Supporting information

Advancements and Prospects for eco-friendly, high-performance silver bismuth halide solar cells

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Table S1. Reported Silver Bismuth Iodide (ABI) solar cells through the previous years.

Year	ABI	Configuration	Jsc mA/cm²	V_{oc} V	FF	PCE %	Method	Solvent Antisolvent (AS)	Ref.
2016	$AgBi_2I_7$	FTO/TiO_2*/$AgBi_2I_7$/ P3HT/Au	3.3	0.56	0.674	1.22	spin coating	n-butylamine	[1]
2016	$AgBi_2I_7$	FTO/TiO_2/$AgBi_2I_7$/ P3HT/Au	4.83	0.62	0.70	2.12	spin coating	DMSO	[2]
2017	Ag_3BiI_6	FTO/TiO_2/Ag_3BiI_6/ PTAA/Au	10.7	0.63	0.64	4.3	spin coating AS: toluene	DMSO:DMF	[3]
2017	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ P3HT/Au	5.8	0.49	0.63	2.1	spin coating	butylamine	[4]
2017	$AgBi_2I_7$	FTO/TiO_2/$AgBi_2I_7$/ P3HT/Au	1.6	0.46	0.58	0.4	spin coating	butylamine	[4]
2018	$AgBiI_4$	FTO/TiO_2/AgBiI4/ PTAA/Au	3.7	0.63	0.514	1.2	spin coating	DMSO:DMF (1:1) AS: chlorobenze	[5]
2018	$AgBiI_4$	FTO/TiO_2/$AgBiI_4$/ PTAA/Au	5.24	0.67	0.621	2.2	dynamic hot casting	DMSO:DMF (1:1) AS: chlorobenze	[5]
2018	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5 /PTAA/Au	4.42	0.63	0.576	1.6	spin coating	DMSO:DMF (1:1) AS: chlorobenze	[5]
2018	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ PTAA/Au	6.04	0.69	0.624	2.6	dynamic hot casting	DMSO:DMF (1:1) AS: chlorobenze	[5]
2018	Ag_3BiI_6	FTO/TiO_2/Ag_3BiI_6/ PTAA/Au	11.2	0.607	0.646	4.33	Ar air blowing spin coating	DMSO:DMF:HI (3:1)	[6]
2018	$AgBiI_4$	FTO/TiO_2/$AgBiI_4$/ PTAA/Au	8.07	0.562	0.523	2.36	Ar air blowing spin coating	DMSO:DMF:HI (3:1)	[6]
2018	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5 /PTAA/Au	8.9	0.522	0.681	3.16	Ar air blowing spin coating	DMSO:DMF:HI (3:1)	[6]
2018	$AgBi_2I_7$	FTO/TiO_2/$AgBi_2I_7$/ PTAA/Au	5.8	0.599	0.597	2.09	Ar air blowing spin coating	DMSO:DMF:HI (3:1)	[6]
2018	Other	FTO/TiO_2/$Ag_3BiI_{5.92}S_{0.04}$/PTAA/Au	14.7	0.573	0.659	5.56	Ar air blowing spin coating	DMSO:DMF:HI (3:1)	[6]
2018	Other	FTO/TiO_2/$AgBiI_{3.92}S_{0.04}$/PTAA/Au	9.46	0.527	0.55	2.75	Ar air blowing spin coating	DMSO:DMF:HI (3:1)	[6]
2018	Other	FTO/TiO_2/$Ag_2BiI_{4.92}S_{0.04}$/PTAA/Au	13.1	0.479	0.624	3.91	Ar air blowing spin coating	DMSO:DMF:HI (3:1)	[6]
2018	Other	FTO/TiO_2/$AgBi_2I_{6.92}S_{0.04}$/PTAA/Au	7.68	0.569	0.566	2.48	Ar air blowing spin coating	DMSO:DMF:HI (3:1)	[6]
2019	$AgBiI_4$	ITO/SnO_2/$AgBiI_4$/ PTAA/Au	4.26	0.66	0.591	1.67	spin coating	DMSO:DMF (4:1)	[7]
2019	$AgBiI_4$	ITO/SnO_2/$AgBiI_4$:Li -TFSI2%/PTAA/Au	5.07	0.83	0.665	2.8	spin coating	DMSO:DMF (4:1)	[7]
2020	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ PTB7/MoO_x/Ag	3.77	0.49	0.59	1.26	spin coating	DMSO:HI (5%vol)	[8]
2020	Ag_2BiI_5	FTO/TiO2/Ag_2BiI_5/ PTB7/MoOx/Ag	2.64	0.59	0.37	0.78	spin coating	DMSO	[8]
2020	Other	FTO/TiO_2/ Ag-(Bi-Sb)-I (3:1:1:9)/PTB7/ MoO_x/Ag	6.05	0.52	0.58	1.82	spin coating	DMSO	[8]
2020	$AgBi_2I_7$	FTO/TiO_2/$AgBi_2I_7$/ PTB7/MoO_x/Ag	0.91	0.67	0.51	0.31	spin coating	DMSO:DMF (1:1)	[9]

