Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

High Fluorescence Efficiency of Intrinsic Ligand-Free Zero-Dimensional Cs_4PbBr_6 Particles and Microcrystals

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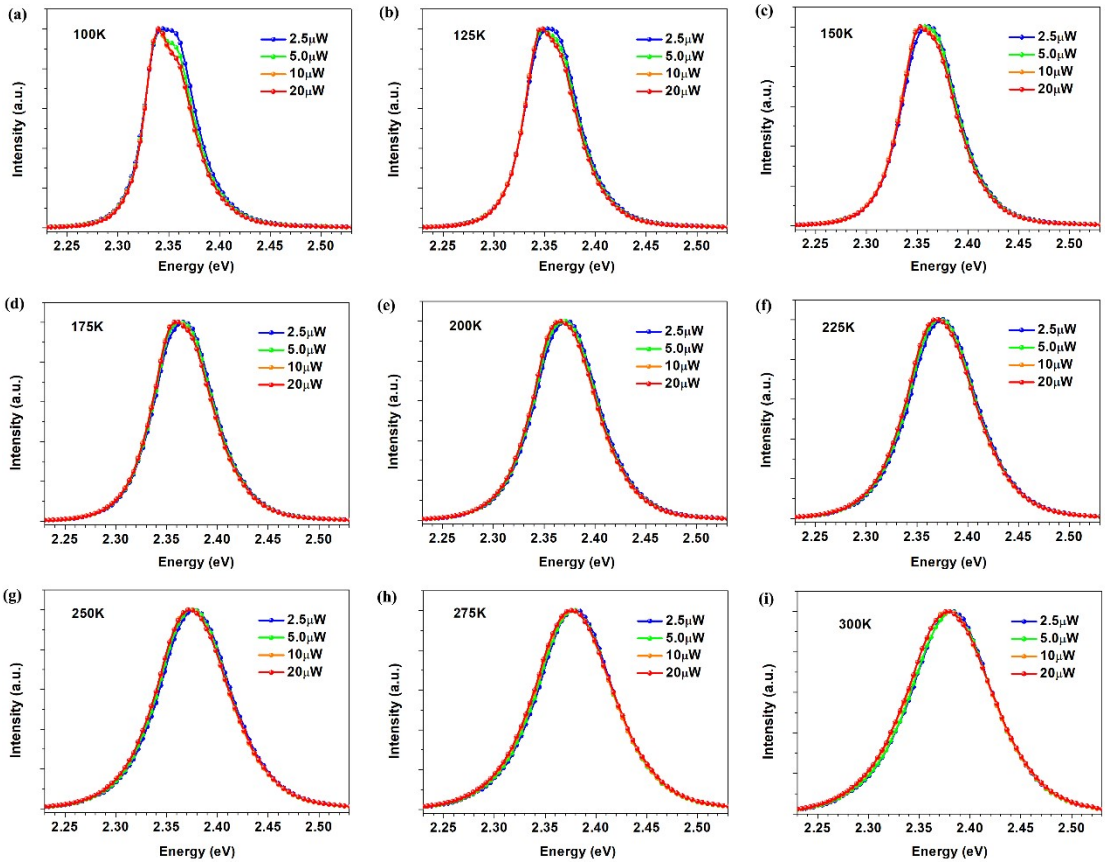


Figure S1. PL spectra of Cs_4PbBr_6 particles measured from 100K to 300K under different excitation intensities at 400 nm

