Supporting Information

Tuning Solvent Co-ordination in Cs_2SnI_6 Perovskite Solution via Co-Solvent Dilution Strategy for Energy-Efficient Broadband Photodetector Arrays

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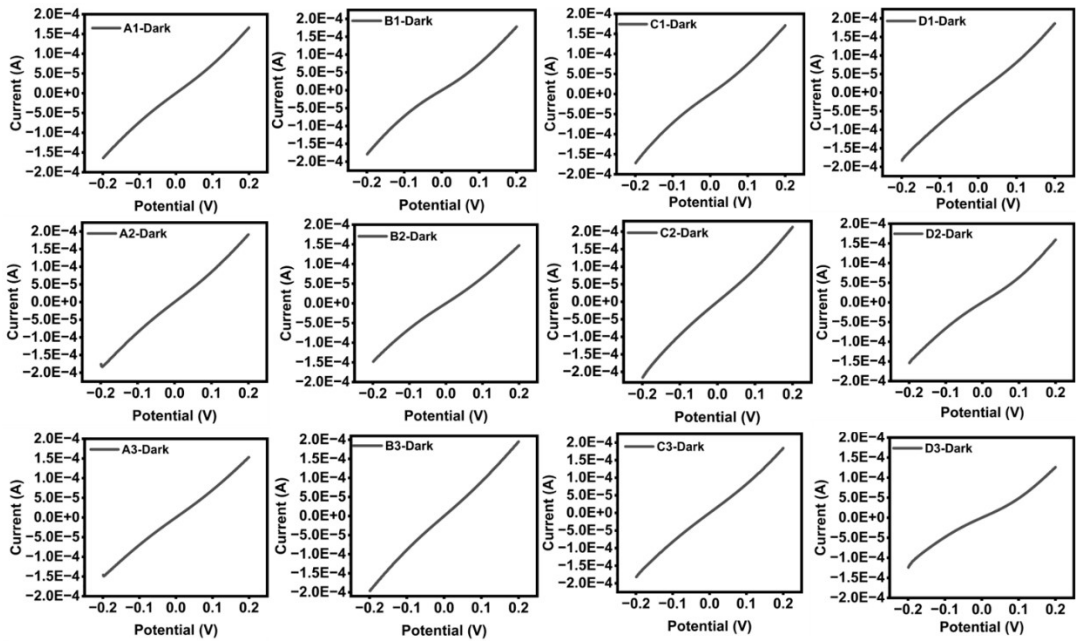

Figure S1. I-V dark curves of 4×3 Cs_2SnI_6 PD arrays biased from -0.2 V and 0.2 V.

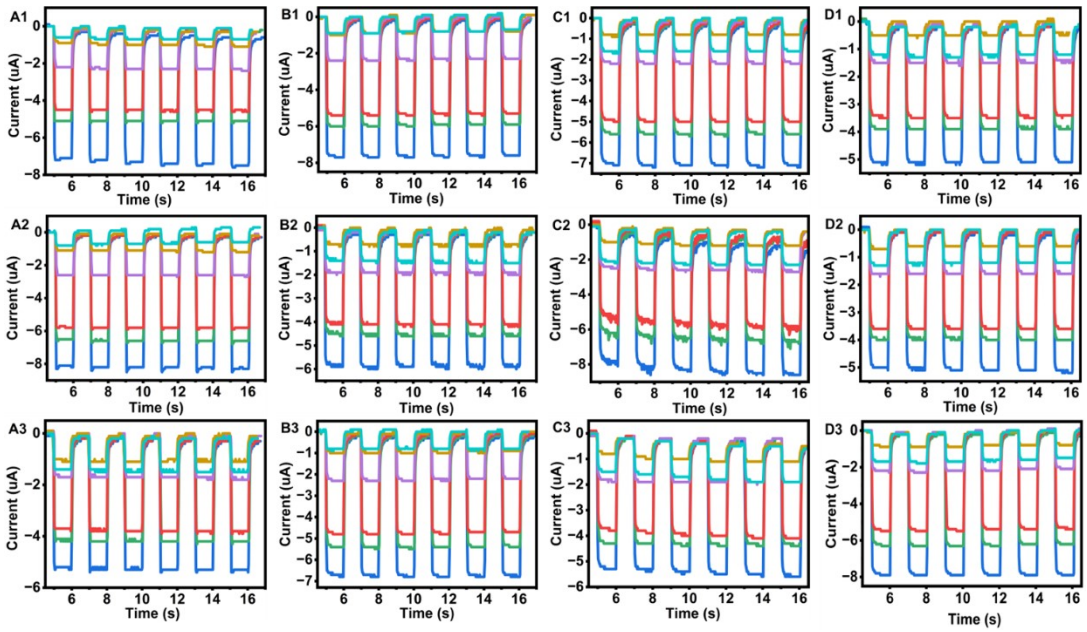

Figure S2. Dynamic photo response of 4×3 Cs_2SnI_6 photodetector arrays under illumination ranging from Vis to NIR.

Table S1. Rise-fall time of Cs_2SnI_6 PD prepared with 19 vol% D-water dilution under illumination ranging from Vis to NIR**.**

Wavelength (nm)	Rise Time (s)	Fall Time (s)
470	0.045	0.072
550	0.085	0.072
650	0.045	0.045
780	0.045	0.070
850	0.035	0.070
890	0.063	0.070

Table S2. The average photoelectric values derived from 12 devices prepared with 19 vol% D-water dilution under bias voltage -0.1V and illumination ranging from 470 to 890 nm.

Wavelength/Electrical parameters	470nm	550nm	650nm	780nm	850nm	890nm
Responsivity (A/W)	2.46	3.54	4.46	4.13	2.79	0.81
Detectivity (10^{10} Jones)	1.96	2.81	3.49	3.28	2.23	0.69
Net-Photocurrent (μA)	6.07	4.77	4.22	1.85	0.74	1.16
Incident power intensity of light (mW/cm)	1.64	0.897	0.630	0.299	0.175	0.900

Table S3. Summary of Cs_2SnI_6 perovskite-based photodetectors.

Process	Key strategy	Bias voltage	Responsivity A/W	Detectivity (Jones)	T_r/T_f	Ref
Spin coating	Co-solvent strategy	-0.1 V	5.5	5.51×10^{10}	0.045s /0.045s	Present work
Spin coating	Stoichiometry, and annealing optimization	1V	0.006	2×10^{9}	-	[1]
Spin coating	Polyethylene glycol dimethacrylate	1V	3.5	6×10^{10}	-	[2]
Spin coating	Precursor-compensation strategy	0V	0.00107	6.03×10^{10}	0.59s /1.90s	[3]
Hydrothermal	Longer processing time (>11 hours)	5V	11.96	1.21×10^{11}	16ms /22ms	[4]
Hot injection	Solvent engineering	-5V	0.12	10^{13}	2s/25s	[5]
Hot injection	Perovskite/ZnO heterojunction	15V	0.1834	1.39×10^{12}	4.3μs /5.3μs	[6]
Liquid−liquid interface	Ni doping	1V	1634	4.52×10^{12}	150ms /390ms	[7]
	Zn doping	1V	710	1.56×10^{13}	320ms /830ms	

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