

## Supporting information

# Morphological evolution of individual microrods to self-assembled 3D hierarchical flower architectures of $\text{CuBi}_x\text{In}_{1-x}\text{Se}_2$ for photo response application

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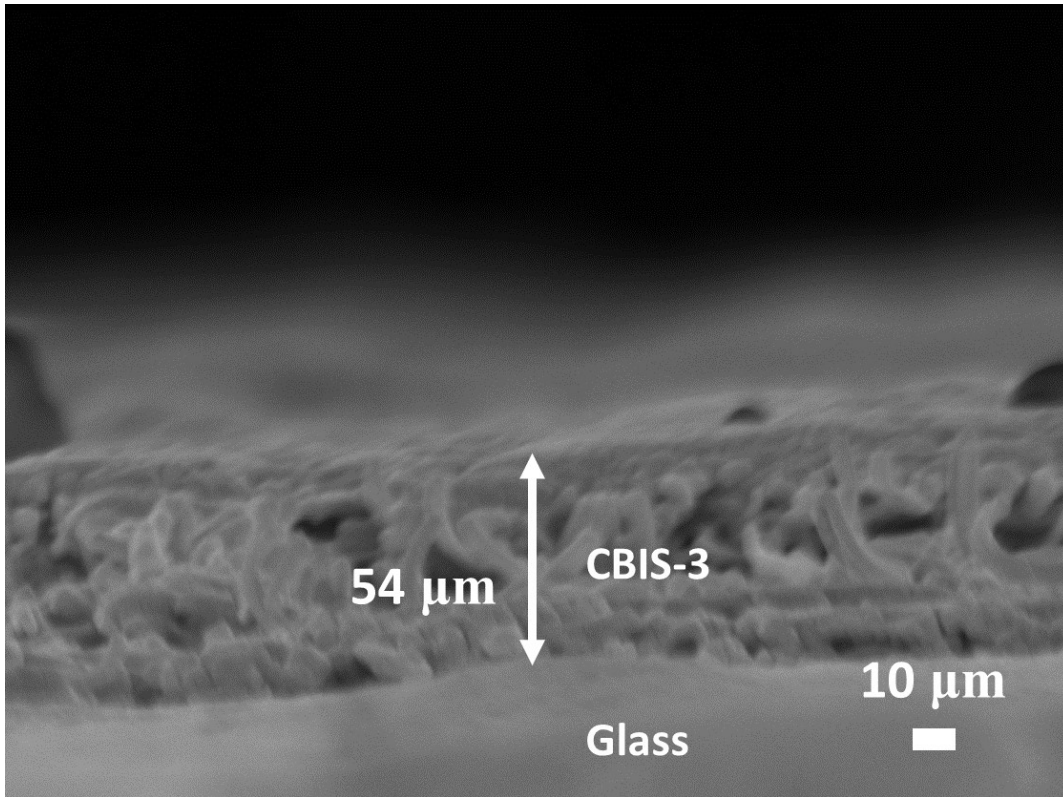
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**Fig. S1.** Cross-sectional SEM image of CBIS-3 sample film for current-voltage measurement.

