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Supporting Information

Antisolvent Solubilization Achieves Simultaneous Passivation of Shallow and Deep Defects in Perovskite Solar Cells

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Table S1. The average grain size of perovskite deposited on different perovskite films, the data calculated from the SEM images (3*3 μm).

Samples	Average crystallite size (nm)
OIHPs without AS	195.74
OIHPs with AS	265.16

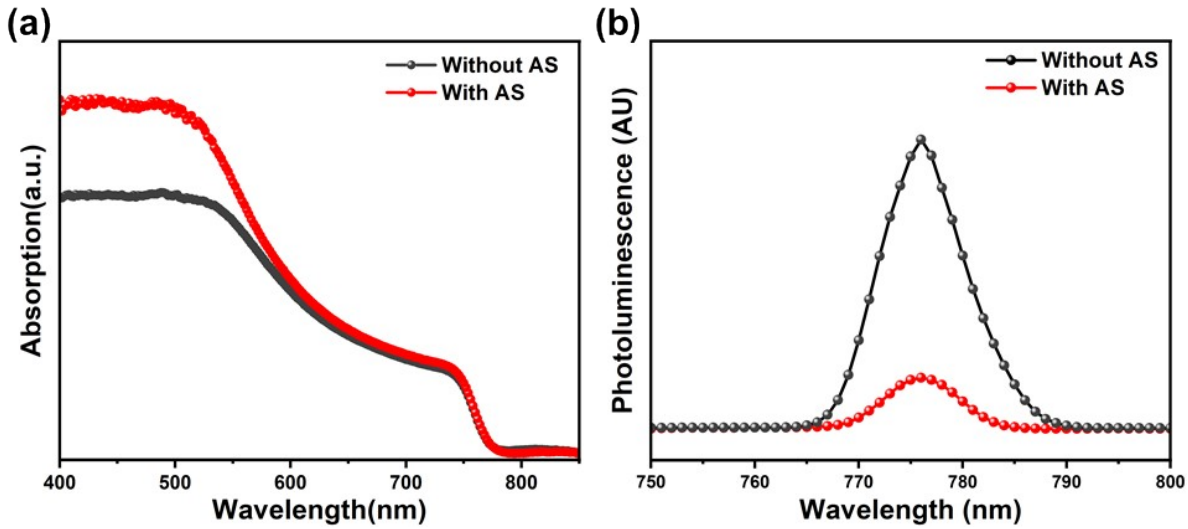

Fig. S1. (a) UV-vis spectra of the OIHPs prepared without AS and with AS method; (b) PL spectra of the OIHPs prepared without AS and with AS method on FTO/SnO_2.

