

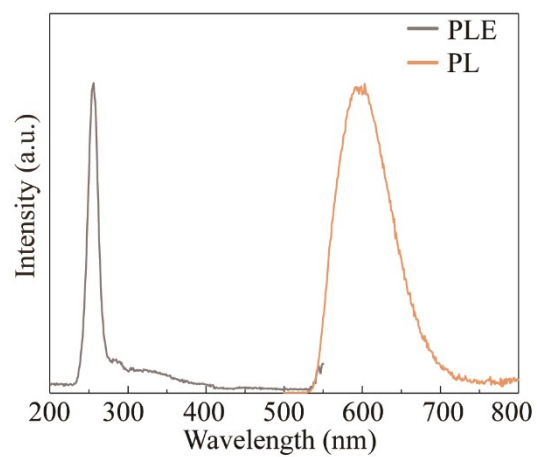
## Supporting Information

### **All-inorganic Mn<sup>2+</sup>-doped metal halide perovskite crystals toward late-time detection of X-ray afterglow imaging**

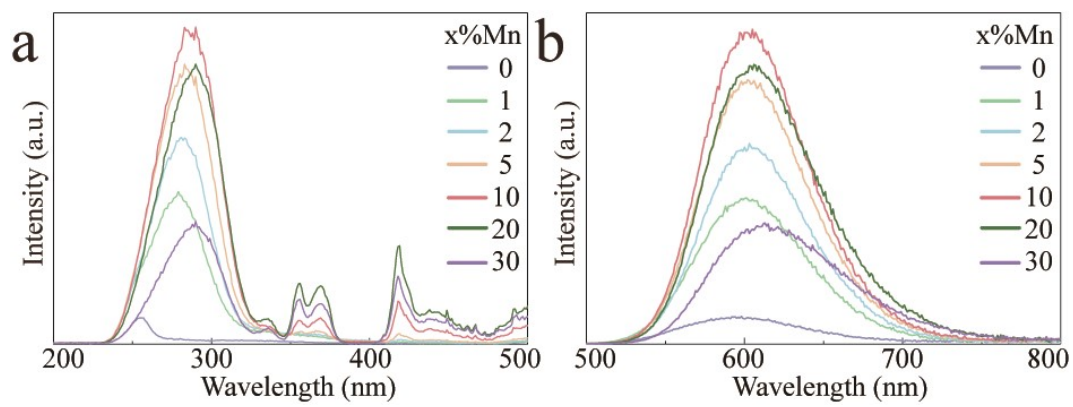
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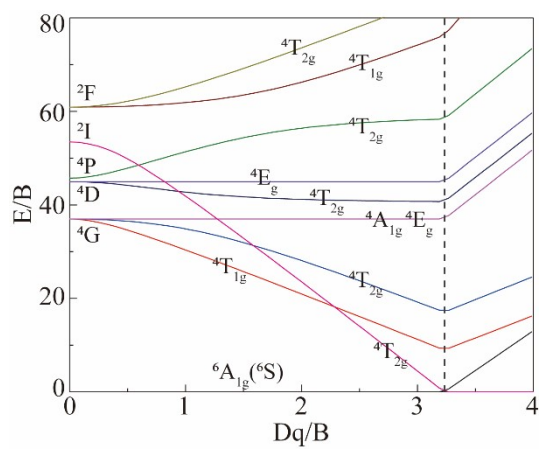
<sup>b</sup> *School of Electronics and Communications, Guangdong Mechanical & Electrical Polytechnic, Guangzhou 510515, P.R. China.*



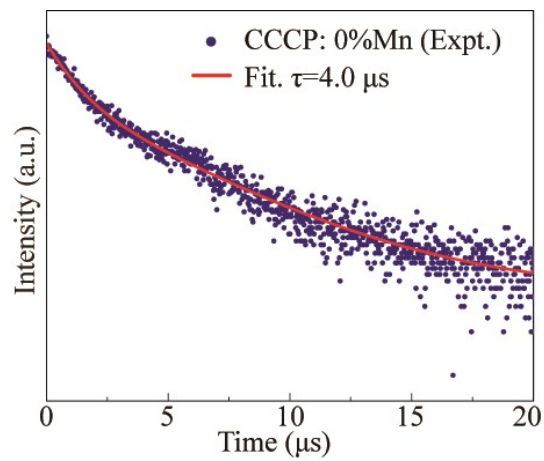
**Figure S1.** PLE/PL spectra of undoped CCCP crystal.