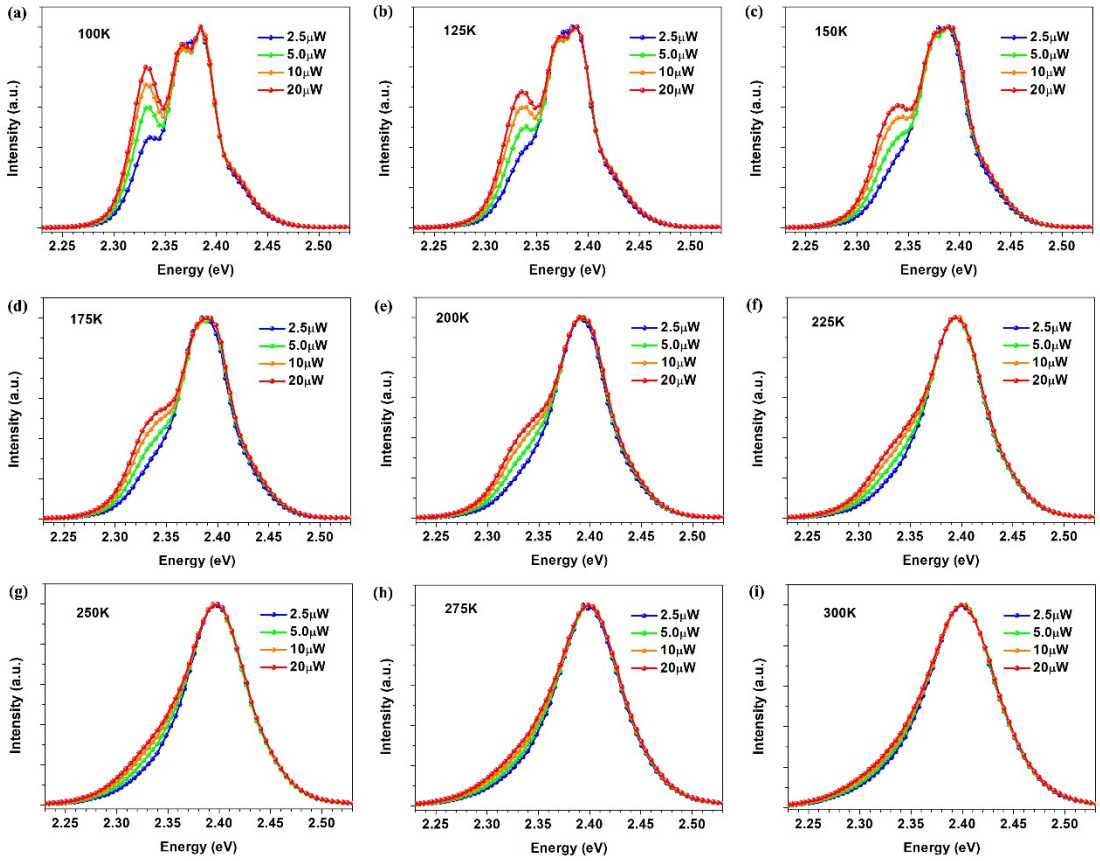


Figure S2. PL spectra of Cs_4PbBr_6 microcrystals measured from 100K to 300K under different excitation intensities at 400 nm.

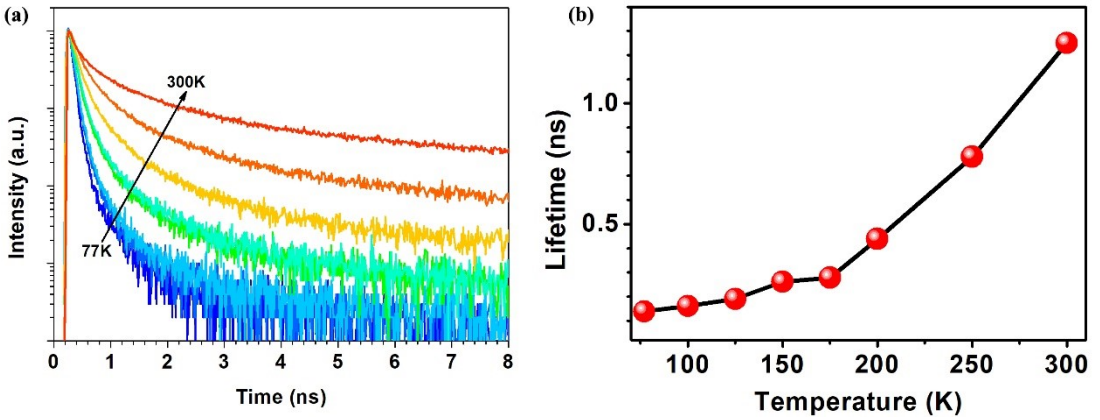


Figure S3. Temperature dependent PL decay profiles (emission wavelength 525 nm) of Cs_4PbBr_6 particles at different temperatures in the 8 ns time window; (b) Intensity-average PL lifetimes of Cs_4PbBr_6 particles at different temperatures.