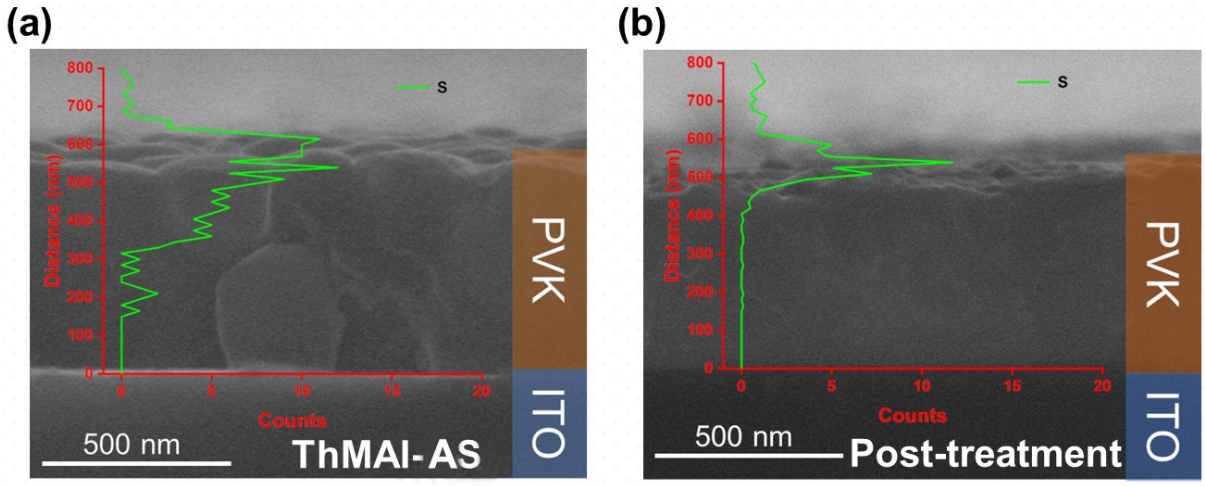

Fig. S2. Cross-section images and EDS mapping of perovskite film modified by (a) AS method and (b) post-treatment method.

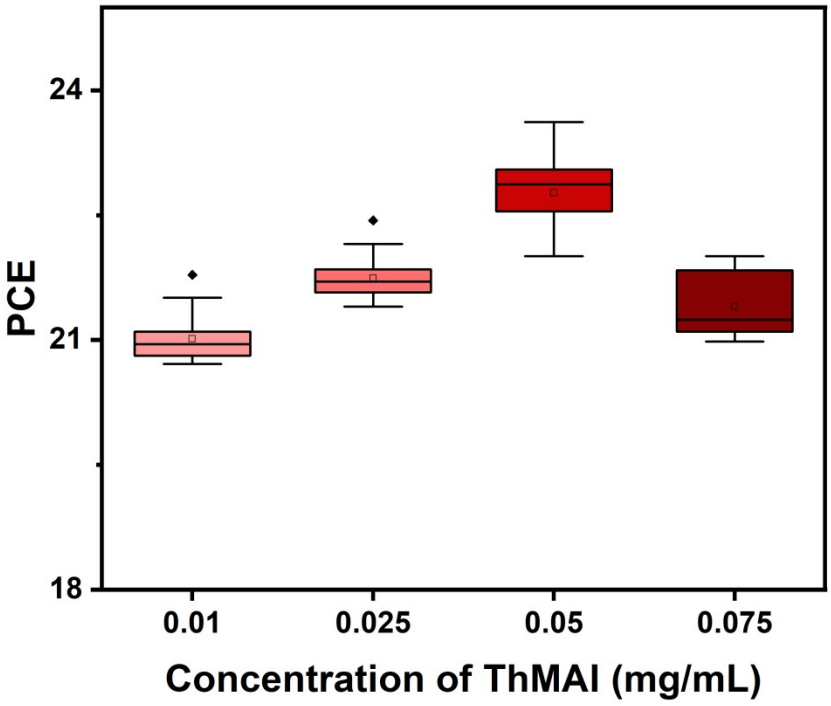

Fig. S3. Box charts of PCE of PSCs prepared with AS method varied with the concentration of ThMAI in the antisolvent Chlorobenzene.

