DMF-mediated polycrystalline phase transition of Cd-based perovskites: dual-emission tuning for temperature sensing and single-component white LEDs

Wenxiao Dong,[†a, d] Miao Shi,[† a] Wenjie Dong,[b] Huichao He,[a] Hanmei Jiang,[a] Zhengwen Yang,[c] Jianbei Qiu [c] and Tao Han [*a]

[a.]College of Materials and New Energy, Chongqing University of Science and Technology, Chongqing 401331, P. R. China. *E-mail: danbaiht@126.com.

[b.]BYD Communication Signal Co., Ltd, Shenzhen, 518000, P. R. China.

[c.]College of Materials Science and Engineering, Kunming University of Science and Technology, Kunming, 650093, Yunnan, P. R. China.

[d.]Guizhou Tyre Co., Ltd, Guizhou, 550008, P. R. China.

[†] The authors contribute equally.

Table S1 Dual phase relative content of $CsCdCl_3$ - $Cs_3Cd_2Cl_7$ transformation process.

DMF/HCl	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
$CsCdCl_3$ (%)	100	100	100	73	60	57	24	22	0	0	0
$Cs_3Cd_2Cl_7$ (%)	0	0	0	27	40	43	76	78	100	100	100

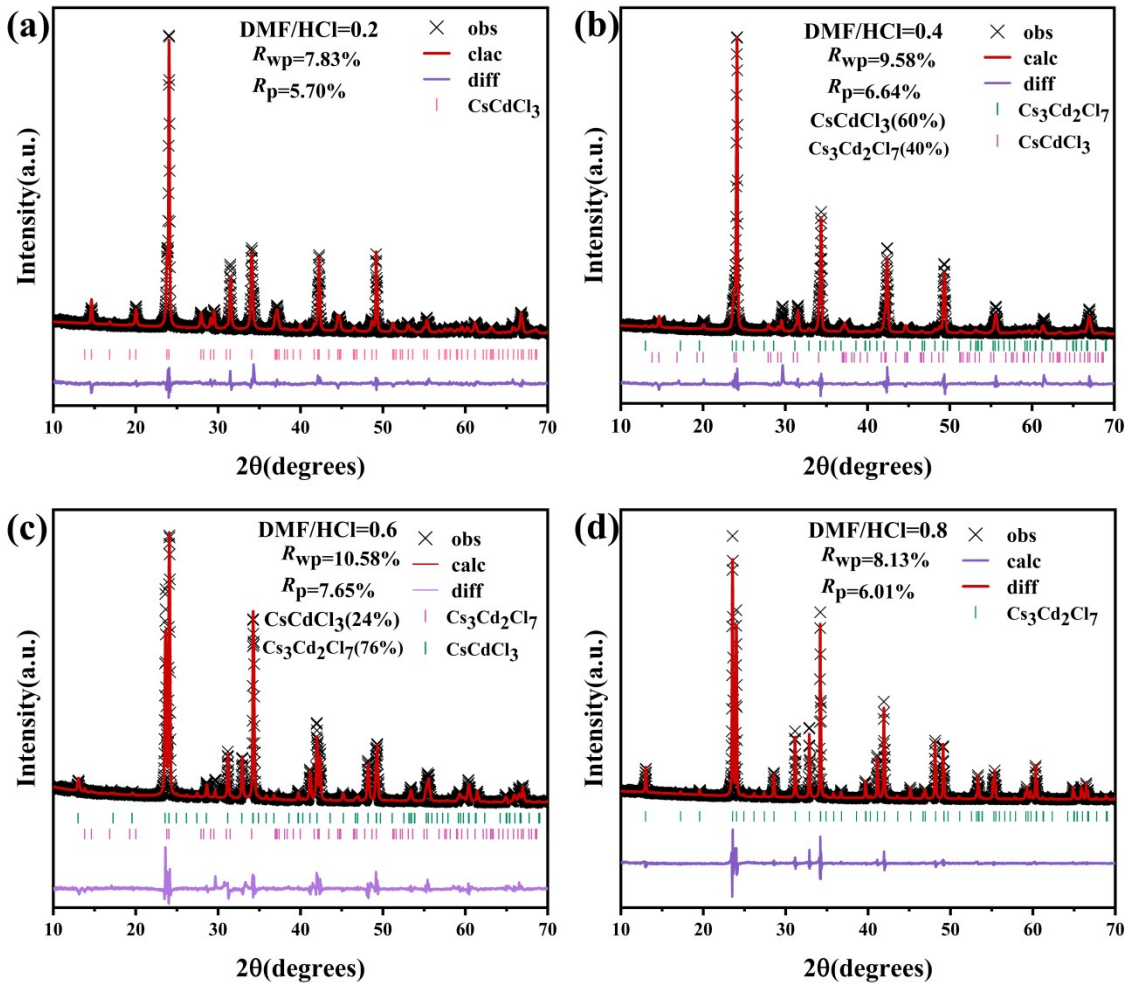

Figure S1. XRD refinement of DMF/HCL by 0.2 (a), 0.4 (b), 0.6 (c), 0.8 (d).