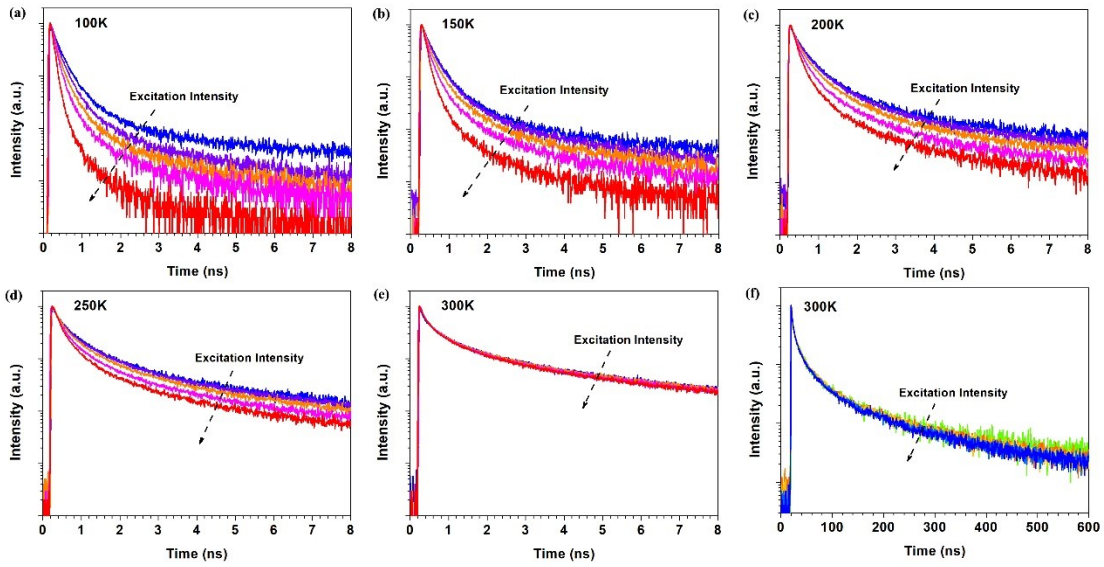


Figure S4. (a-e) Excitation intensity dependent PL decay profiles (emission wavelength 525 nm) of Cs_4PbBr_6 particles at 100K, 150K, 200K, 250K and 300K on a short (8 ns) time window; (f) Excitation intensity dependent PL decay profiles of Cs_4PbBr_6 particles at 300K on a long (600 ns) time window.