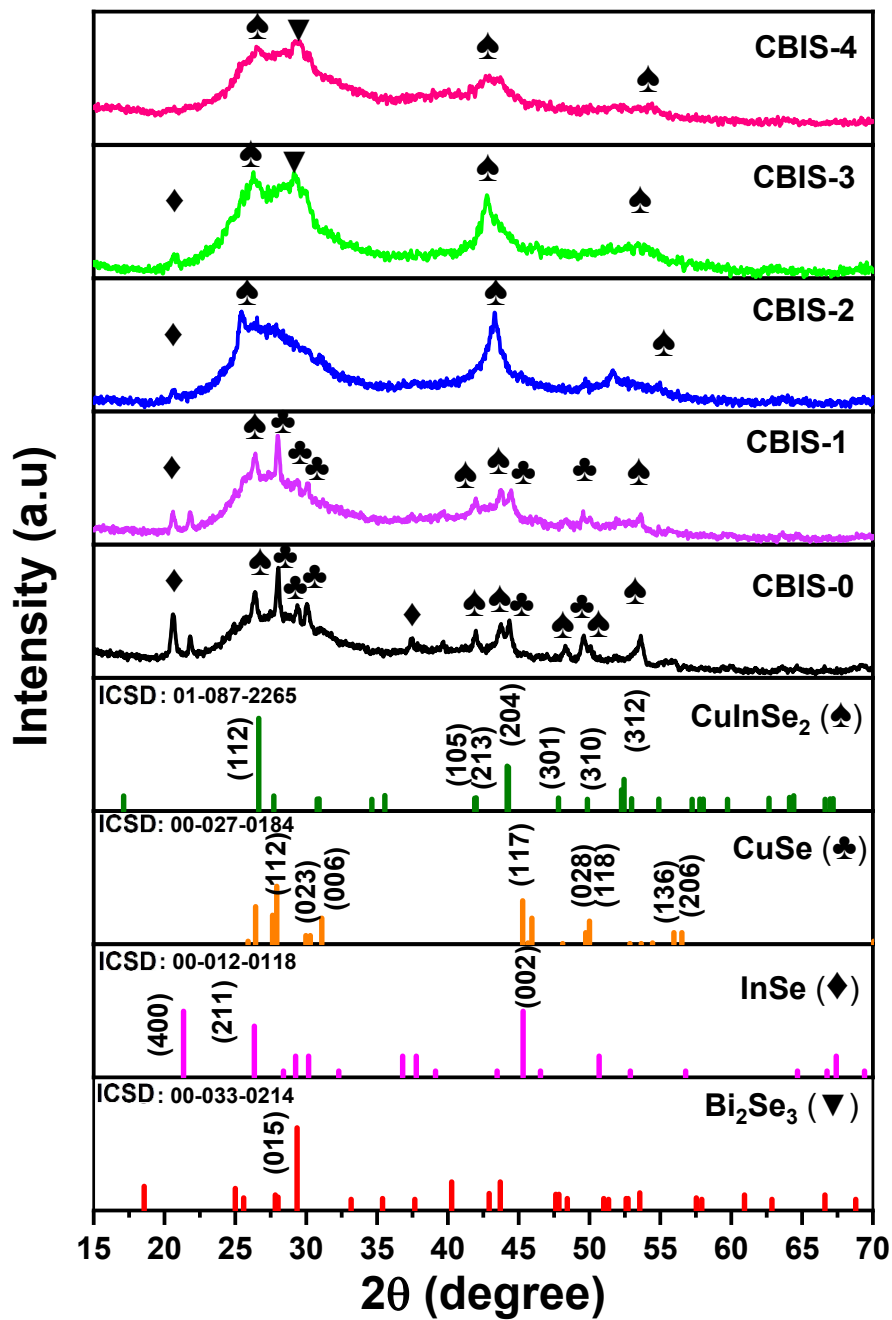


Fig. S2. XRD pattern of all CBIS MFs.