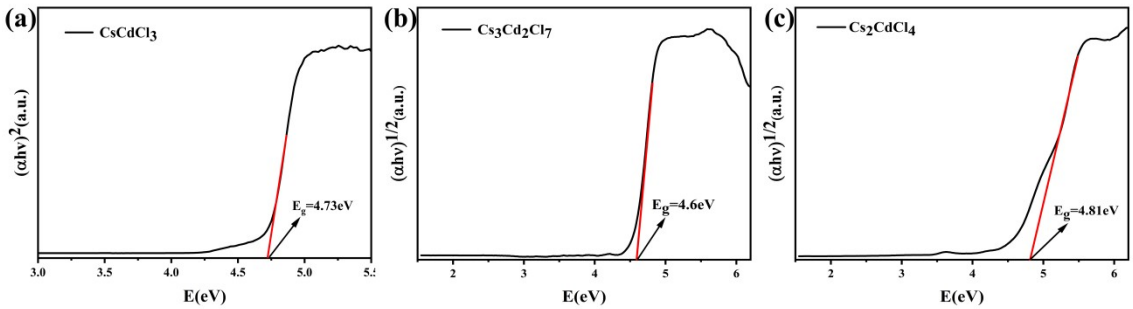

Figure S2. Tauc plot of $CsCdCl_3$ (a) , $Cs_3Cd_2Cl_7$ (b), and Cs_2CdCl_4 (c).

