

Supporting Information

Fabrication of lead-free CsBi₃I₁₀ based compact perovskite thin films by employing solvent engineering and anti-solvent treatment techniques: An efficient photo-conversion efficiency up to 740nm

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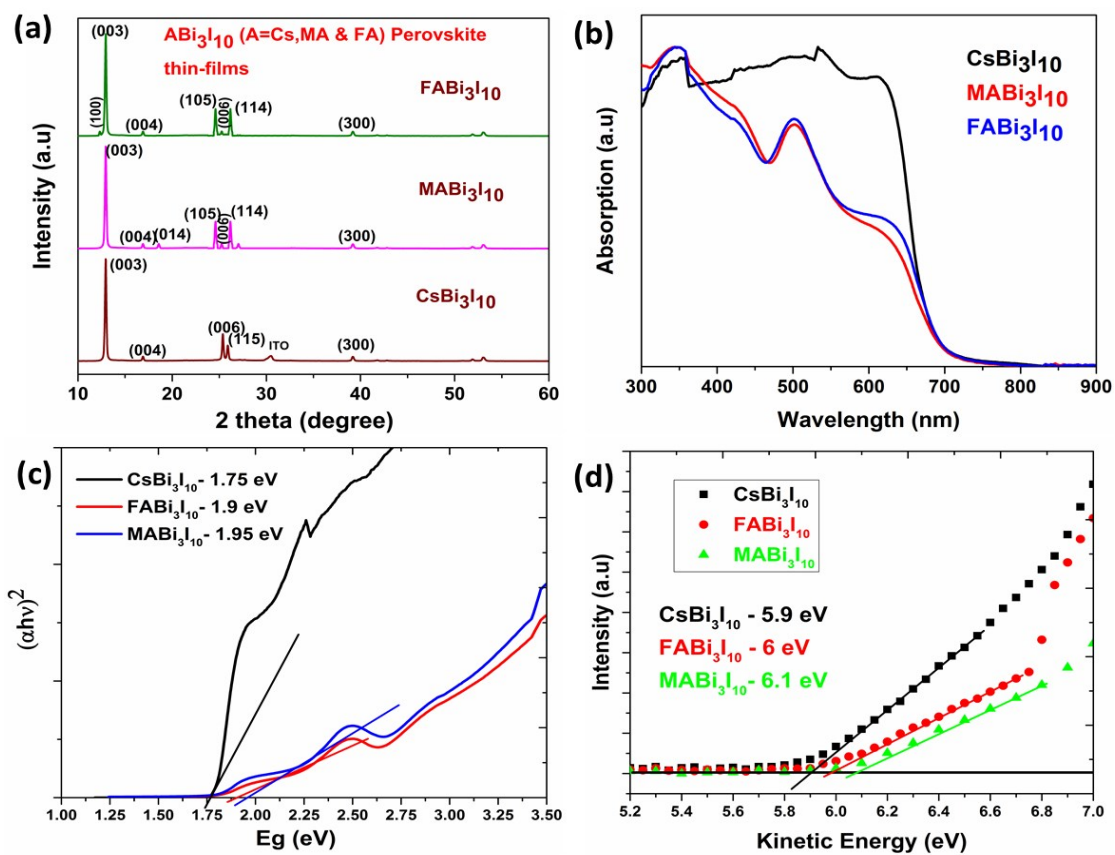


Figure S1. (a) X-Ray Diffraction pattern, (b) UV- Visible absorption spectrum, (c) Tauc plot and (d) work function measurement for the ABi₃I₁₀, (A= Cs, MA and FA) perovskite thin-films.

