

SUPPORTING INFORMATION

Synthesis of Mn^{2+} : $\text{CsPb}(\text{Br}_{1-x}\text{Cl}_x)_3$ perovskite quantum dots in an ambient atmosphere: stability analysis and self-powered photodetector applications

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OBSERVATIONS

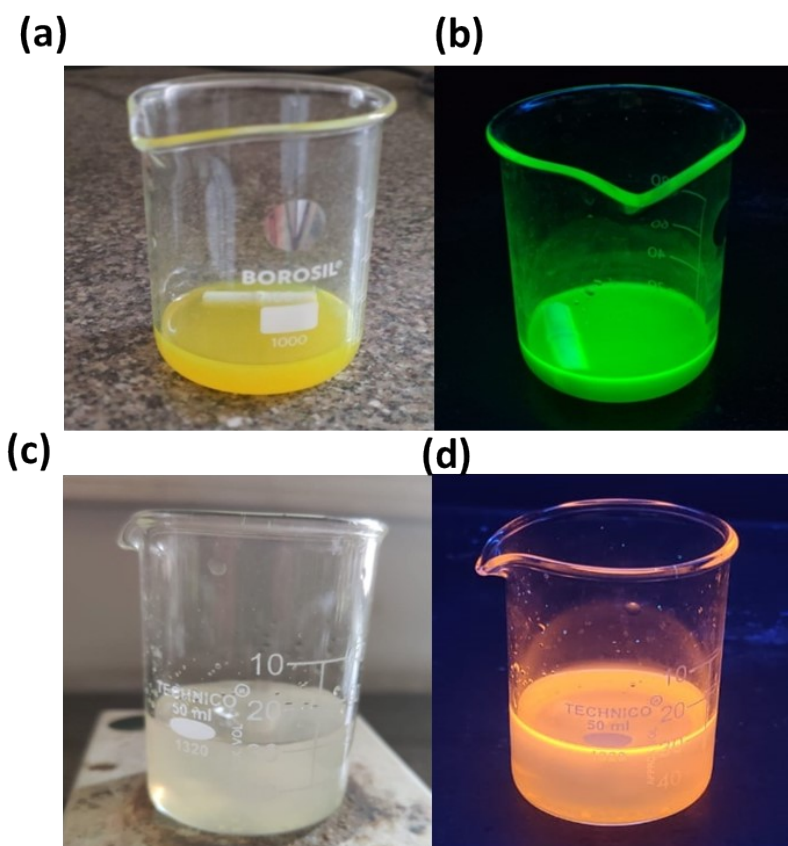


Fig. S1 (a) and (c) represents CsPbBr_3 and Mn doped CsPbBr_3 QDs under ambient light condition (b) and (d) indicates CsPbBr_3 and Mn doped CsPbBr_3 QDs while irradiating under UV light of 365 nm

STABILITY STUDY UNDER UV RADIATION (Wavelength - 365 nm)