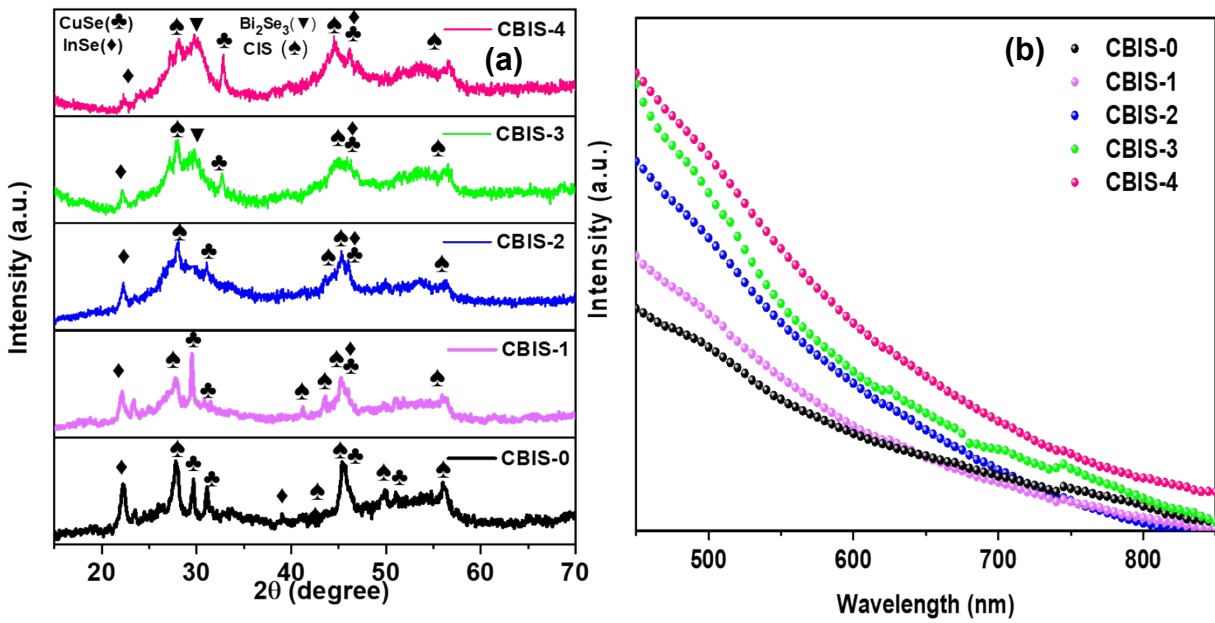
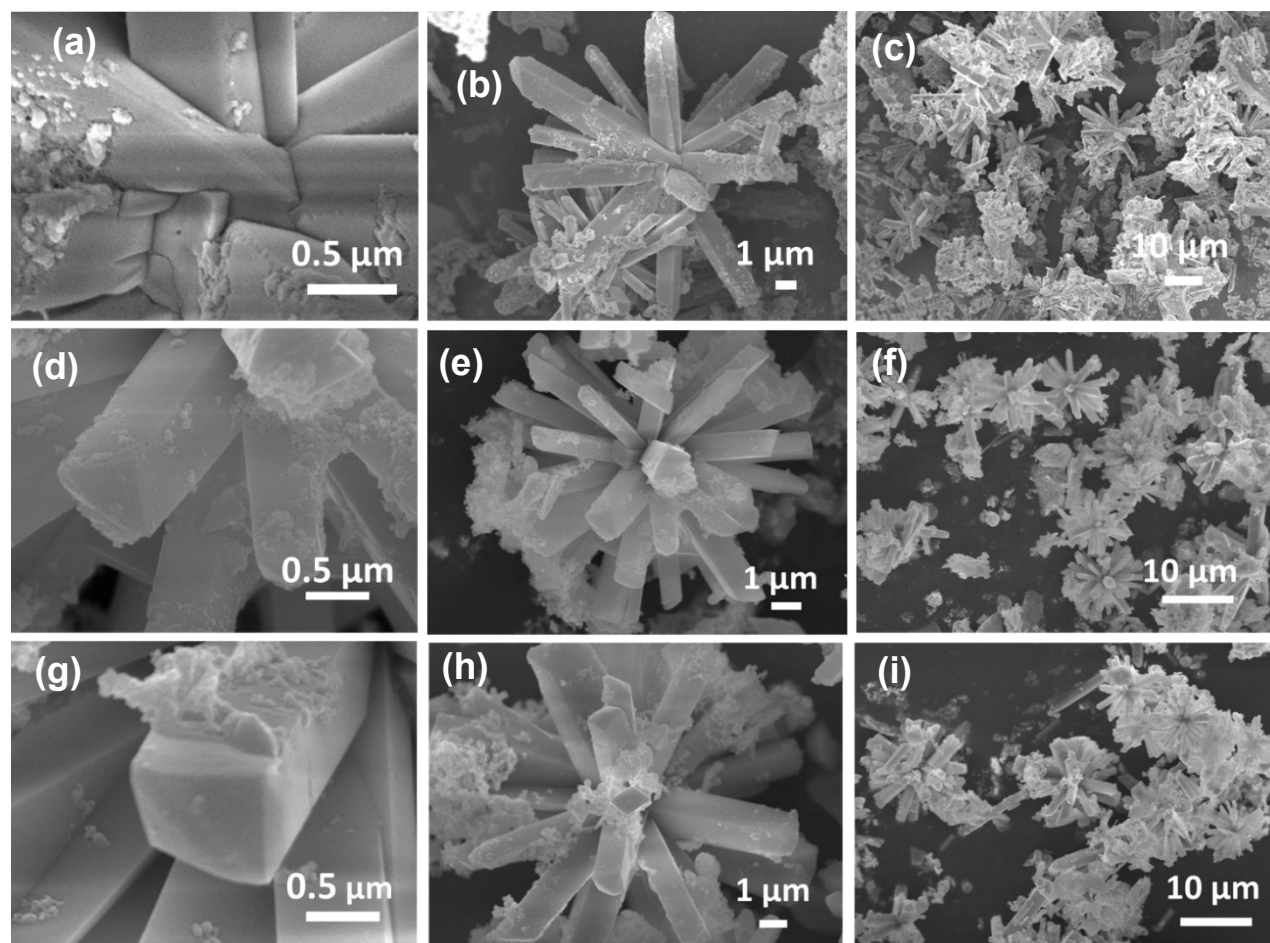
