

Supporting Information

Synergistic Effect of Non-stoichiometry and Sb-doping on Air-stable α -CsPbI₃ for Efficient Carbon-based Perovskite Solar Cells

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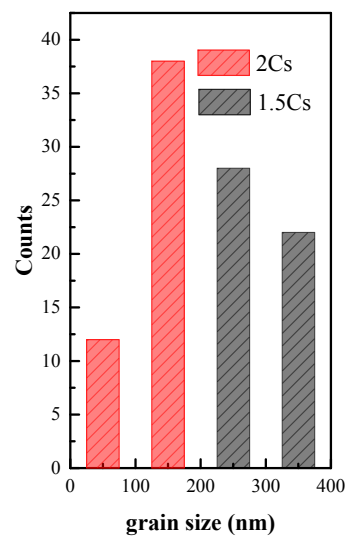


Figure S1. The grain size distribution of the films obtained at the CsI:PbI₂ ratio of 1.5:1 and 2:1.

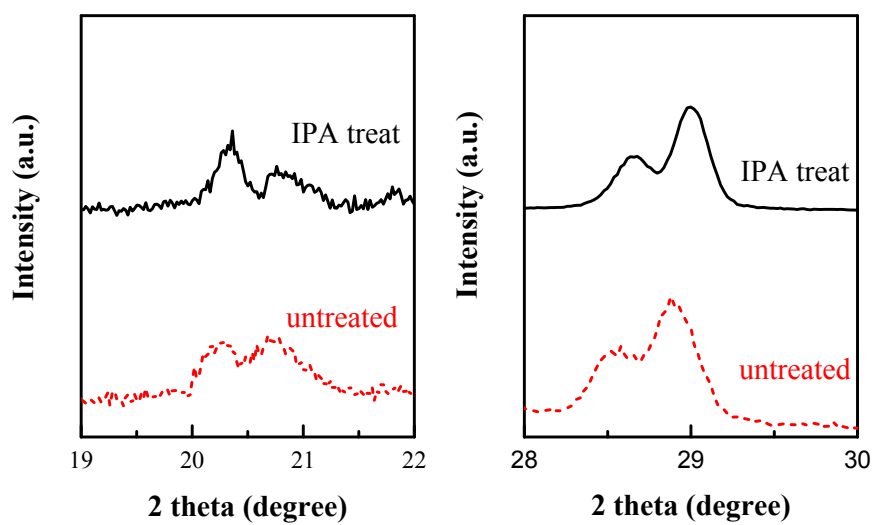


Figure S2. XRD patterns. (110) and (200) peaks show peak splitting and shoulder, respectively, in the film processed with excess CsI before and after IPA treatment.

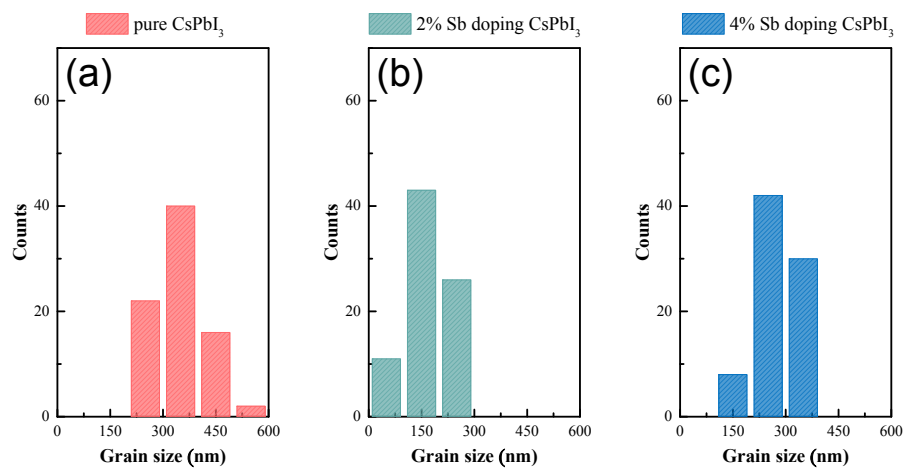


Figure S3. The grain size distribution of the films obtained at different Sb³⁺ doping contents. (a) 0 %, (b) 2 % and (c) 4 %.

Table S1. Composition of CsPbI₃ film before and after IPA treatment

	Cs (%)	Pb (%)	I (%)
Pristine film	18.1	6.64	33.65
With IPA treatment	14.74	7.86	32.96

Table S2. The (100) plane distance of $\text{CsPb}_x\text{Sb}_{1-x}\text{I}_3$ lattices with different Sb content.

Sb content	0%	2%	4%	10%
(100) plane distance(Å)	3.09	3.10	3.15	3.16