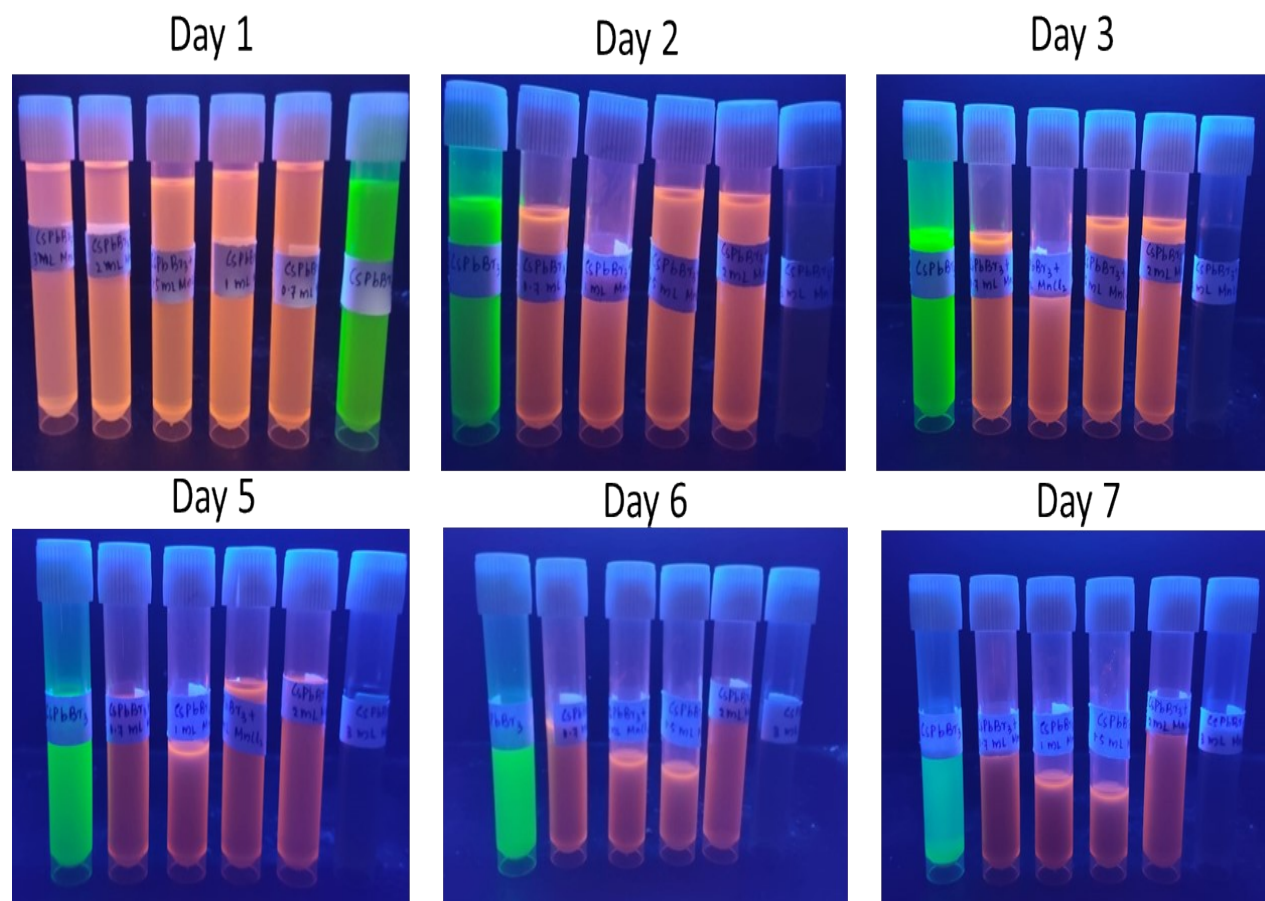


Fig. S2 Stability observation under UV-365 nm for CsPbBr₃ QDs and different concentration of Mn doped CsPbBr₃ QDs (a) Day 1 (b) Day 2 (c) Day 3 (d) Day 5 (e) Day 6 (f) Day 7