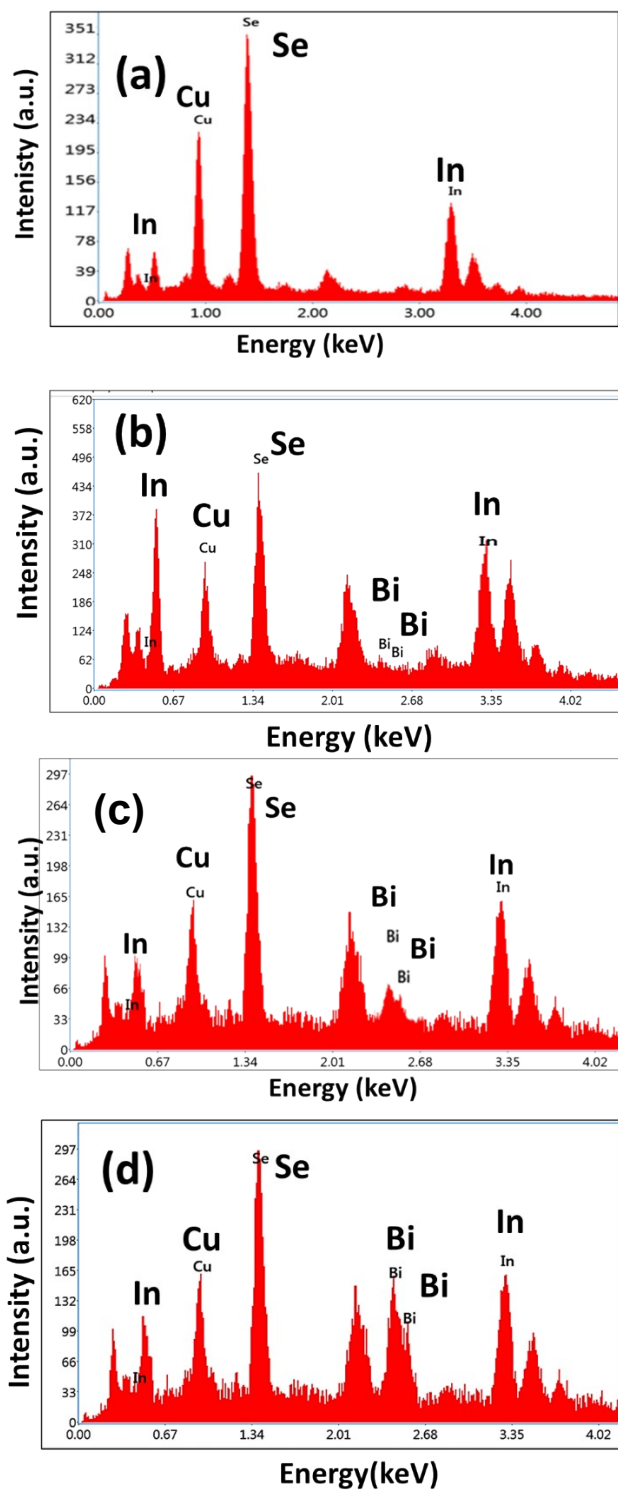


