

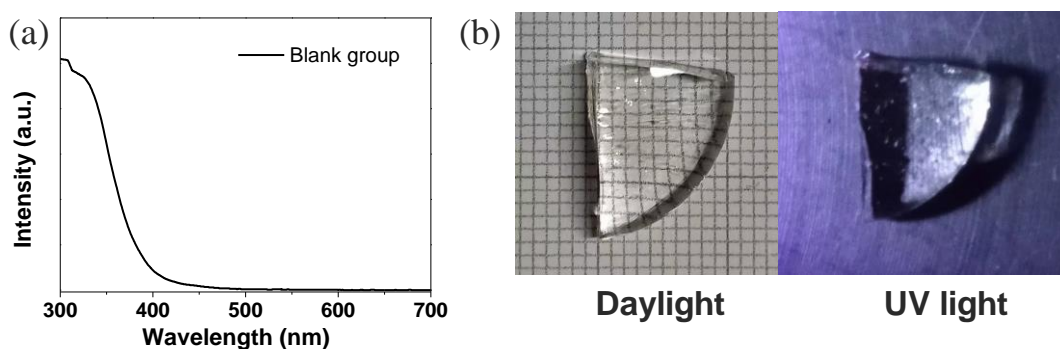
**Electronic Supporting Information for**

**Solid-State synthesis of cesium manganese halide nanocrystals in glass  
with bright and broad red emission for white LEDs**

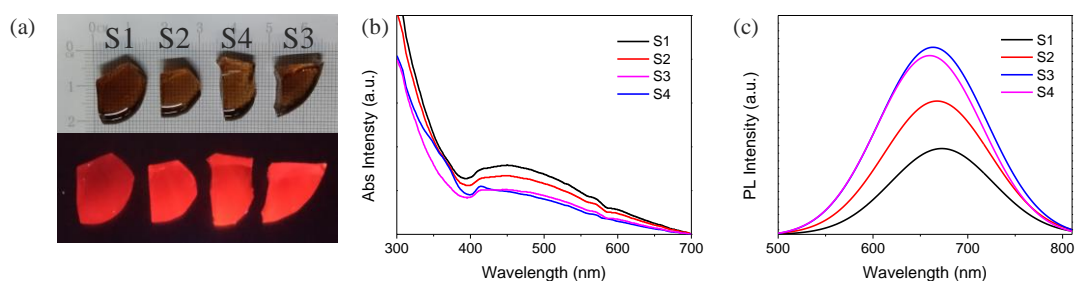
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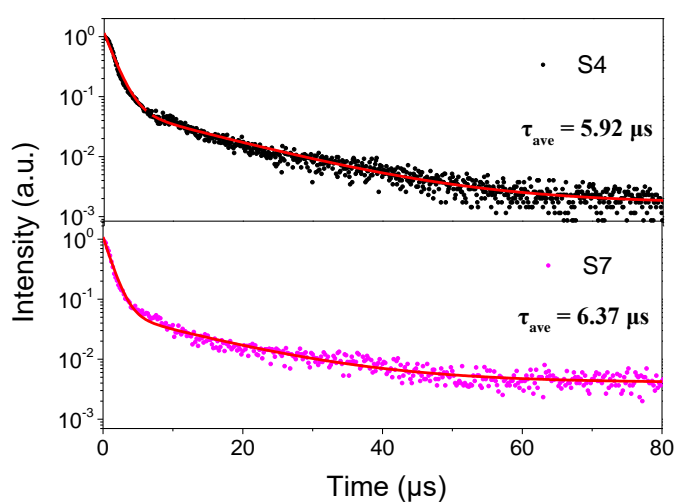
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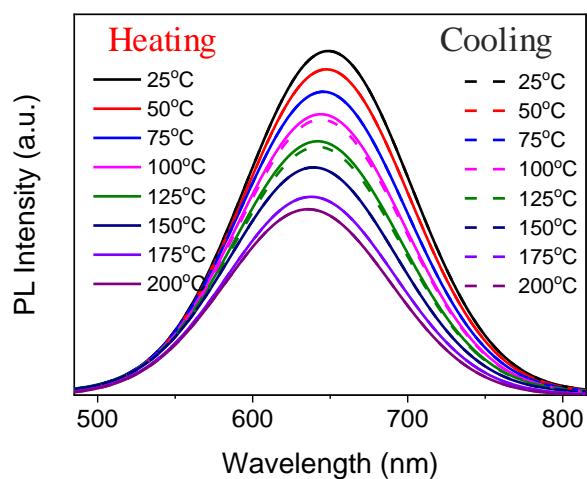
**Fig. S1** The optical properties of the blank group. (a) Absorption spectra. (b) Photographs of blank group under daylight and UV light.



