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

Supporting information

Table. S1 Wavelengths and wavenumbers for the excitation and emission peaks of Mn^{2+} and Er^{3+} ions from $KZnF_3$, $KCdF_3$ and $CsCdF_3$ materials, respectively.

Hosts	Excitation		Emission	
Mn^{2+} ($^4T_1$)	Wavelength (nm)	Wavenumber (cm^{-1})	Wavelength (nm)	Wavenumber (cm^{-1})
$KZnF_3$	538	18587	585	17094
$KCdF_3$	513	19493	564	17730
$CsCdF_3$	493	20284	540	18518

Energy levels	Emission	
Er^{3+}	Wavelength (nm)	Wavenumber (cm^{-1})
Er ($^4S_{3/2}$)	520	19230
Er ($^2H_{11/2}$)	540	18518
Er ($^4F_{9/2}$)	660	15152

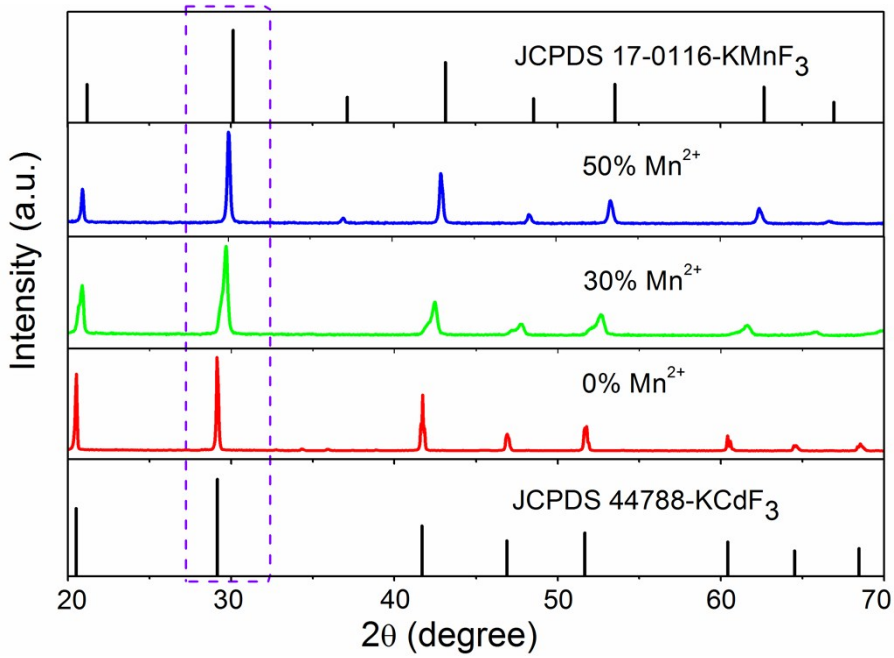

Fig. S1 XRD patterns of varied Mn^{2+} doped $KCdF_3$:0.5%Yb^{3+}/0.5%Er^{3+} products.

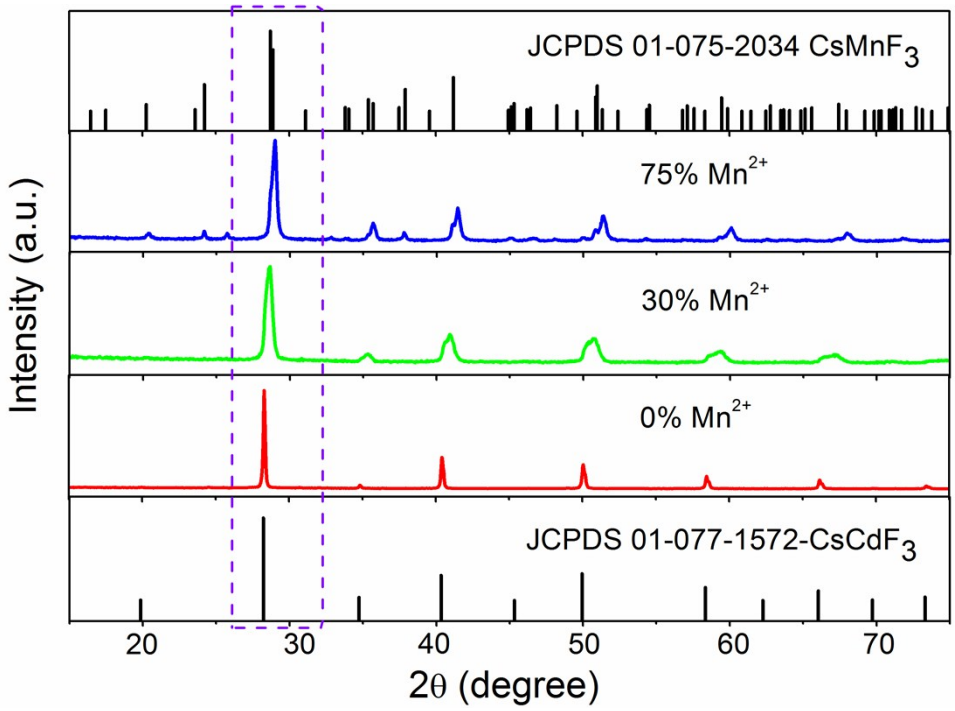

Fig. S2 XRD patterns of varied Mn^{2+} doped $CsCdF_3$:0.5%Yb^{3+}/0.5%Er^{3+} products.

