

Supplementary Information

Crystal Growth and Dissolution of Methylammonium Lead Iodide Perovskite in Sequential Deposition: Correlation between Morphology Evolution and Photovoltaic Performance

Tsung-Yu Hsieh, Chi-Kai Huang, Tzu-Sen Su, Cheng-You Hong and Tzu-Chien Wei *

Department of Chemical Engineering, National Tsing-Hua University, Taiwan

*Corresponding author: Tzu-Chien Wei

Tel: +886-3-5715131 ext.33669

E-mail: tcwei@mx.nthu.edu.tw

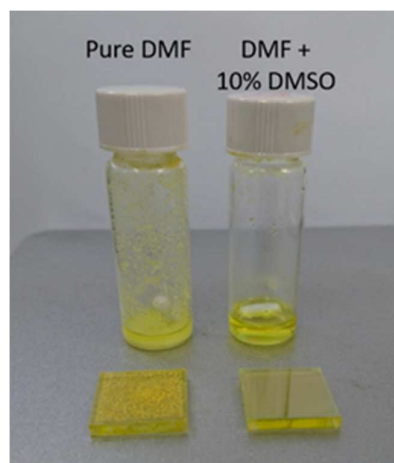


Figure S1 Photo of PbI_2 precursor solution prepared by pure (left) and 10% DMSO addition DMF (right) and corresponding spin-coated film. It can be seen that clear yellow solution can be obtained by 10% DMSO addition and the spin-coated film using this precursor solution appears uniformly yellow color, implying it is not PbI_2 -DMSO complex).

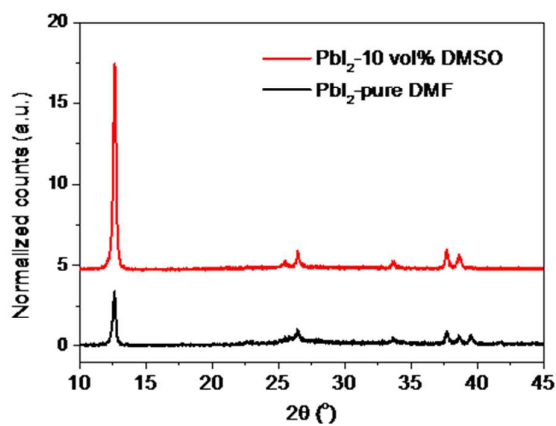


Figure S2 XRD characteristics of PbI_2 film prepared by pure DMF (black curve) and DMF/DMSO mix solvent (red curve).

Table S1. Average photovoltaic parameters in both forward and backward scan direction among 3 to 8 devices with standard deviation.

Dipping time	Scan direction	J_{SC} (mA/cm ²)	V_{OC} (V)	FF	PCE (%)
10 seconds	Forward scan	17.75 ± 0.327	1.06 ± 0.018	0.74 ± 0.004	13.89 ± 0.426
	Backward scan	17.63 ± 0.392	1.05 ± 0.027	0.73 ± 0.028	13.52 ± 1.091
1 minute	Forward scan	18.33 ± 0.315	1.06 ± 0.003	0.73 ± 0.013	14.14 ± 0.207
	Backward scan	18.27 ± 0.178	1.07 ± 0.002	0.77 ± 0.003	15.00 ± 0.168
10 minutes	Forward scan	17.75 ± 0.571	1.05 ± 0.007	0.71 ± 0.005	13.26 ± 0.394
	Backward scan	17.55 ± 0.697	1.04 ± 0.013	0.69 ± 0.012	12.59 ± 0.687
20 minutes	Forward scan	6.55 ± 3.258	0.99 ± 0.021	0.58 ± 0.096	3.61 ± 1.612
	Backward scan	5.78 ± 2.680	0.89 ± 0.110	0.54 ± 0.087	2.82 ± 1.712
1 hour	Forward scan	6.41 ± 1.137	0.90 ± 0.009	0.54 ± 0.026	3.09 ± 0.424
	Backward scan	6.19 ± 0.798	0.85 ± 0.045	0.51 ± 0.036	2.70 ± 0.616
3 hours	Forward scan	3.88 ± 0.595	0.86 ± 0.028	0.51 ± 0.021	1.70 ± 0.215
	Backward scan	3.93 ± 0.569	0.85 ± 0.087	0.52 ± 0.036	1.77 ± 0.456
8 hours	Forward scan	4.27 ± 0.350	0.74 ± 0.034	0.52 ± 0.047	1.63 ± 0.157
	Backward scan	3.65 ± 0.214	0.61 ± 0.211	0.48 ± 0.097	1.12 ± 0.511
24 hours	Forward scan	3.09 ± 0.596	0.67 ± 0.027	0.48 ± 0.054	0.98 ± 0.133
	Backward scan	2.35 ± 0.511	0.52 ± 0.114	0.44 ± 0.033	0.55 ± 0.201

