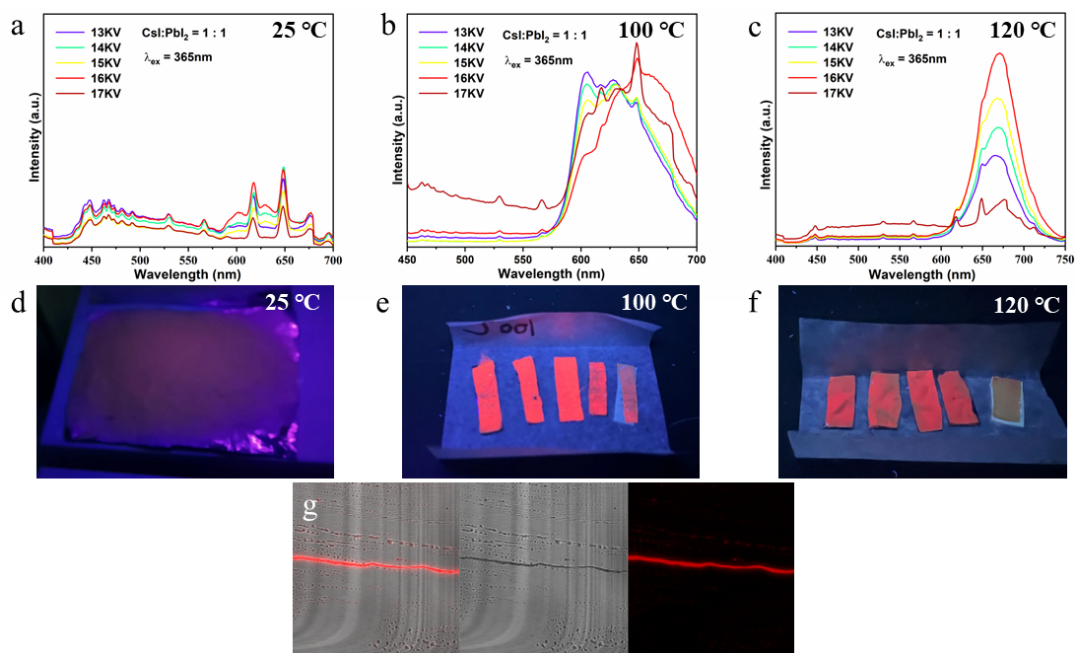


Figure S4. (a-c) PL spectra of CsPbI₃/PAN composite nanofibers under different voltages and various thermal treatment temperatures. (d-f) Photos of CsPbI₃/PAN composite film under different voltages and various thermal treatment temperatures. (g) LSCM.