Fig. S3. (a) XRD pattern, (b) absorption spectra of reproduced samples.



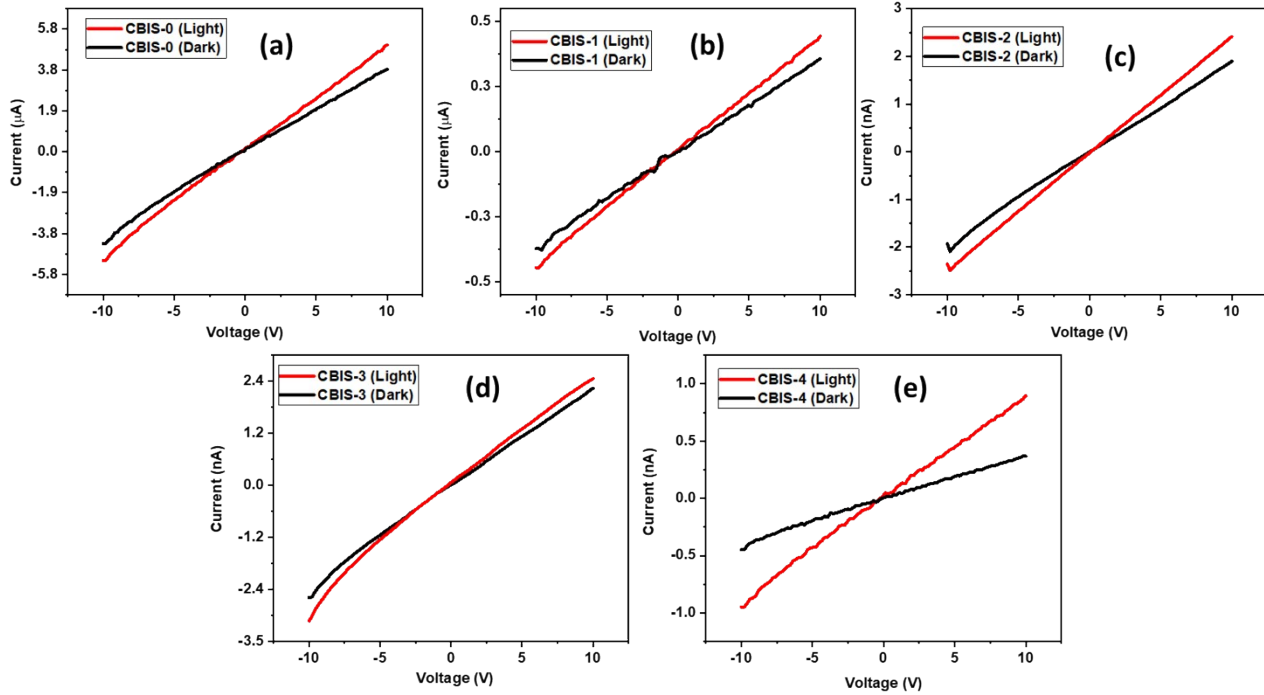
**Fig. S4.** FESEM images of (a, b, c) CBIS-1, (d, e, f) CBIS-3, and (g, h, i) CBIS-4 for three different magnifications.



