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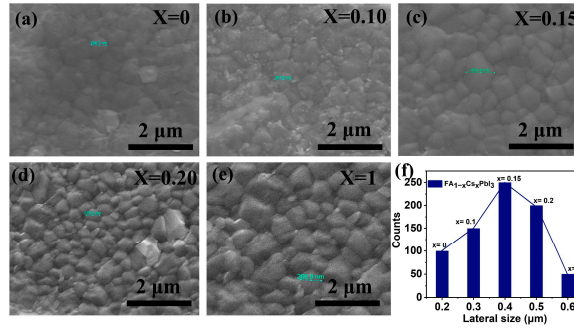
# Supporting Information

## Facile Fabrication of Mixed-Cation $\text{FA}_{1-x}\text{Cs}_x\text{PbI}_3$ Perovskites Thin Films for Photodetector Applications

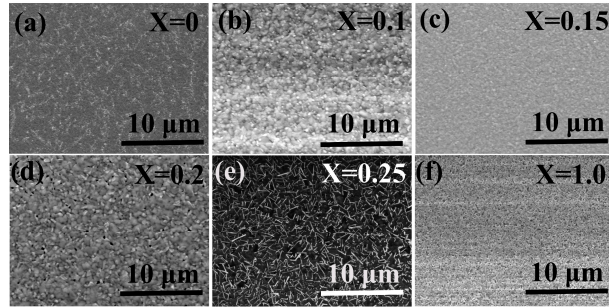
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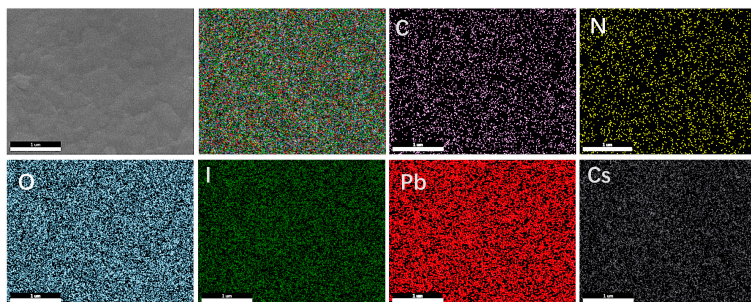
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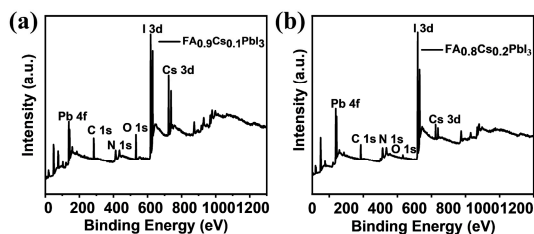
**Figure S1.** (a–e) SEM images of  $\text{FA}_{1-x}\text{Cs}_x\text{PbI}_3$  thin films with different  $\text{Cs}^+$  contents ( $x = 0, 0.10, 0.15, 0.20$  and 1, respectively). (f) Statistical diagram of the grain sizes of the  $\text{FA}_{1-x}\text{Cs}_x\text{PbI}_3$  thin films.



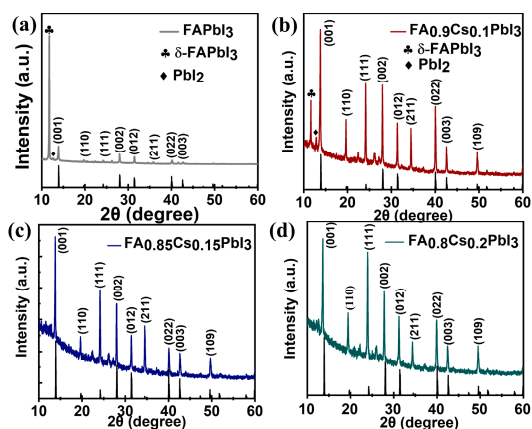
**Figure S2.** (a–f) SEM images of  $\text{FA}_{1-x}\text{Cs}_x\text{PbI}_3$  thin films with different  $\text{Cs}^+$  contents ( $x = 0, 0.10, 0.15, 0.20, 0.25$ , and 1.0, respectively).



**Figure S3.** EDX elemental mapping of  $\text{FA}_{0.85}\text{Cs}_{0.15}\text{PbI}_3$  thin film.



**Figure S4.** Survey XPS spectra of (a)  $\text{FA}_{0.9}\text{Cs}_{0.1}\text{PbI}_3$  and (b)  $\text{FA}_{0.8}\text{Cs}_{0.2}\text{PbI}_3$ , respectively.



**Figure S5.** (a-d) XRD patterns of  $\text{FAPbI}_3$ ,  $\text{FA}_{0.9}\text{Cs}_{0.1}\text{PbI}_3$ ,  $\text{FA}_{0.85}\text{Cs}_{0.15}\text{PbI}_3$  and  $\text{FA}_{0.8}\text{Cs}_{0.2}\text{PbI}_3$  thin films, respectively.

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**Table S1.** The PL data of  $\text{FA}_{1-x}\text{Cs}_x\text{PbI}_3$  thin films ( $x = 0, 1, 0.1, 0.15$  and  $0.2$ , respectively) with peak intensity, wavelength position, and FWHM.

	<b>X=0</b>	<b>X=1</b>	<b>X=0.10</b>	<b>X=0.15</b>	<b>X=0.20</b>
<b>Intensity (A.U)</b>	12457	13850	12700	97806	71143
<b>Wavelength (nm)</b>	801	760	790	789	788
<b>FWHM (nm)</b>	44.15	42.31	42.58	36.18	42.42