STABILITY ANALYSIS WITH PL SPECTRA

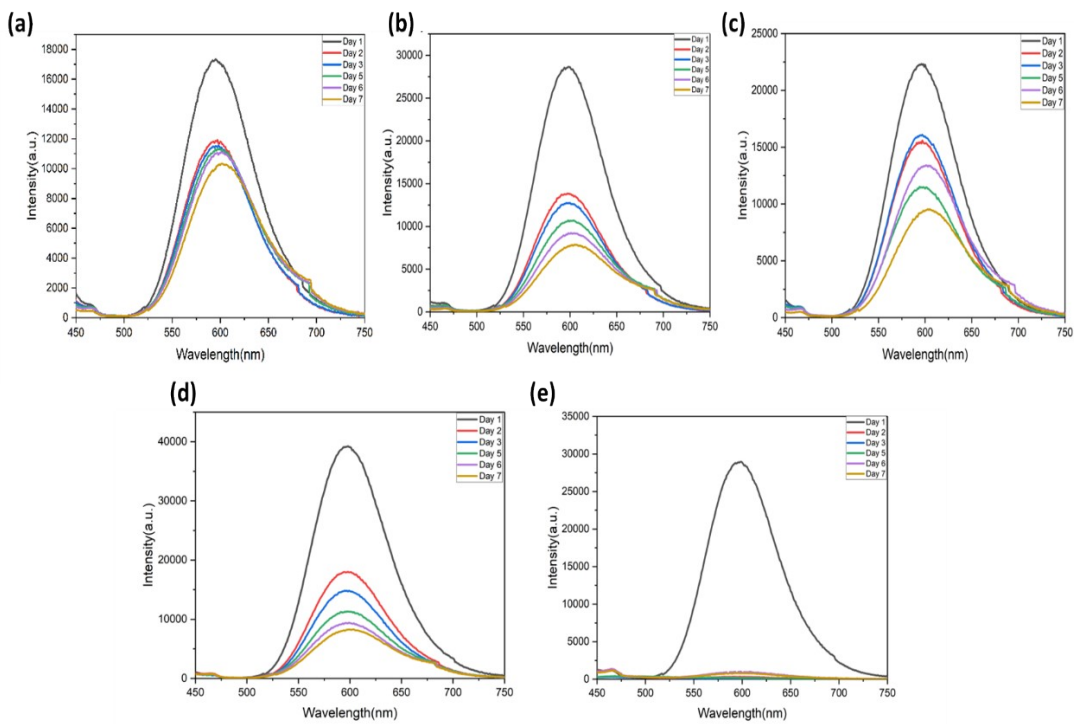


Fig.S3: Stability analysis with PL (a) 0.7 mmol Mn doped CsPbBr₃ (b) 1 mmol Mn doped CsPbBr₃ (c) 1.5 mmol Mn doped CsPbBr₃ (d) 2 mmol Mn doped CsPbBr₃ (e) 3 mmol Mn doped CsPbBr₃ .

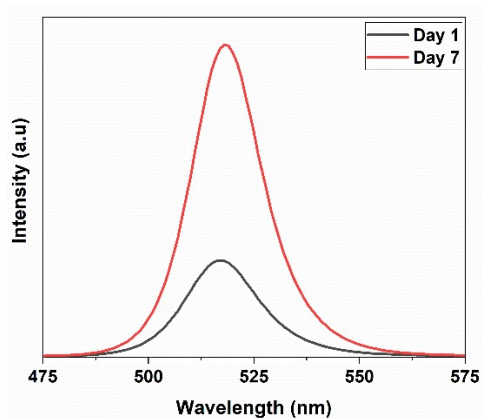


Fig S4: Comparison of PL spectra of bare CsPbBr₃ QD on day 1 and day 7.

CALCULATION OF CRYSTALLITE SIZE

Table S1: Calculation of crystallite size

	Peak position(2θ)	FWHM	Crystallite size D(nm)	Average D(nm)
CsPbBr ₃	15.09	0.53	15.03	12.87
	30.51	0.77	10.70	
0.7 mmol Mn doped CsPbBr ₃	15.54	0.43	18.66	19.95
	21.99	0.39	20.75	
	28.19	0.41	20.18	
	31.38	0.41	20.20	
3 mmol Mn doped CsPbBr ₃	6.81	0.27	29.93	28.28
	9.09	0.27	29.58	
	11.36	0.27	29.92	
	13.64	0.34	23.68	

Using Scherrer equation we can calculate crystallite size.

$$D = \frac{K\lambda}{\beta \cos\theta} \dots\dots\dots \text{Equation (1)}$$

Where D =crystallites size in nm, K = Scherrer constant=0.9, λ =Wavelength of X-Ray source=0.15406 nm, β = FWHM (radians), θ =Peak position (radians).

For CsPbBr₃ the average particle size calculated using Scherrer equation is 12.87 nm. 0.7 mmol Mn doped CsPbBr₃ has the average particle size is 19.95 nm and for 3 mmol Mn doped CsPbBr₃ the average particle size is 28.28 nm.

