

Electronic Supplementary Information

Two-step *in situ* synthesis of CsPbX₃@TS-1 zeolites (X = Cl, Br, I) nanocomposites for optical thermometric, latent fingerprints and anti-counterfeiting applications

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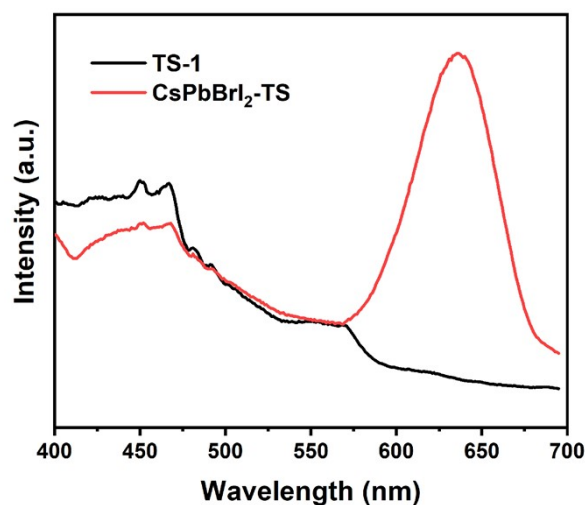


Fig. S1 Photoluminescent emission spectra of TS-1 and CsPbBr₂-TS composite.

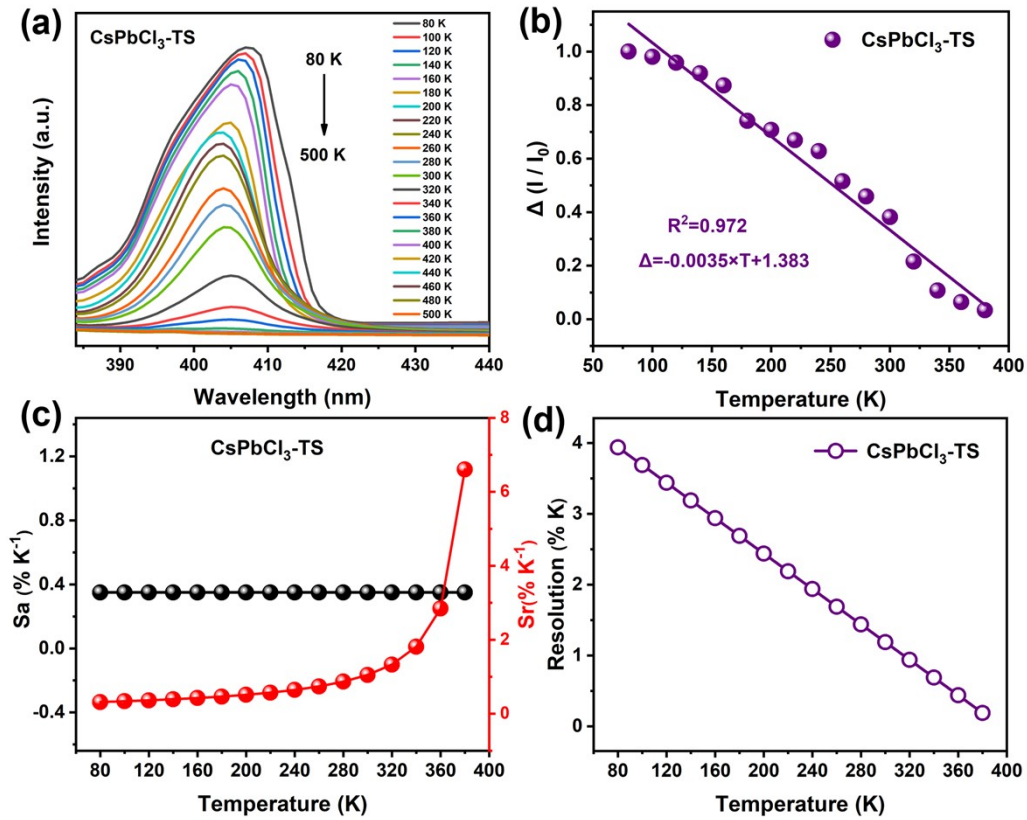


Fig. S2 PL emission spectra of (a) CsPbCl₃-TS at different temperatures range from 80 to 500 K; (b) PL intensity ratio of I/I_0 as a function of temperature; (c) Absolute sensitivity (S_a) and relative sensitivities (S_r) at different temperatures; (d) Corresponding temperature resolution of CsPbCl₃-TS versus temperatures.