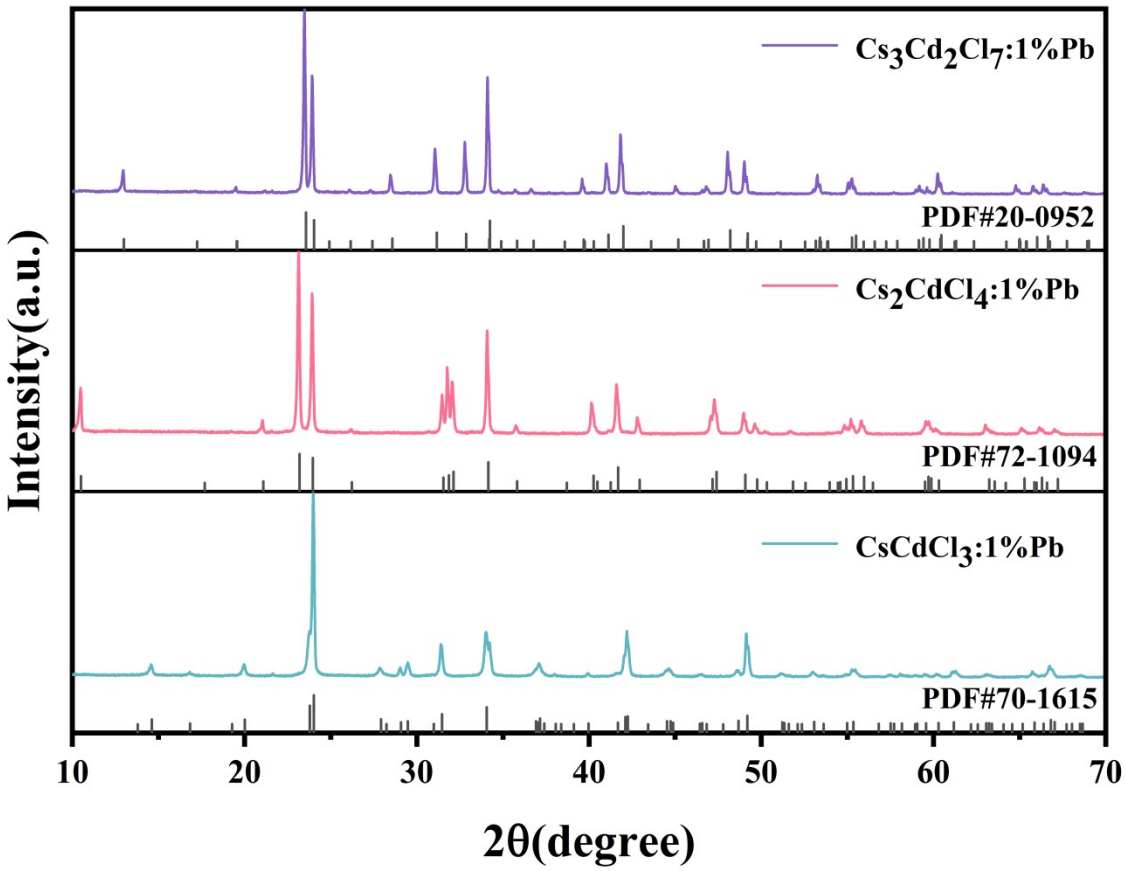

Figure S3. XRD patterns of $CsCdCl_3$:1%Pb, Cs_2CdCl_4:1%Pb, $Cs_3Cd_2Cl_7$:1%Pb

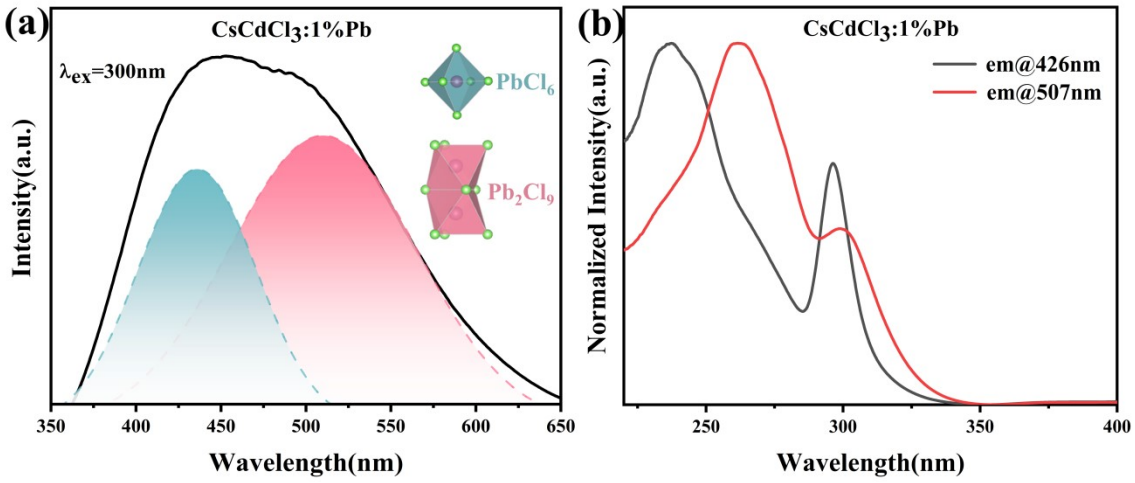

Figure S4. Gaussian fit of PL spectrum of $CsCdCl_3$:1%Pb under 300 nm excitation (a), and PLE spectra under 426 nm and 507 nm emission (b).

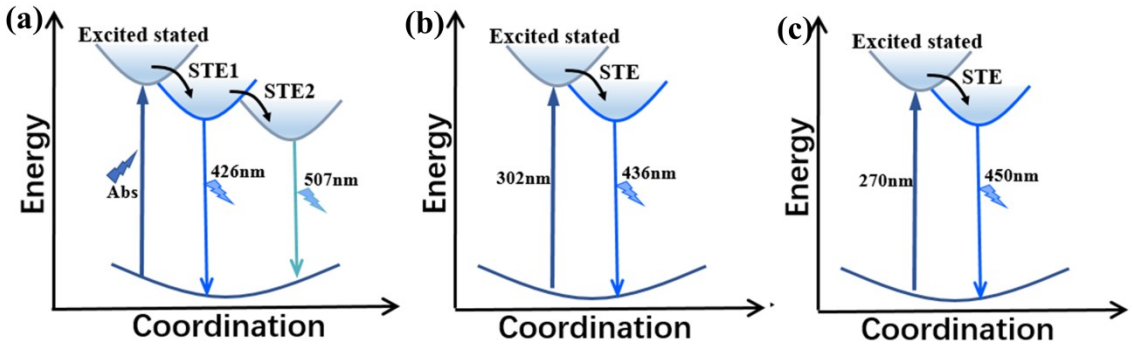

Figure S5. Luminescence emission mechanism diagram of $CsCdCl_3$:1% Pb (a), $Cs_3Cd_2Cl_7$:1%Pb (b), Cs_2CdCl_4:1% Pb (c).