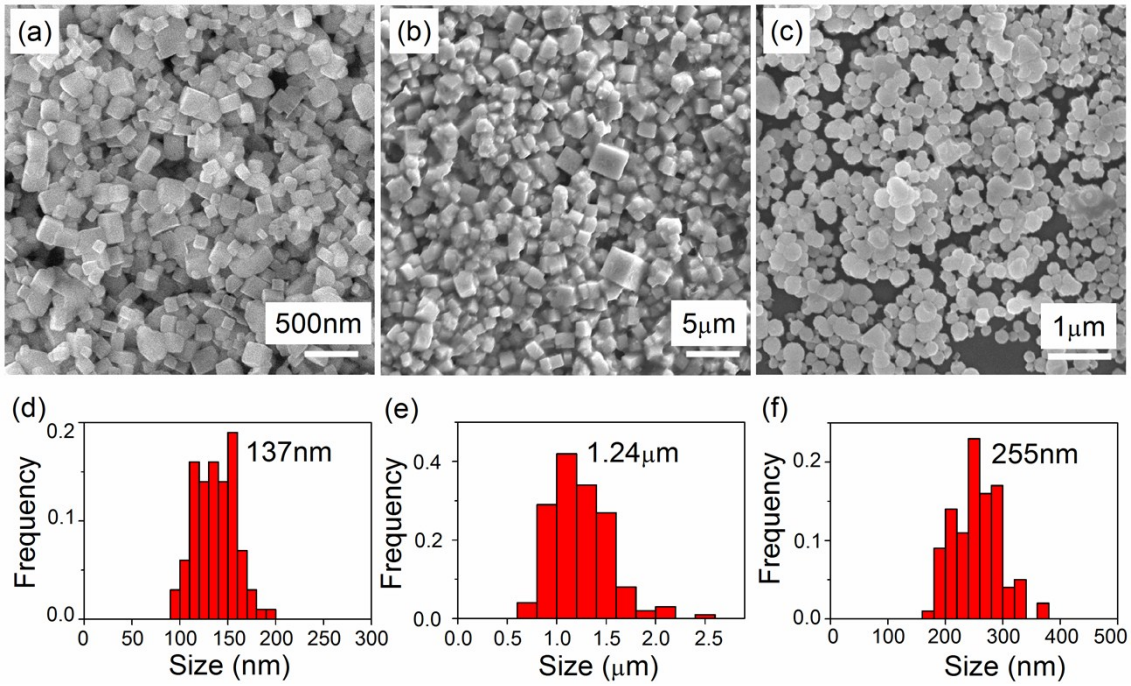

Fig. S3 SEM images of 0.5%Yb^{3+}/0.5%Er^{3+}/5%Mn^{2+} codoped (a) $KZnF_3$, (b) $KCdF_3$, (c) $CsCdF_3$ respectively. (d), (e), (f) show the corresponding size distribution of ABF_3 (A= K, Cs; B= Zn, Cd) in (a), (b), (c) respectively.