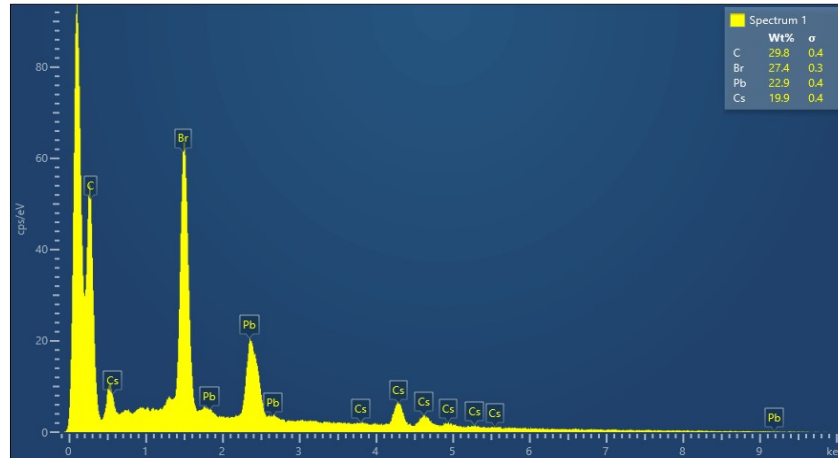


Fig. S5: EDX of CsPbBr₃ QDs

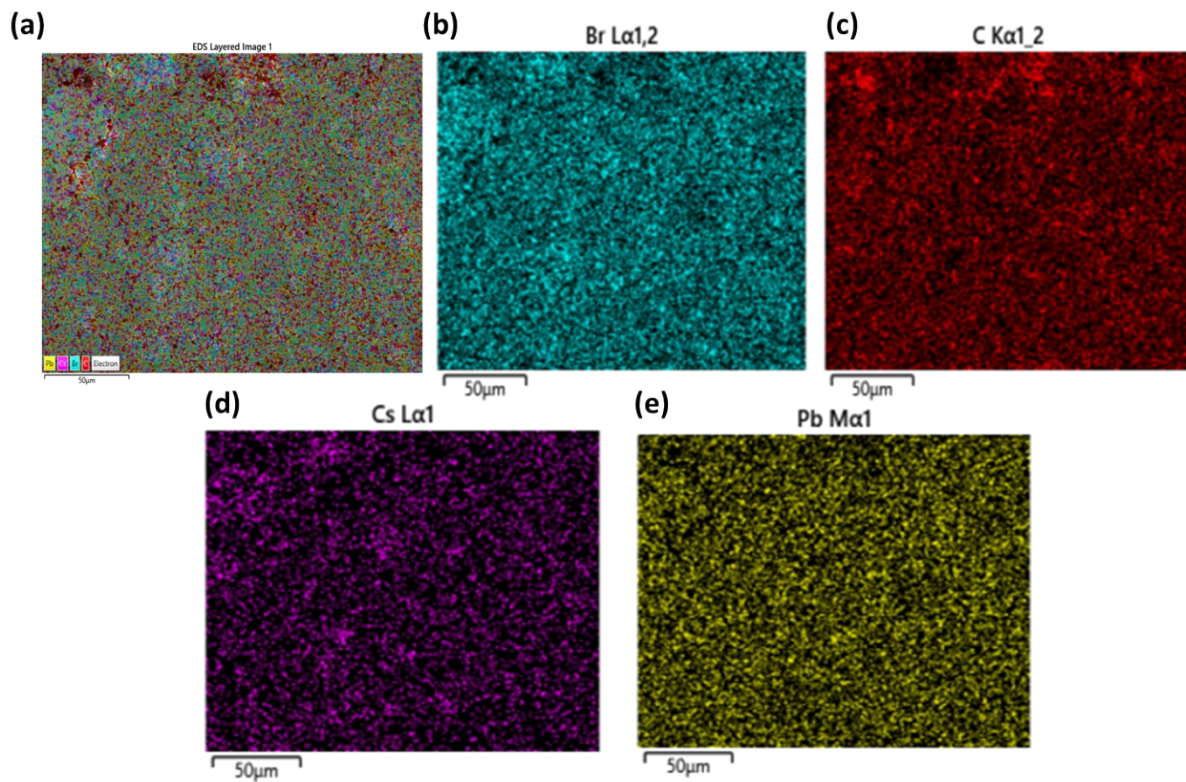


Fig S6: Elemental mapping of CsPbBr₃ QDs