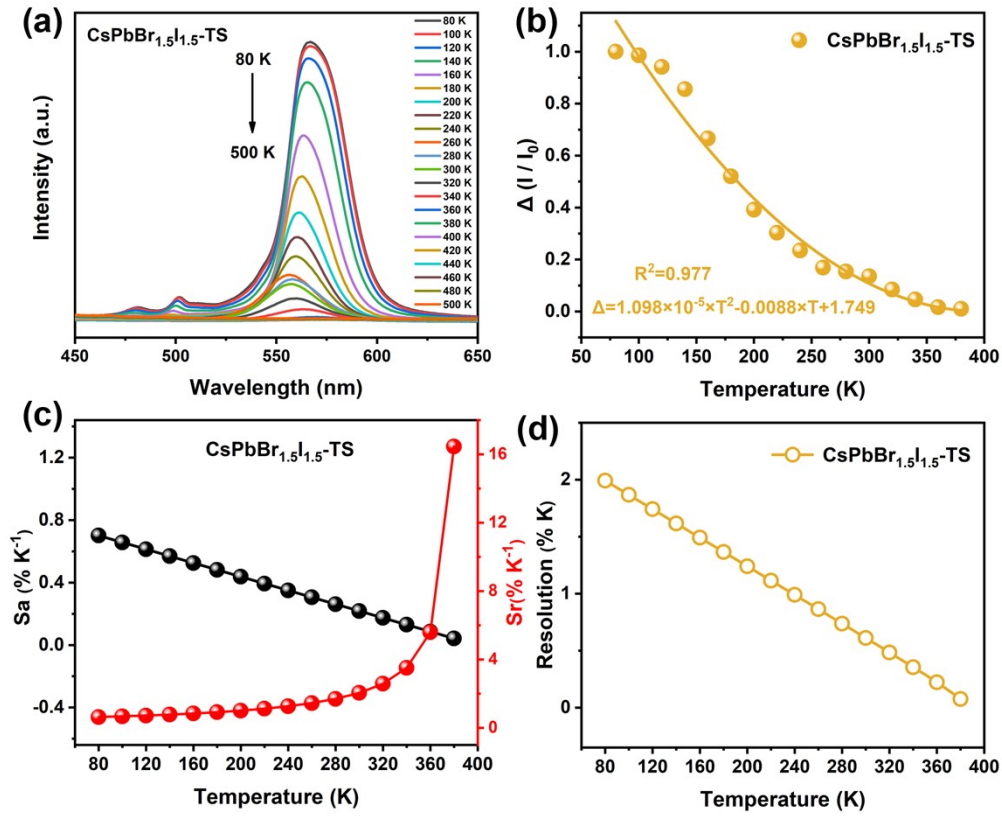


Fig. S3 PL emission spectra of (a) CsPbBr_{1.5}I_{1.5}-TS at different temperatures range from 80 to 500 K; (b) PL intensity ratio of I/I_0 as a function of temperature; (c) Absolute sensitivity (S_a) and relative sensitivities (S_r) at different temperatures; (d) Corresponding temperature resolution of CsPbBr_{1.5}I_{1.5}-TS versus temperatures.