2020	Other	FTO/TiO_2/ $AgBi_{1.5}Sb_{0.5}I_7$/PTB7/ MoO_x/Ag	2.27	0.57	0.43	0.56	spin coating	DMSO:DMF (1:1)	[9]
2020	Other	FTO/TiO_2/ $AgBiSbI_7$/PTB7/ MoO_x/Ag	2.11	0.55	0.5	0.58	spin coating	DMSO:DMF (1:1)	[9]
2020	Other	FTO/TiO_2/ $AgBi_{0.5}Sb_{1.5}I_7$/PTB7/ MoO_x/Ag	5.66	0.53	0.59	1.76	spin coating	DMSO:DMF (1:1)	[9]
2020	Ag_3BiI_6	FTO/TiO_2/Ag_3BiI_6/ NiO/Au	0.36	0.65	0.33	0.08	DC Sputtering	-	[10]
2020	Ag_3BiI_6	ITO/NiO_x/Ag_3BiI_6/ PCBM/C60/Au	1.08	0.77	0.37	0.31	spin coating	n-butylamine	[11]
2020	Ag_3BiI_6	ITO/NiO_x/Ag_3BiI_6/ PCBM/C60/Au	1.73	0.82	0.76	1.08	dynamic spin coating	n-butylamine	[11]
2020	Other	FTO/TiO_2/$Ag_3Bi_2I_9$/ PDBD-T/Au	4.9	0.7	0.578	1.97	spin coating	DMSO	[12]
2020	Other	FTO/TiO_2/ $0.5Cs_3Bi_2I_9$-$Ag_3Bi_2I_9$/ PDBD-T/Au	7.65	0.78	0.601	3.59	spin coating	DMSO	[12]
2021	Ag_2BiI_5	FTO/c-TiO_2/ Ag_2BiI_5/Carbon	1.67	0.595	0.42	0.42	air blowing	DMSO:DMF (1:4)	[13]
2021	Ag_2BiI_5	FTO/c-TiO_2/ Ag_2BiI_5/Carbon	1.96	0.77	0.41	0.71	air blowing	DMSO:DMF (1:4)	[13]
2021	Ag_3BiI_6	FTO/TiO_2/Ag_3BiI_6/ P3HT/Au	5.12	0.58	0.61	1.8	spin coating	DMSO AS: chlorobenzene	[14]
2021	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ P3HT/Au	5.65	0.54	0.67	2.04	spin coating	DMSO AS: chlorobenzene	[14]
2021	$AgBi_2I_7$	FTO/TiO_2/$AgBi_2I_7$/ P3HT/Au	5.05	0.56	0.74	2.1	spin coating	DMSO AS: chlorobenzene	[14]
2021	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ Spiro-OMeTAD/Au	1.51	0.4	0.415	0.25	spin coating	DMF	[15]
2021	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ Spiro-OMeTAD/Au	2.25	0.48	0.498	0.54	spin coating	DMSO:DMF (1:3)	[15]
2021	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ Spiro-OMeTAD/Au	2.31	0.49	0.545	0.62	spin coating	DMSO:DMF (1:1)	[15]
2021	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ Spiro-OMeTAD/Au	2.2	0.47	0.501	0.52	spin coating	DMSO:DMF (3:1)	[15]
2021	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ Spiro-OMeTAD/Au	2.13	0.46	0.505	0.49	spin coating	DMSO	[15]
2021	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ PTAA/Ag	6.04	0.602	0.561	2.04	spin coating	DMSO:DMF (3:2) AS: ethyl ether	[16]
2021	Other	FTO/TiO_2/ $Ag_{1.95}Cu_{0.05}BiI_5$/ PTAA/Ag	7.13	0.619	0.573	2.53	spin coating	DMSO:DMF (3:2) AS: ethyl ether	[16]
2021	Other	FTO/c-TiO_2/ $Ag_2Bi_3I_{11}$/P3HT/Au	2.65	0.34	0.49	0.44	spin coating	DMSO:DMF:HI	[17]
2021	Other	FTO/c-TiO_2/ $Ag_2Bi_3I_{11}$/Blue dye/P3HT/Au	4.98	0.52	0.58	1.5	spin coating	DMSO:DMF:HI	[17]
2022	Ag_3BiI_6	FTO/TiO_2/Ag_3BiI_6 /PTAA/Ag	5.34	0.71	0.623	2.36	spin coating	DMSO AS: chlorobenzene	[18]
2022	$AgBiI_4$	ITO/SnO_2/$AgBiI_4$/ PTAA/Au	2.77	0.47	0.5	0.64	spin coating	DMSO:DMF (1:1)	[19]
2022	$AgBiI_4$	ITO/SnO_2/$AgBiI_4$/ PTAA/Au	3.44	0.53	0.52	0.94	spin coating	DMSO:DMF (1:1) AS: chlorobenzene	[19]