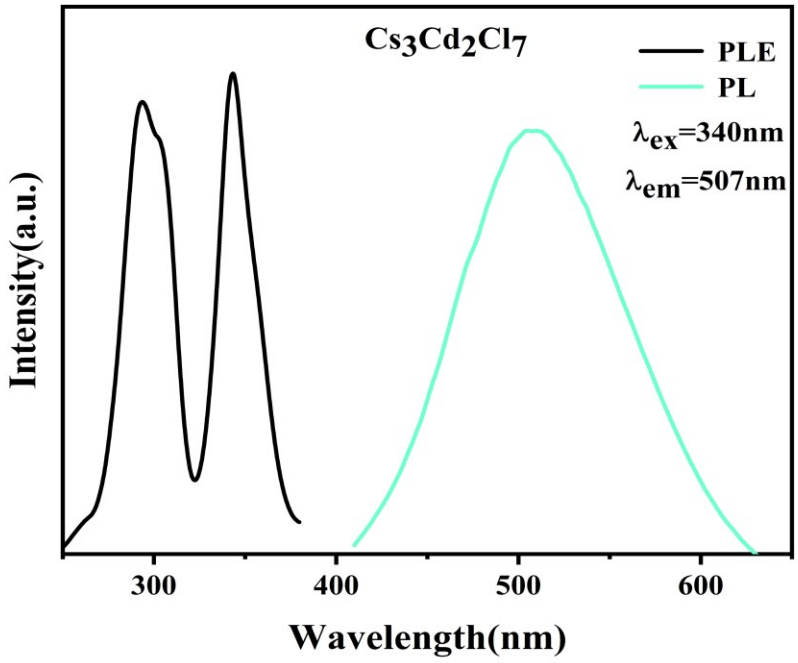

Figure S6. PL and PLE spectra of $Cs_3Cd_2Cl_7$.

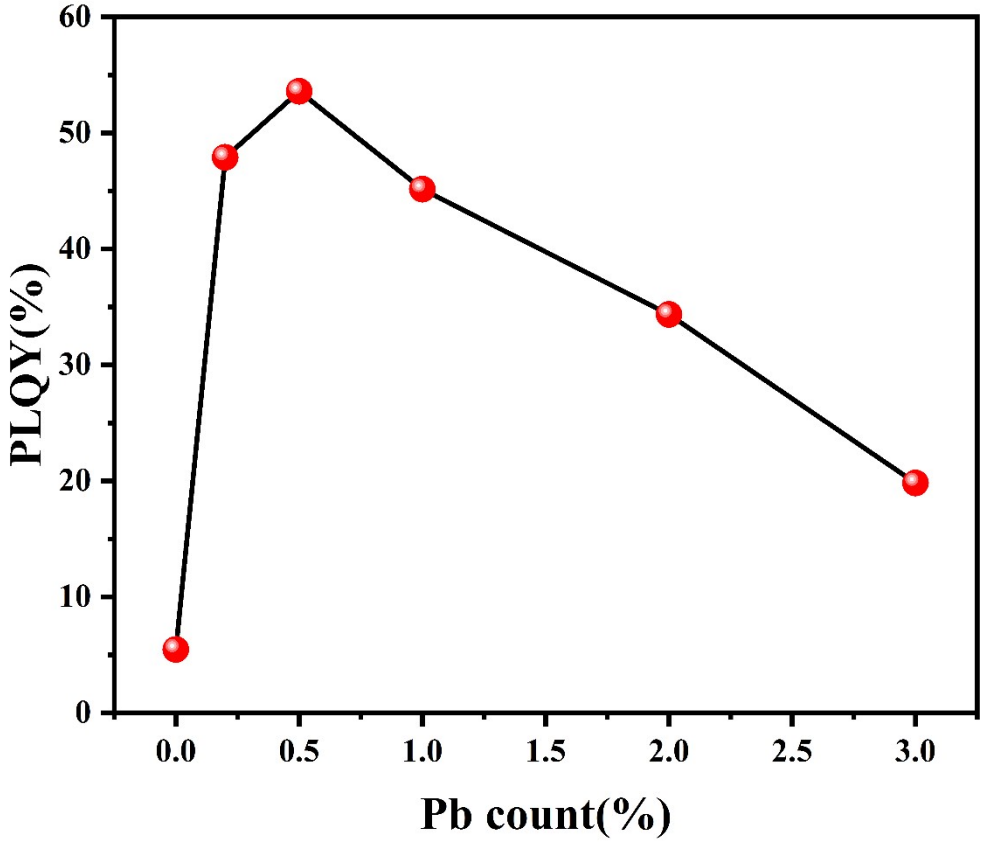

Figure S7. The PLQY of different Pb^{2+} doping concentrations.