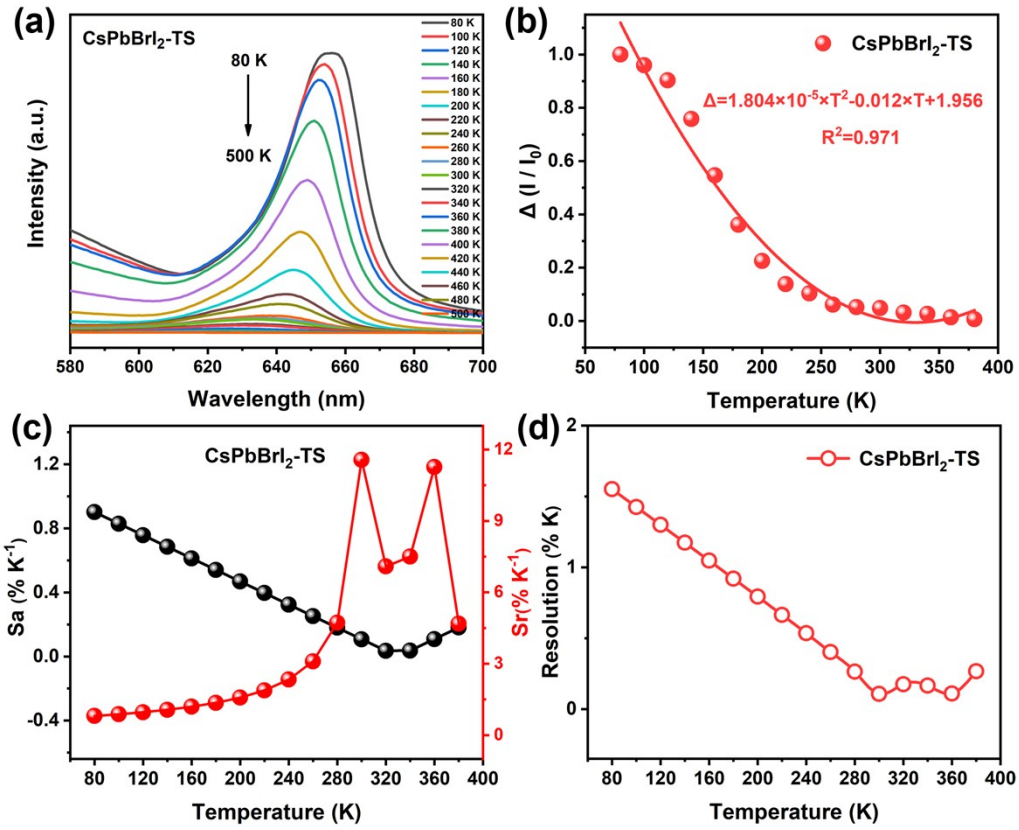


Fig. S4 PL emission spectra of (a) CsPbBr₂-TS at different temperatures range from 80 to 500 K; (b) PL intensity ratio of I/I_0 as a function of temperature; (c) Absolute sensitivity (S_a) and relative sensitivities (S_r) at different temperatures; (d) Corresponding temperature resolution of CsPbBr₂-TS versus temperatures.

Table S1 Comparison of the absolute sensitivity (S_a), relative sensitivity (S_r), and temperature resolution (δT) of the CsPbX₃-TS (X = Cl, Br, I) nanocomposites in optical temperature sensing.

Materials	Temperature range (K)	S_a (maximum) (K ⁻¹)	S_r (maximum) (K ⁻¹)	δT (K)
CsPbCl ₃ -TS	80-380	0.35% (at 80 K)	6.61% (at 380 K)	0.039
CsPbCl _{1.5} Br _{1.5} -TS	80-380	0.34% (at 80 K)	7.32% (at 380 K)	0.039
CsPbBr ₃ -TS	80-380	1.73% (at 80 K)	7.14% (at 380 K)	0.012
CsPbBr _{1.5} I _{1.5} -TS	80-380	0.70% (at 80 K)	16.46% (at 380 K)	0.020
CsPbBr ₂ -TS	80-380	0.90% (at 80 K)	11.57% (at 300 K)	0.016