All-inorganic lead-free double perovskite $Cs_2NaInCl_6$ for fiber-based optical temperature sensing for temperature and safety monitoring

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Keywords: Optical temperature sensing, Fiber-based, Double halide perovskites, $Cs_2NaInCl_6$, Tunable dual emission

Supporting Figures

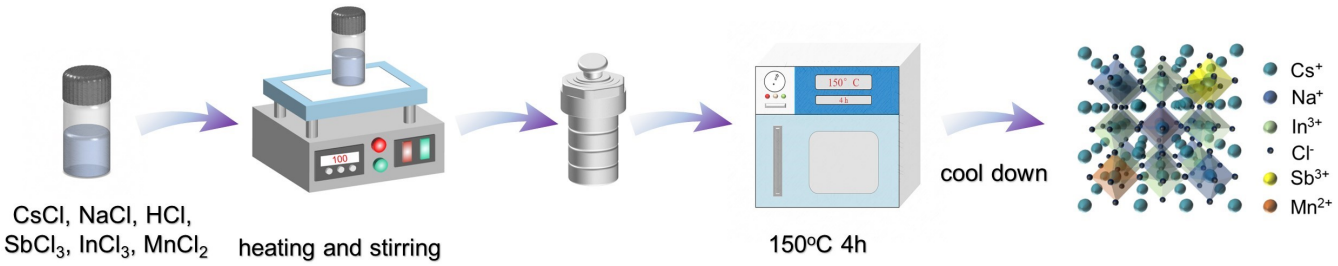

Fig. S1. Schematic illustration of the synthesis process of $Cs_2NaInCl_6$:Sb^{3+}-Mn^{2+} double perovskites using the hydrothermal method.

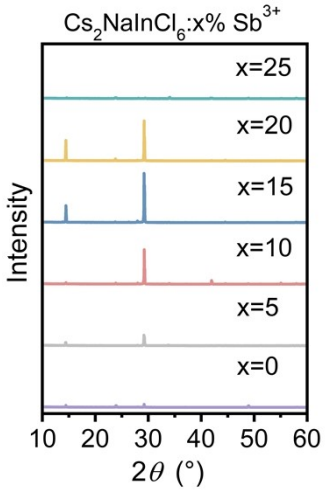

Fig. S2. XRD patterns of $Cs_2NaInCl_6$ double perovskites doped with various amounts of Sb^{3+}.

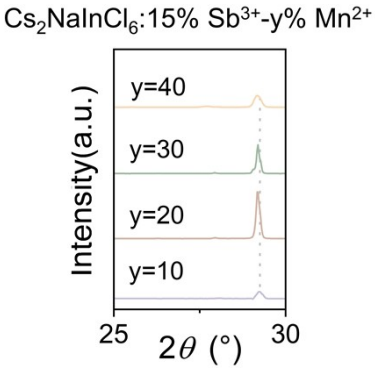

Fig. S3. XRD patterns of $Cs_2NaInCl_6$-Sb^{3+} doped with various amounts of Mn^{2+}, showing enlarged characteristic peaks at 29.3°.

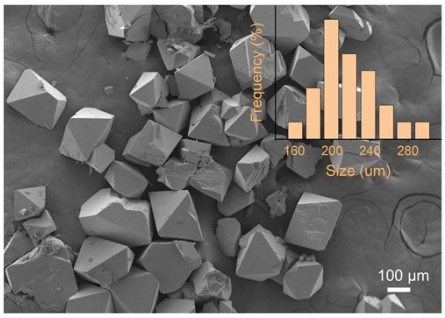

Fig. S4. SEM image of $Cs_2NaInCl_6$:Sb^{3+}-Mn^{2+}, with the inset showing the particle size distribution.