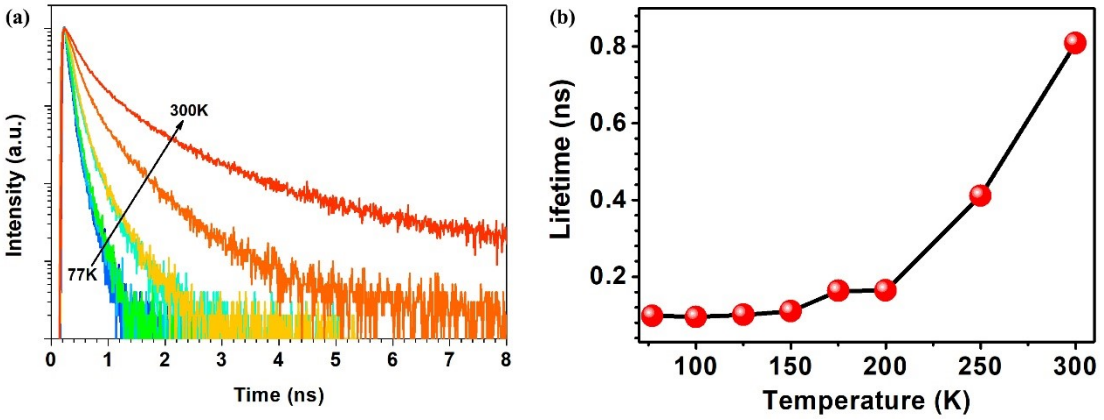


Figure S5. Temperature dependent PL decay profiles (emission wavelength 522 nm) of Cs_4PbBr_6 microcrystals at different temperatures in the 8 ns time window; (b) short PL lifetimes of Cs_4PbBr_6 microcrystals at different temperatures.

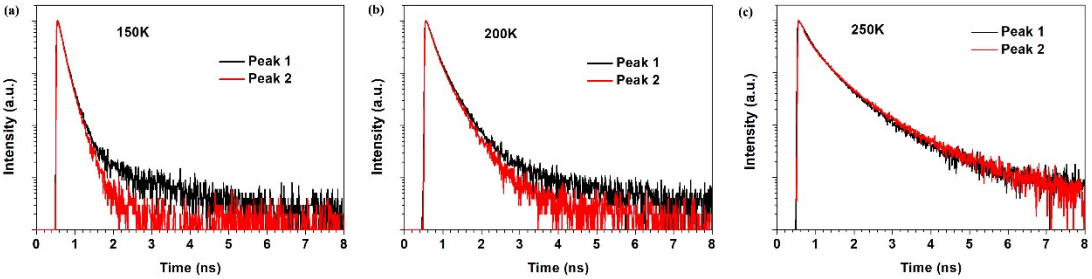
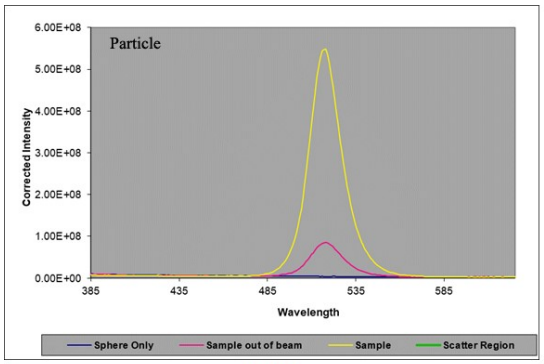
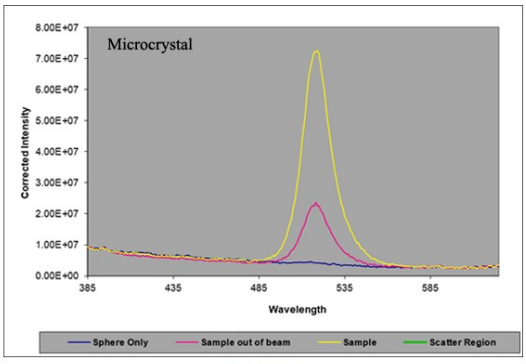


Figure S6. PL decay profiles of Cs_4PbBr_6 microcrystals measured at different emission wavelengths (peak1 532 nm and peak2 522 nm) at different temperatures.



Results					
Absorption	20.3%	Color			
Transmission	79.7%	x	0.0971	u'	0.0324
Absorbance	0.10	y	0.7665	v'	0.5747
Quantum Yield:	**116.3%**				
Corrected QY:	**85.1%**				



Results					
Absorption	5.9%	Color			
Transmission	94.1%	x	0.1059	u'	0.0347
Absorbance	0.03	y	0.7838	v'	0.5785
Quantum Yield:	**178.1%**				
Corrected QY:	**32.5%**				

Figure S7. Photoluminescence quantum yield measurement of Cs_4PbBr_6 particles and microcrystals in an integrating sphere.