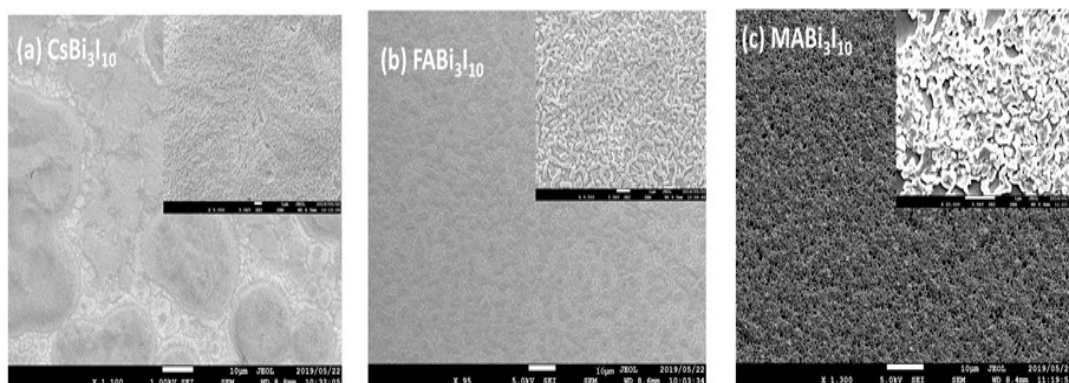


Figure S2. SEM surface images of (a) CsBi₃I₁₀, (b) FABi₃I₁₀, (c) MABi₃I₁₀ perovskite thin-films

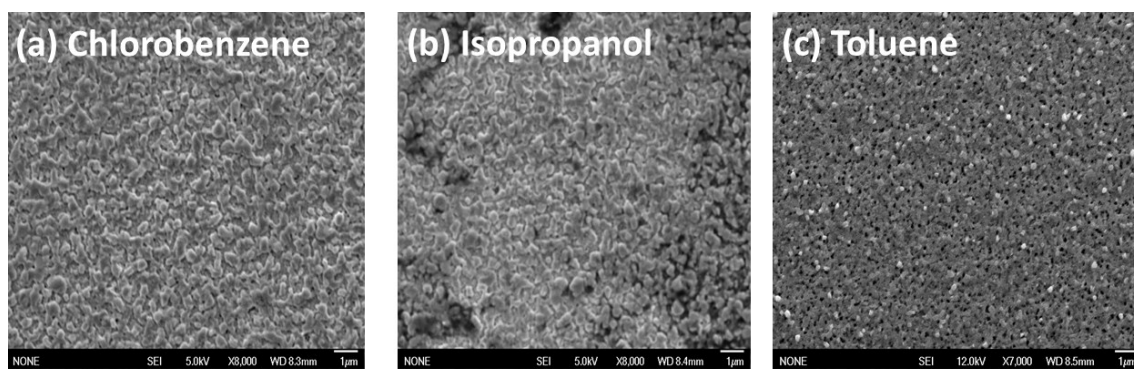


Figure S3. Higher magnification SEM surface images of (a) Chlorobenzene, (b) Isopropanol, (c) Toluene anti-solvents treated perovskite thin-films

Table ST1 : Device performance comparison of the PSCs fabricated with CsBi₃I₁₀ perovskite material as absorber.^a

Devices	J _{sc} (mA/cm ²)	V _{oc} (V)	Fill factor	η (%)
Chlorobenzene^b				
Device 1	2.200	0.651	0.271	0.38
Device 2	1.989	0.633	0.224	0.28
Device 3	1.890	0.492	0.263	0.24
Toluene^b				
Device 1	1.168	0.533	0.210	0.13
Device 2	1.224	0.439	0.180	0.10
Device 3	1.286	0.521	0.101	0.07
Isopropanol^b				
Device 1	0.818	0.377	0.230	0.07
Device 2	0.875	0.282	0.216	0.05
Device 3	0.685	0.304	0.202	0.04
Only DMF^c				
Device 1	0.440	0.279	0.227	0.03
Device 2	0.416	0.398	0.185	0.03
Device 3	0.156	0.41	0.078	0.01

^aJ-V measured in forward bias. ^b CsBi₃I₁₀ layer prepared from 7:3 (DMF:DMSO) solvent ratio and treated with different anti-solvent dripping. ^cCsBi₃I₁₀ layer prepared from only DMF solvent and without anti-solvent dripping.