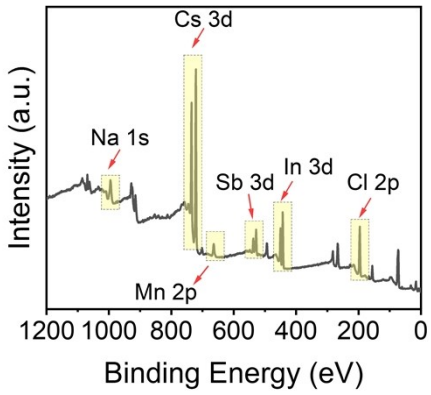

Fig. S5. XPS of 15% Sb^{3+}-20% Mn^{2+} co-doped $Cs_2NaInCl_6$:

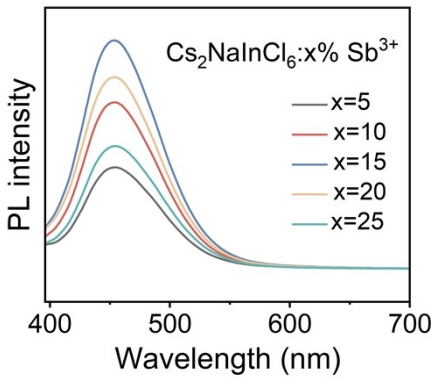

Fig. S6. PL spectra of $Cs_2NaInCl_6$:x% Sb^{3+}.

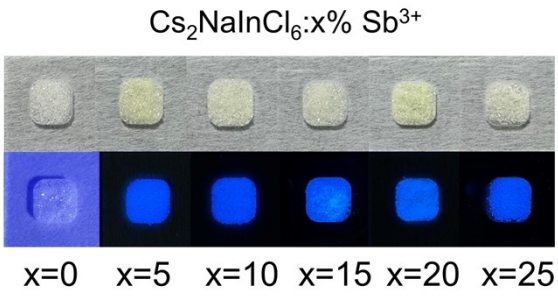

Fig. S7. Photographs of $Cs_2NaInCl_6$:x% Sb^{3+} under visible light (top) and a 365 nm UV lamp (bottom) show that the luminous intensity is strongest when x=15%.

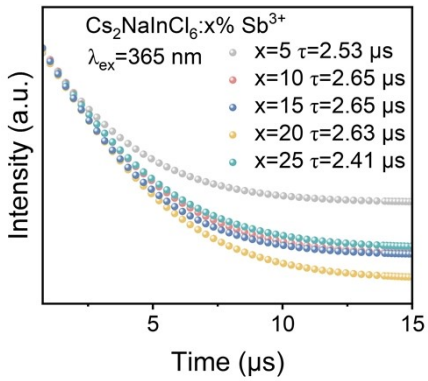

Fig. S8. Decay curves of $Cs_2NaInCl_6$:x% Sb^{3+}.

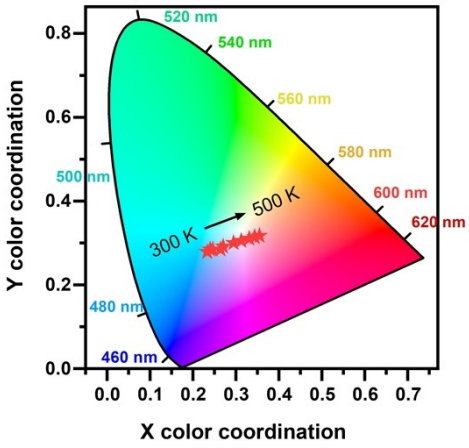

Fig. S9. Corresponding 1931 CIE emission color coordinates of emission spectra.

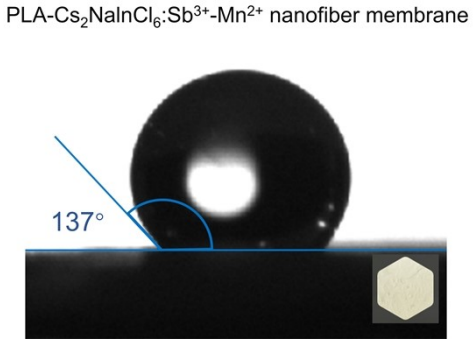

Fig. S10. Contact angle of PLA-$Cs_2NaInCl_6$:Sb^{3+}-Mn^{2+} nanofiber membrane.