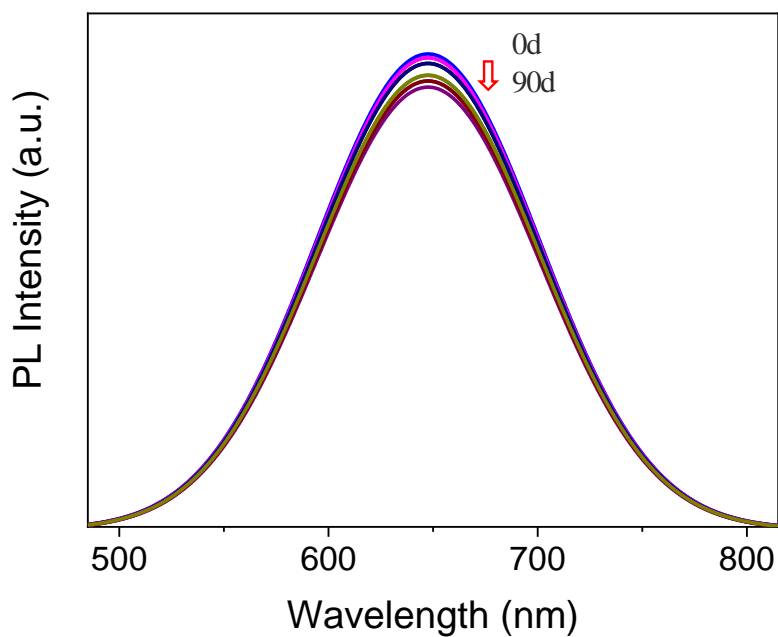
**Fig. S2** (a) Photographs of CsMnBr<sub>3</sub> NCs embedded glasses under daylight and UV light. (b) Absorption spectra, (c) PL spectra. Note: 15SiO<sub>2</sub>-30B<sub>2</sub>O<sub>3</sub>-10ZnO-1Cs<sub>2</sub>CO<sub>3</sub>-1MnCO<sub>3</sub>-xNaBr (x = 5, 7.5, 10, 12.5, denoted as S1, S2, S4, S3).



**Fig. S3** PL lifetime decay curves of CsMnBr<sub>3</sub> NCs embedded glasses.



**Fig. S4** Temperature-dependent PL spectra of CsMnBr<sub>3</sub> NCs embedded glasses.



**Fig. S5** The time dependent PL spectra of CsMnBr<sub>3</sub> NCs embedded glasses after soaking in water for 90 days.

**Table S1** Emission stability of the reported perovskites

Samples	Stability (Remnant PL intensity or PLQY)	Condition	Ref
CsPbBr <sub>3</sub> NCs	no emission	Water/1h	1
CsPbBr <sub>3</sub> -PBMA	78%PL	Air/30d	2
CsPbBr <sub>3</sub> -PBMA	56%PL	Water/2d	2
CsPbBr <sub>3</sub> -PMMA	53%PL	Water/15d	3
MAPbBr <sub>3</sub> -PS	93%PL	Water/60d	4
CsPbBr <sub>3</sub> NCs@glass	85%PL	Water/30d	5
CsPbBr <sub>3</sub> NCs@glass	90%PL	Water/30d	6
CsMnBr <sub>3</sub> NCs	Phase transformation	Air/several hours	7
CsMnBr <sub>3</sub> NCs	70%PLQY	Air/20d	8
CsMnBr <sub>3</sub> NCs@glass	95%PL	Water/90d	<b>This Work</b>

#### Additional Reference

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