**Fig. S5.** EDX spectra of (a) CBIS-0, (b) CBIS-1, (c) CBIS-3, and (d) CBIS-4 samples.

**Table S1.** Elemental composition variation comparison of different CBIS MFs.

<b>Sample</b>	<b>CBIS-0</b>			<b>CBIS-1</b>			<b>CBIS-2</b>			<b>CBIS-3</b>			<b>CBIS-4</b>		
<b>Elements</b>	<b>EDX</b>	<b>XPS</b>	<b>ICP-MS</b>	<b>EDX</b>	<b>XPS</b>	<b>ICP-MS</b>	<b>EDX</b>	<b>XPS</b>	<b>ICP-MS</b>	<b>EDX</b>	<b>XPS</b>	<b>ICP-MS</b>	<b>EDX</b>	<b>XPS</b>	<b>ICP-MS</b>
<b>Cu</b>	24.12	23.41	-	25.13	-	-	24.51	-	-	24.97	-	-	25.76	25.12	25.55
<b>Se</b>	50.27	51.65	-	49.87	-	-	50.54	-	-	49.98	-	-	48.91	49.46	47.77
<b>In</b>	25.61	24.94	-	19.76	-	-	15.07	-	-	9.89	-	-	5.66	4.96	4.99
<b>Bi</b>	0	0	-	5.33	-	-	9.88	-	-	15.16	-	-	19.67	20.54	21.81
<b>Total</b>	100	100	-	100	-	-	100	-	-	100	-	-	100	100	100