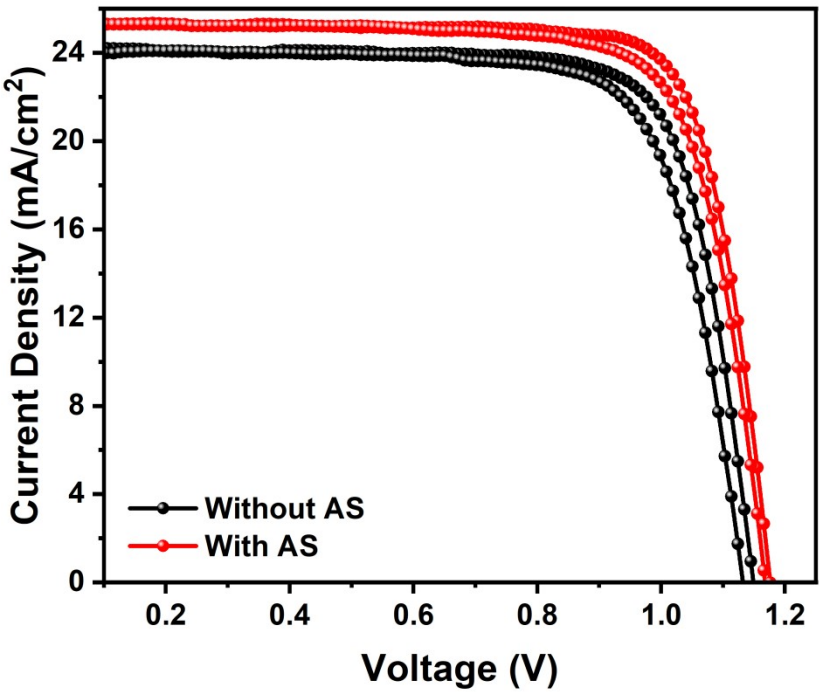

Fig. S4. J–V curves of PSCs prepared without and with AS method measured under reverse and forward scan (The test condition was that active area (0.15 cm^2) was defined by a black mask, where scan rate was 0.2 V/s for both reverse and forward scan.).

Table S2. Statistical photovoltaic parameters of PSCs (25 cells) fabricated using different methods.

Methods		V_{oc}/V	J_{sc}/mA·cm^{-}	FF	PCE/%
Withourt AS	Average	1.10±0.04	23.37±0.96	0.73±0.06	19.81±0.73
	Champion	1.14	24.21	0.78	21.53
With AS	Average	1.15±0.03	25.01±0.42	0.76±0.04	22.64±1.67
	Champion	1.17	25.31	0.80	23.69

Table S3. Carrier transport dynamics fitting results of PSCs based on different OIHPs films.

Measurements	Parameter		OIHPs without AS	OIHPs with AS
EIS	R_s	Ω	12.14	11.96
	R_{tr}	Ω	24.05	18.64
	R_{rec}	Ω	106.25	115.77
TPV	τ_L	μs	51.6	67.4
TPC	τ_t	μs	14.5	12.3

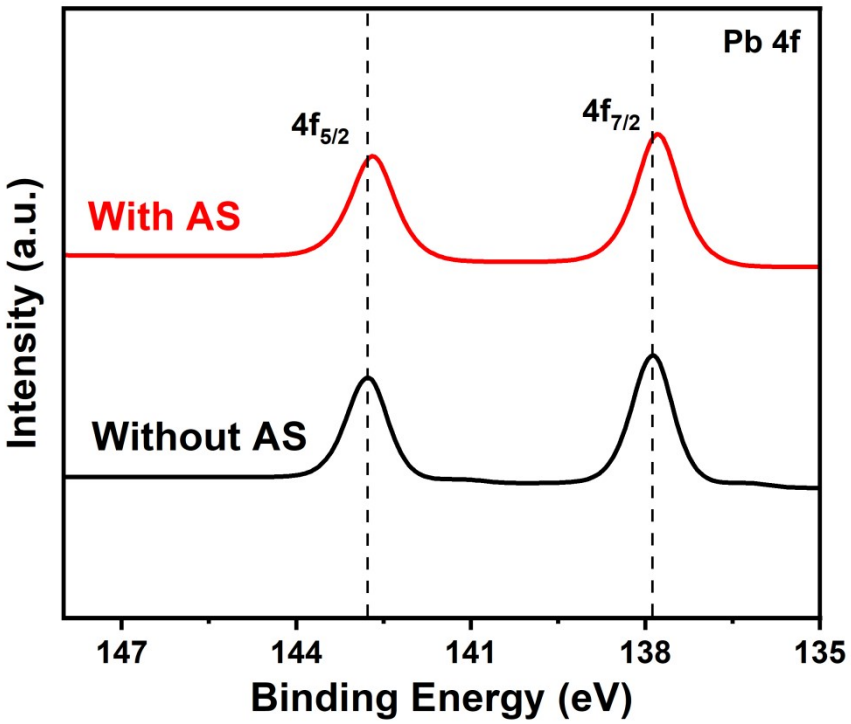

Fig. S5. Pb 4f spectra for OIHPs films prepared without and with AS method.