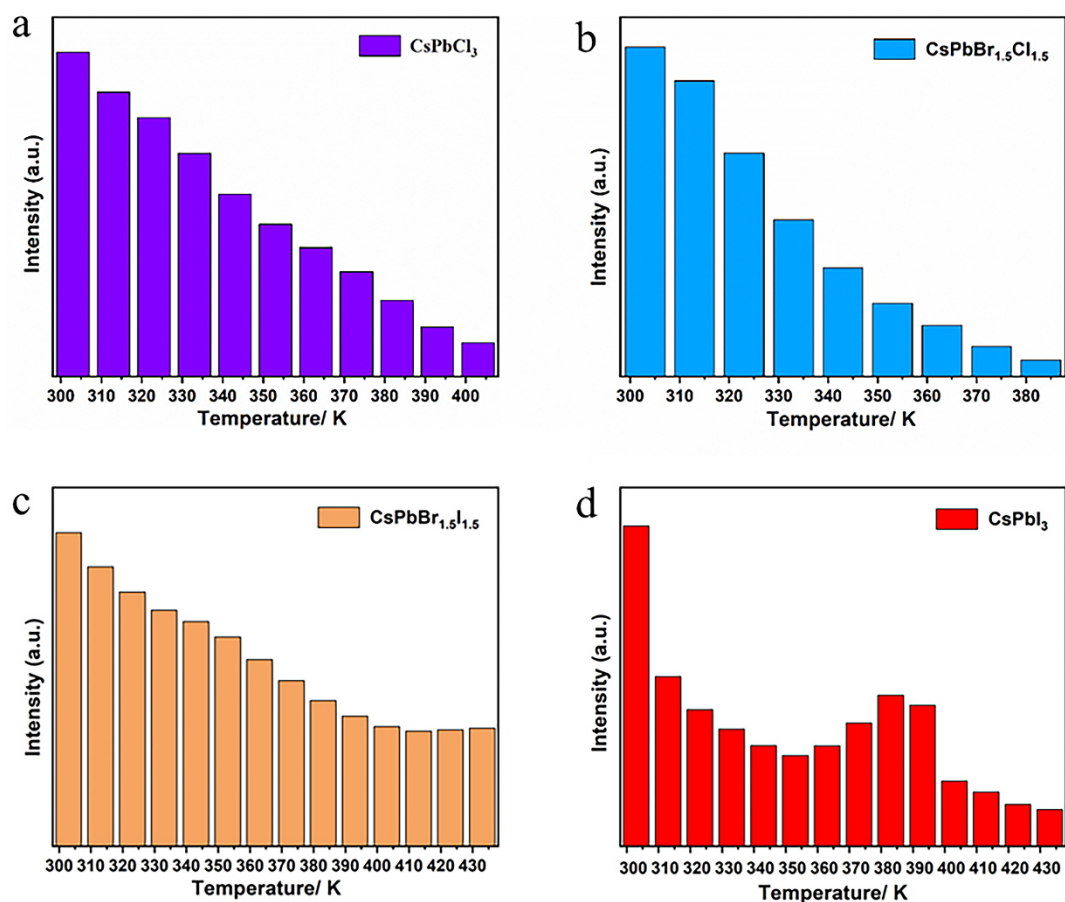


Figure S5. Thermal stability of CsPbX₃/PAN composite nanofibers: (a) CsPbCl₃/PAN, (b) CsPbBr_{1.5}Cl_{1.5}/PAN, (c) CsPbBr_{1.5}I_{1.5}/PAN, (d) CsPbI₃/PAN.

Table S1. Fluorescence lifetime of multicolor CsPbX₃/PAN composite nanofibers.

CsPbBr _x Cl _{3-x}	Lifetime (ns)	CsPbBr _x I _{3-x}	Lifetime (ns)
CsPbBr _{0.6} Cl _{2.4}	1.175 ns	CsPbBr _{2.4} I _{0.6}	2.428 ns
CsPbBr _{1.2} Cl _{1.8}	2.113 ns	CsPbBr _{1.8} I _{1.2}	6.516 ns
CsPbBr _{1.5} Cl _{1.5}	2.369 ns	CsPbBr _{1.5} I _{1.5}	5.450 ns
CsPbBr _{1.8} Cl _{1.2}	6.723 ns	CsPbBr _{1.2} I _{1.8}	5.999 ns
CsPbBr _{2.4} Cl _{0.6}	5.452 ns	CsPbBr _{0.6} I _{2.4}	4.684 ns

Table S2. CIE coordinates of multicolor CsPbX₃/PAN composite nanofibers.

Samples	CIE Coordinates	Samples	CIE Coordinates
CsPbCl ₃	(0.205, 0.171)	CsPbBr _{2.4} I _{0.6}	(0.207, 0.670)
CsPbBr _{0.6} Cl _{2.4}	(0.205, 0.131)	CsPbBr _{1.8} I _{1.2}	(0.278, 0.671)
CsPbBr _{1.2} Cl _{1.8}	(0.198, 0.104)	CsPbBr _{1.5} I _{1.5}	(0.283, 0.610)
CsPbBr _{1.5} Cl _{1.5}	(0.176, 0.067)	CsPbBr _{1.2} I _{1.8}	(0.368, 0.526)
CsPbBr _{1.8} Cl _{1.2}	(0.138, 0.082)	CsPbBr _{0.6} I _{2.4}	(0.537, 0.349)
CsPbBr _{2.4} Cl _{0.6}	(0.107, 0.526)	CsPbI ₃	(0.520, 0.326)
CsPbBr ₃	(0.086, 0.693)		

Table S3. List of water stability tests.

Materials	Duration of the test	The maintenance of	Ref.
	(Day)	PL intensity (%)	
CsPbX ₃ -EP	10	85	1
CsPbBr ₃ @APTES@BPSQ	7	82	2
MAPbBr ₃ -3 fibrous mat	2	50	3
CsPbBr ₃ @PVDF-HFP/PS	70	90	4
CsPbBr ₃ /PAN	111	93.5	This work

Reference

1. S. Wei, H. Zhu, J. Zhang, L. Wang, M. An, Y. Wang, X. Zhang, Y. Liu, Luminescent perovskite nanocrystal-epoxy resin composite with high stability against water and air, *J. Alloys Compd.* 789 (2019) 209-214.
2. C. Ma, M. Zhang, J. Zhang, J. Liao, H. Sun, D. Ji, R. Pang, H. Zhang, J. Liu, S. Liu, Highly Luminescent and Stable Perovskite Quantum Dots Films for Light-Emitting Devices and Information Encryption, *Adv. Funct. Mater.* 23 (2024) 16717.
3. P.C. Tsai, J.Y. Chen, E. Ercan, C.C. Chueh, S.H. Tung, W.C. Chen, Uniform Luminous Perovskite Nanofibers with Color-Tunability and Improved Stability Prepared by One-Step Core/Shell Electrospinning, *Small* 14 (2018) 1704379.
4. X. Hu, Y. Xu, J. Wang, J. Ma, L. Wang, W. Jiang, In Situ Fabrication of Superfine Perovskite Composite Nanofibers with Ultrahigh Stability by One-Step Electrospinning Toward White Light-Emitting Diode, *Advanced Fiber Materials* 5 (2022) 183-197.