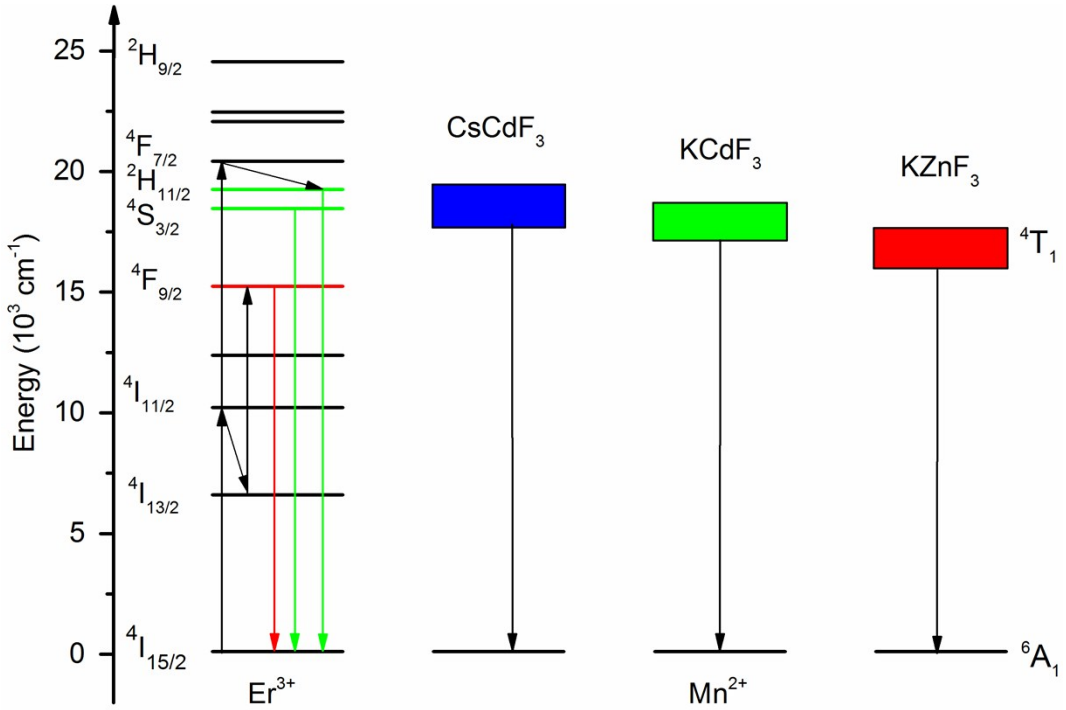

Fig. S4 Energy diagram of Er^{3+} ions and Mn^{2+} ions in ABF_3:0.5%Yb^{3+}/0.5%Er^{3+}/5%Mn^{2+} (A= K, Cs; B= Zn, Cd) nanocrystals.

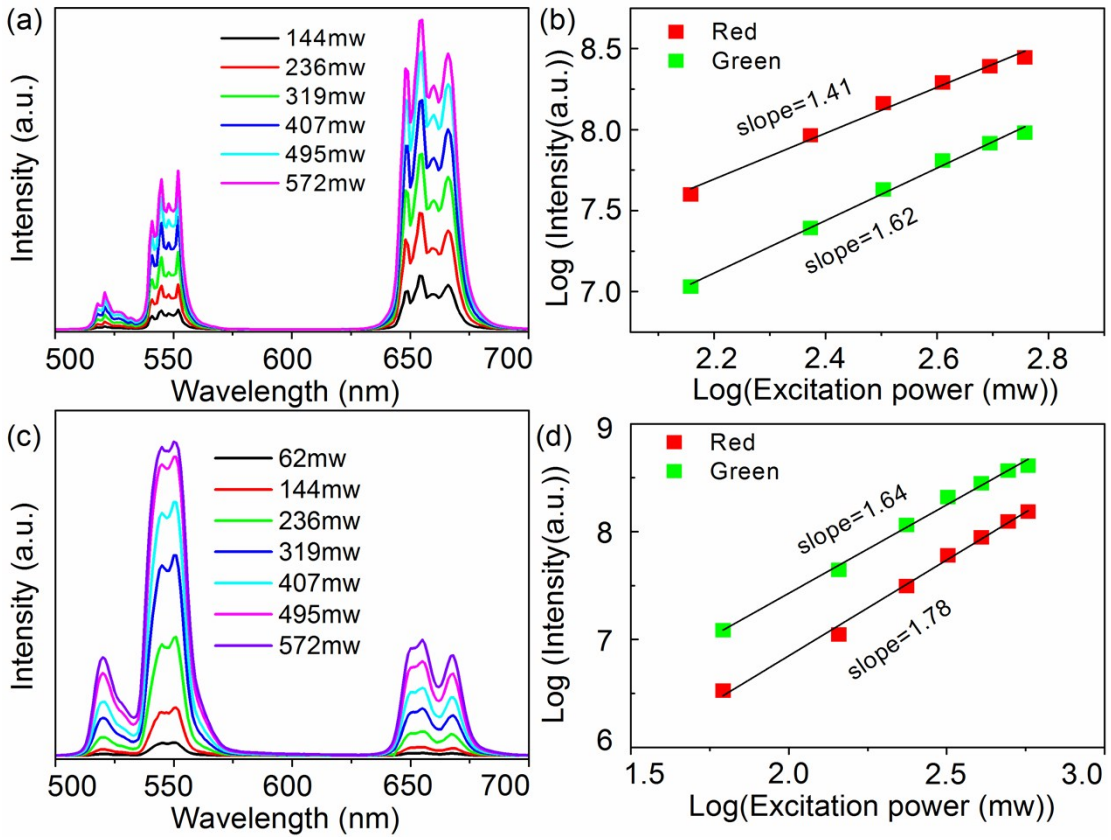

Fig. S5 UC spectra of (a) $KCdF_3$:0.5%Yb^{3+}/0.5%Er^{3+} and (c) $CsCdF_3$:0.5%Yb^{3+}/0.5%Er^{3+} under different excitation power; the corresponding Log (UC intensity) – Log (Excitation power) plot for green and red emission of Er^{3+} in (b) $KCdF_3$ and (d) $CsCdF_3$, respectively.