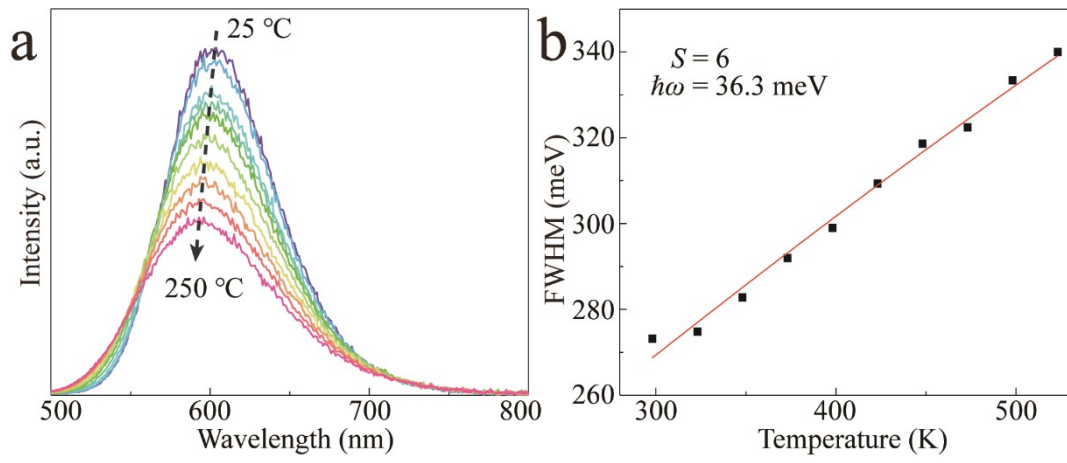
**Figure S2.** a) PLE and b) PL spectra of CCCP:x%Mn (x=0-30) crystals.



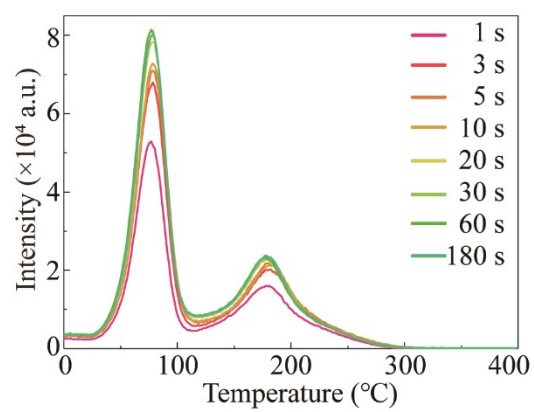
**Figure S3.** Tanabe-Sugano diagram for the illustration of Mn<sup>2+</sup> fluorescence in CCCP crystals.



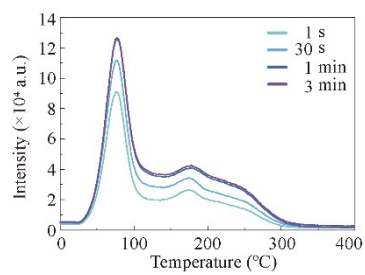
**Figure S4.** Fluorescence decay curves of CCCP:0%Mn ( $\lambda_{\text{ex}}=255 \text{ nm}$ ,  $\lambda_{\text{em}}=596 \text{ nm}$ ).



**Figure S5.** a) Temperature-dependent PL spectra of CCCP:10%Mn. b) Fitting diagram of FWHM and temperature.

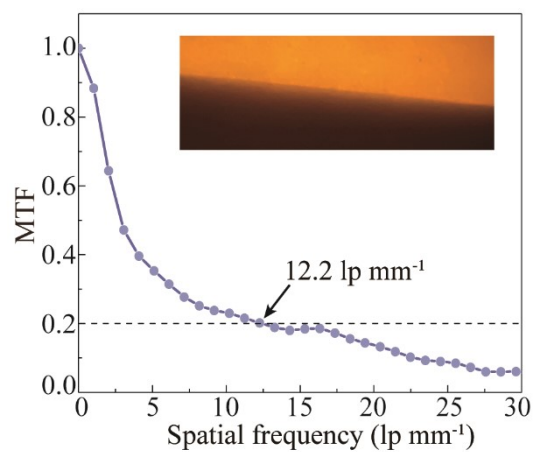


**Figure S6.** TL curves of CCCP:2%Mn crystals collected after 254 nm UV light excitation for different times (1-180 s).



**Figure S7.** TL curves of CCCP:2%Mn crystals collected after X-ray irradiation for different times (1 s-3 min).





**Figure S8.** MTF curve of the CCCP:2%Mn flexible film, measured by the slanted-edge method (inset).