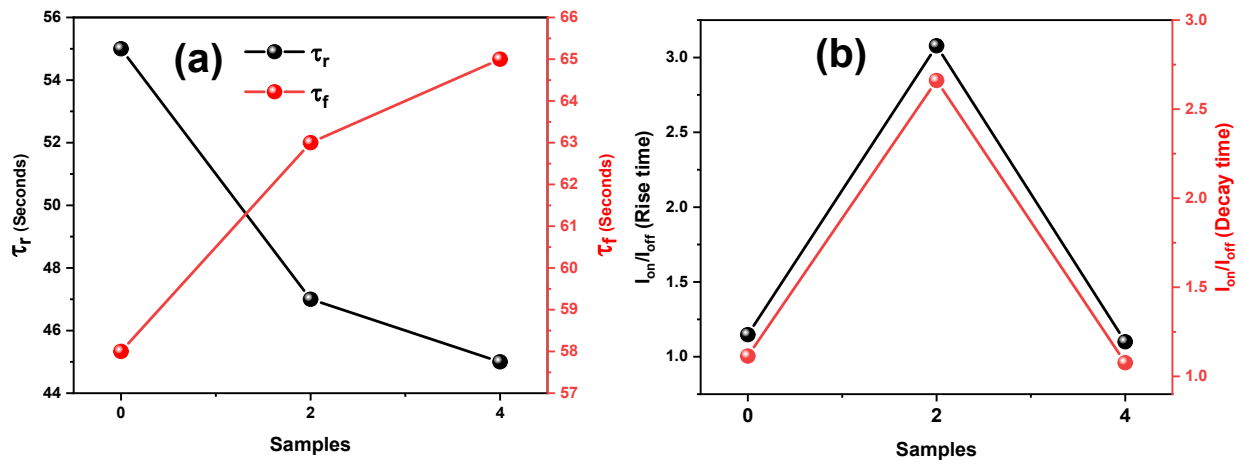


**Fig. S6.** Current-voltage variation graph of reproduced samples.

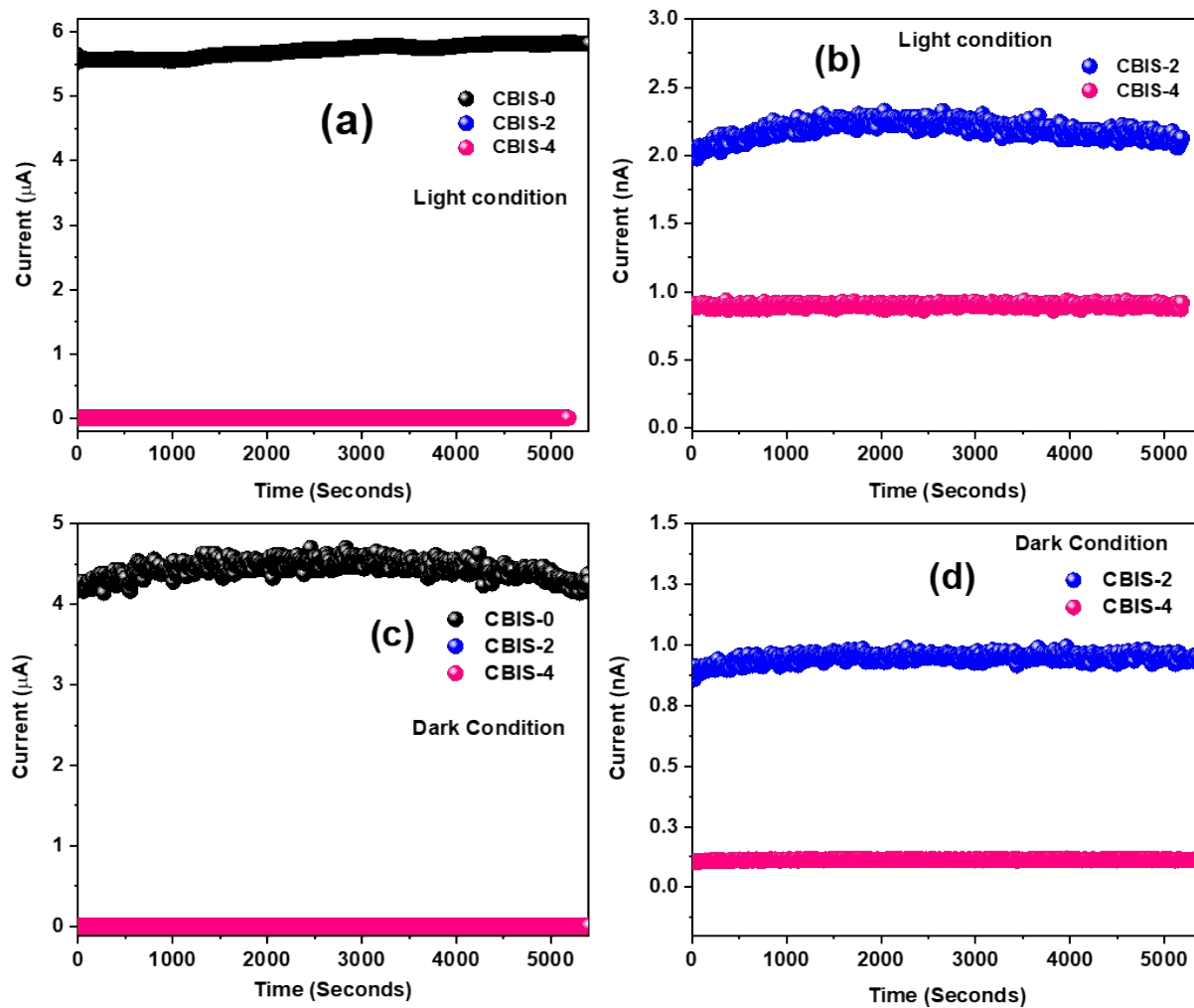


**Table S2.**  $I_{on}$  and  $I_{off}$  and response time values for CBIS-0, CBIS-2, and CBIS-4 samples.

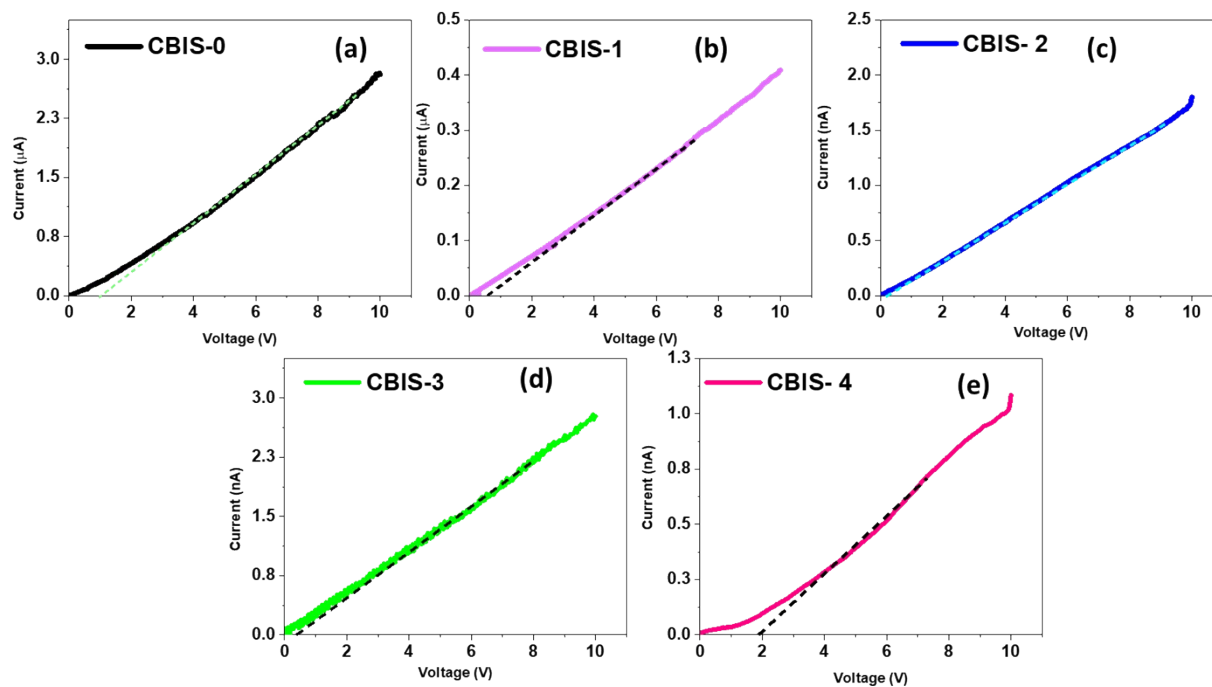
<b>Sample</b>	<b><math>I_{on}</math></b>	<b><math>I_{off}</math> (Rise time)</b>	<b><math>I_{off}</math> (Fall time)</b>	<b><math>\tau_r</math>(sec)</b>	<b><math>\tau_f</math>(sec)</b>
CBIS-0	5.77 $\mu$ A	5.03 $\mu$ A	5.18 $\mu$ A	55	58
CBIS-2	1.57 nA	0.51 nA	0.59 nA	47	63
CBIS-4	0.99 nA	0.90 nA	0.92 nA	45	65



**Fig. S7.** (a) Rise and fall time variation and (b)  $I_{on}/I_{off}$  and (c)  $I_{on}/I_{off}$  ratio of studied samples.



**Fig. S8.** Photocurrent stability under (a,b) light and (c,d) dark conditions of CBIS-0, CBIS-2, and CBIS-4 samples.



**Fig. S9.** Evaluation of resistance of all CBIS samples in the presence of light.