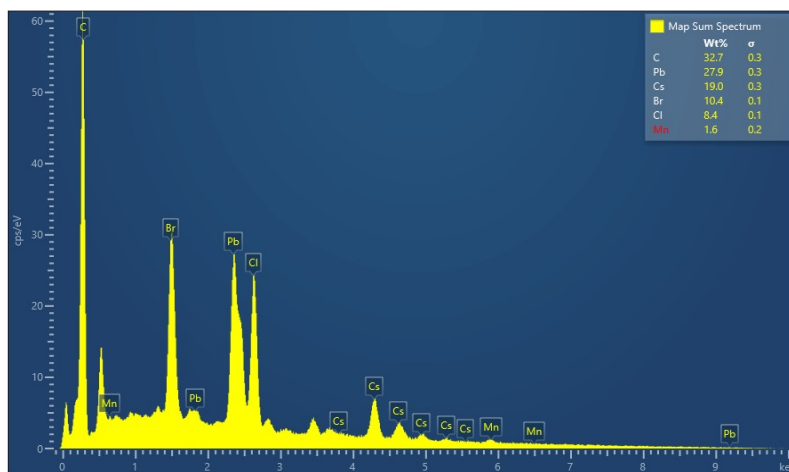


Fig S7: EDX of Mn doped CsPbBr₃ QDs

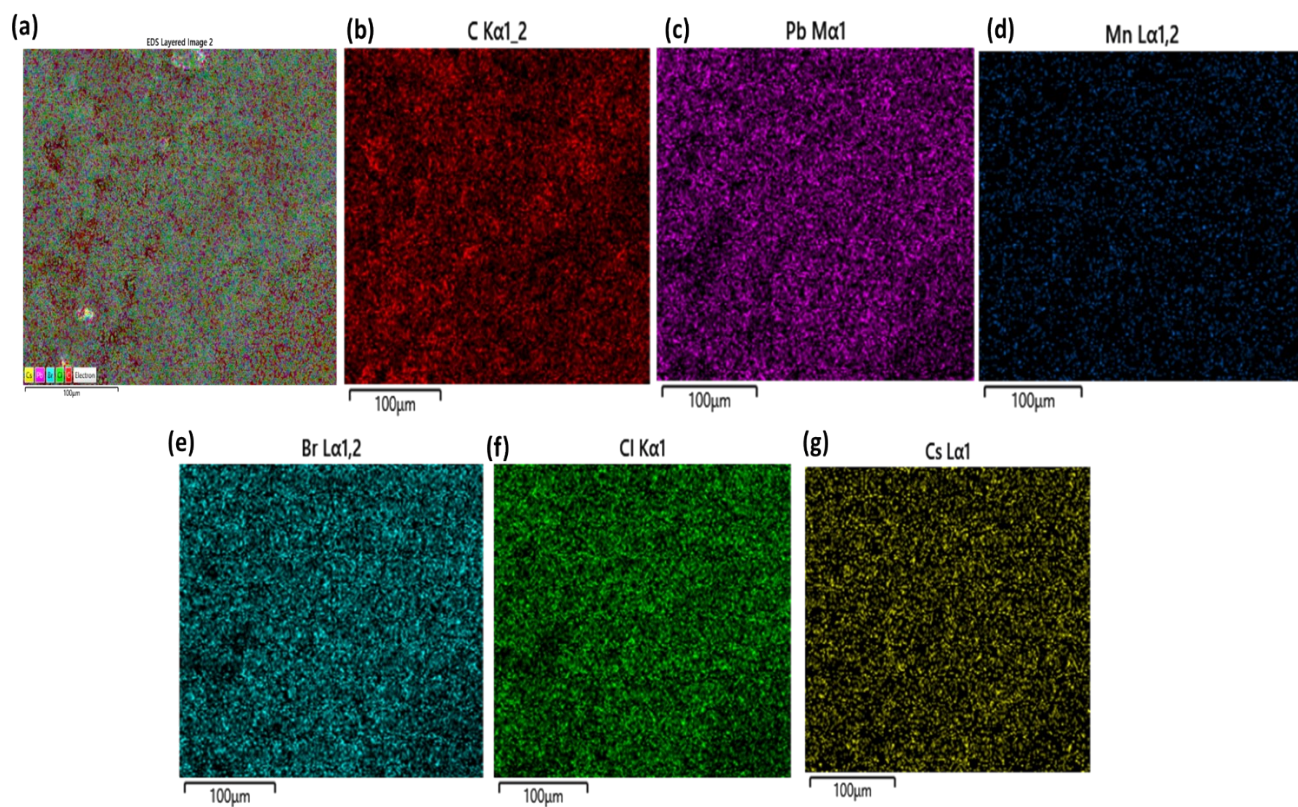


Fig S8: Elemental mapping of Mn doped CsPbBr₃ QDs 0.7 mmol