2022	$AgBiI_4$	ITO/SnO_2/$AgBiI_4$/ PTAA/Au	3.58	0.53	0.58	1.11	spin coating	DMSO:DMF (1:1) AS: toluene	[19]
2022	$AgBiI_4$	ITO/SnO_2/$AgBiI_4$/ PTAA(Li-TFSI)/Au	3.89	0.58	0.56	1.26	spin coating	DMSO:DMF (1:1) AS: IPA	[19]
2023	Ag_2BiI_5	ITO/SnO_2/Ag_2BiI_5/ PTAA/Au	4.47	0.81	0.55	2.01	spin coating	DMSO:DMF (1:3)	[20]
2023	Ag_3BiI_6	ITO/TiO_2/Ag_3BiI_6/ PTAA(Li-TFSI)/Ag	6.44	0.7	0.617	2.77	doctor blade	DMSO	[21]
2023	$AgBi_2I_7$	FTO/TiO_2/$AgBi_2I_7$/ Spiro-OMeTAD/Au	3.07	0.65	0.48	0.96	spin coating	DMF:MeOH (1:1)	[22]
2023	$AgBi_2I_7$	FTO/TiO_2/$AgBi_2I_7$/ PTB7/Au	2.41	0.71	0.551	0.94	spin coating	n-butylamine	[23]
2024	$AgBiI_4$	FTO/TiO_2/$AgBiI_4$/ P3HT/Carbon	4.41	0.67	0.520	1.04	spin coating	DMSO:DMF (4:1)	[24]
2024	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ Carbon	3.63	0.63	0.407	0.93	melt-solidification	DMSO:DMF (4:1)	[25]
2024	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ Carbon	3.99	0.64	0.482	1.22	melt-solidification	DMSO:DMF (3:1)	[26]
2024	Ag_2BiI_5	FTO/TiO_2/Ag_2BiI_5/ Spiro-OMeTAD/Au	3.71	0.63	0.564	1.32	spin coating	DMSO	[27]
2024	$AgBiI_4$	FTO/TiO_2/$AgBiI_4$/ PEDOT:PSS/Ag	2.82	0.44	0.44	0.84	spin coating	DMSO:DMF (1:3) AS: toluene	[28]
2024	$AgBiI_4$	ITO/SnO_2/ $AgBiI_4$/ PTAA/Ag	2.99	0.78	0.577	1.87	spin coating	DMSO:DMF (1:1) AS: IPA	[29]

*: TiO_2 stands by c-TiO_2/m-TiO_2 if is not clarified.

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