Electronic Supplementary Information

GeSe-Evoked Synchronous Strategy for Electrodeposited CZGSe Solar Cells

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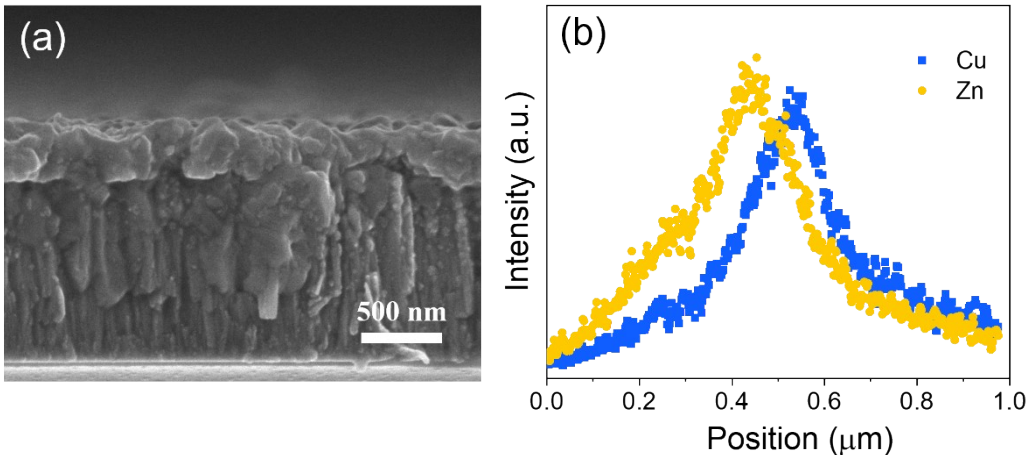

Figure S1. (a) Cross-sectional SEM image and (b) EDX line profiles of the preformed Cu-Zn layer.

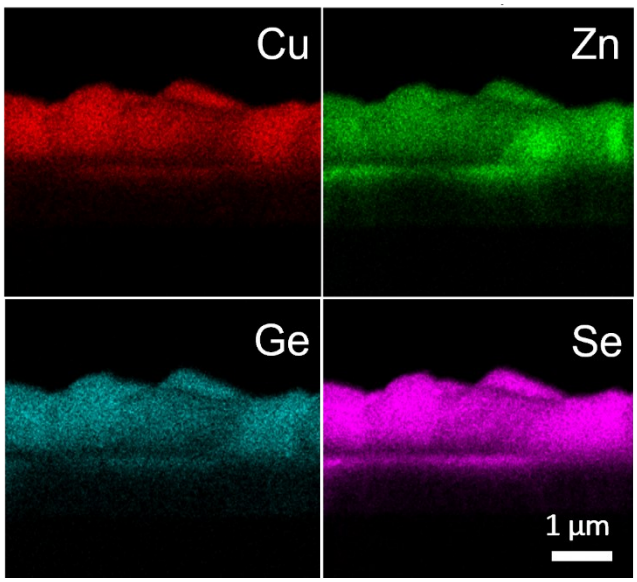

Figure S2. EDX mappings of the CZGSe-B absorber layer.

Table S1. Elemental composition of CZGSe-A and CZGSe-B absorber layer.

Samples	Cu (%)	Zn (%)	Ge (%)	Se (%)	Cu/Zn+Ge	Zn/Ge
CZGSe-A	23.06	13.61	11.13	52.20	0.93	1.22
CZGSe-B	19.91	15.92	13.59	50.58	0.67	1.17

Table S2. Device parameters of the CZGSe-A and CZGSe-B solar cells prepared at different selenized temperatures.

Device	Temperature (°C)	V_{OC} (mV)	J_{SC} (mA/cm²)	FF (%)	Eff (%)
CZGSe-A	480	400	8.28	33.81	1.11
	500	0.43	14.66	33.78	2.14
	520	370	8.58	32.03	1.02
CZGSe-B	580	0.45	10.82	45.50	2.21
	600	0.49	16.53	45.57	3.69
	620	0.31	10.55	39.35	1.29

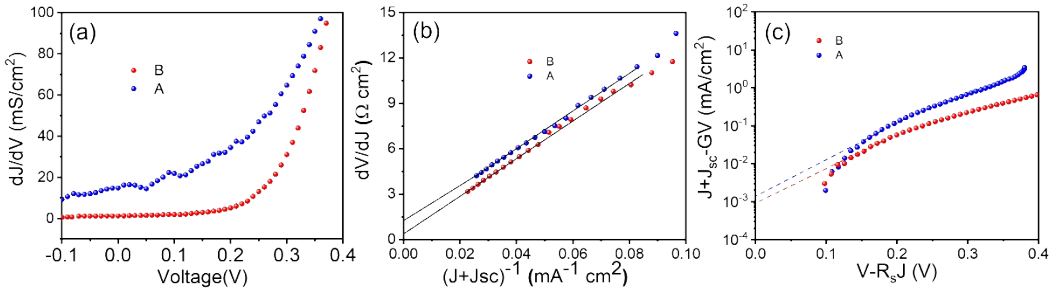

Figure S3. Plots of dJ/dV vs V (a), dV/dJ versus (J+Jsc)$^{-1}$(b), J+J_{sc}-GV vs V-R$_s$$J$ (c) extracted from the light J–V curves, respectively.