

Supporting Information

2D Hexagonal $\text{CuBi}_x\text{Ga}_{1-x}\text{Se}_2$ Nanosheets for Visible Light Photodetector

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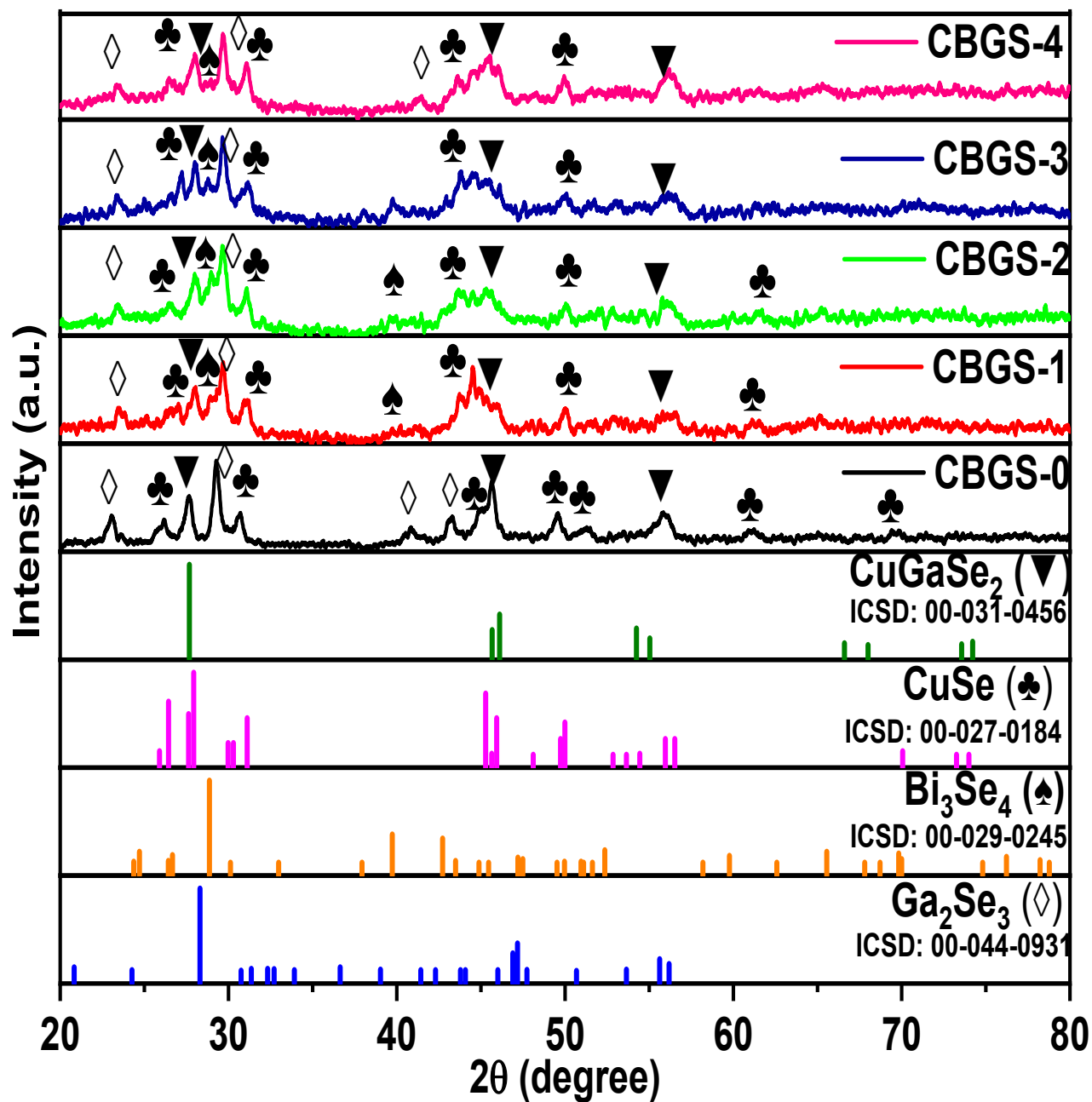


Figure S1. XRD pattern of all CBGS HNS samples.

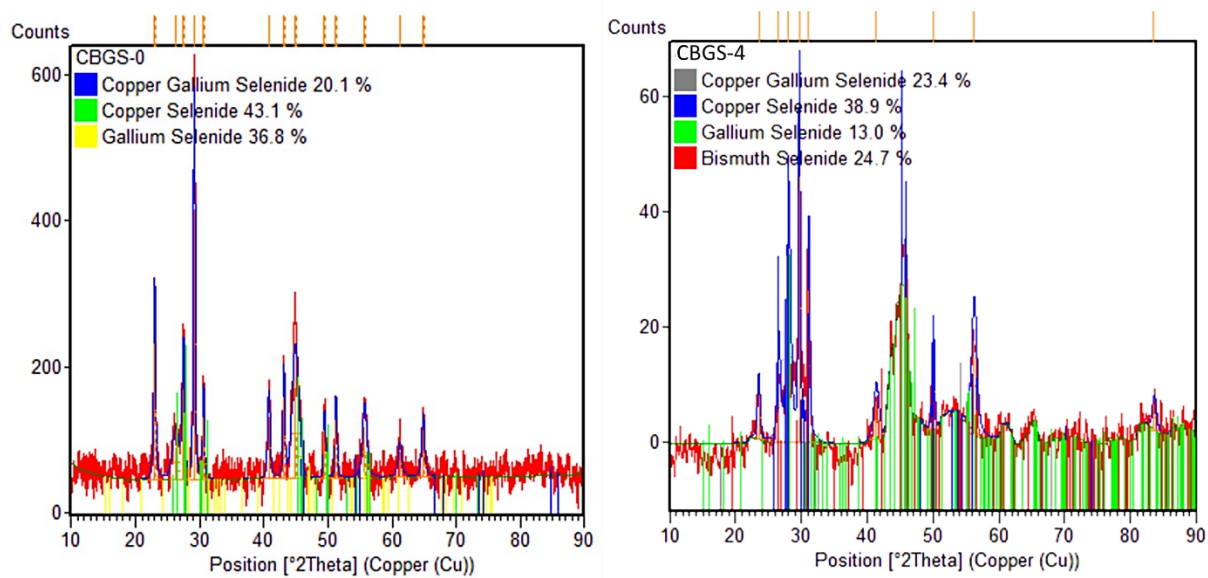


Figure S2. Rietveld refinement of the XRD patterns for CBGS-0 and CBGS-4 samples

Table S1. Rietveld refined parameters of the CBGS-0 and CBGS-4 samples

Rietveld refined parameters	CBGS-0	CBGS-4
Profile residual factor (R_p)	15.54	15.06
Weighted profile factor (R_{wp})	21.77	15.40
Expected residual factor (R_e)	11.97	7.89
Goodness of fit (χ^2)	1.81	1.94

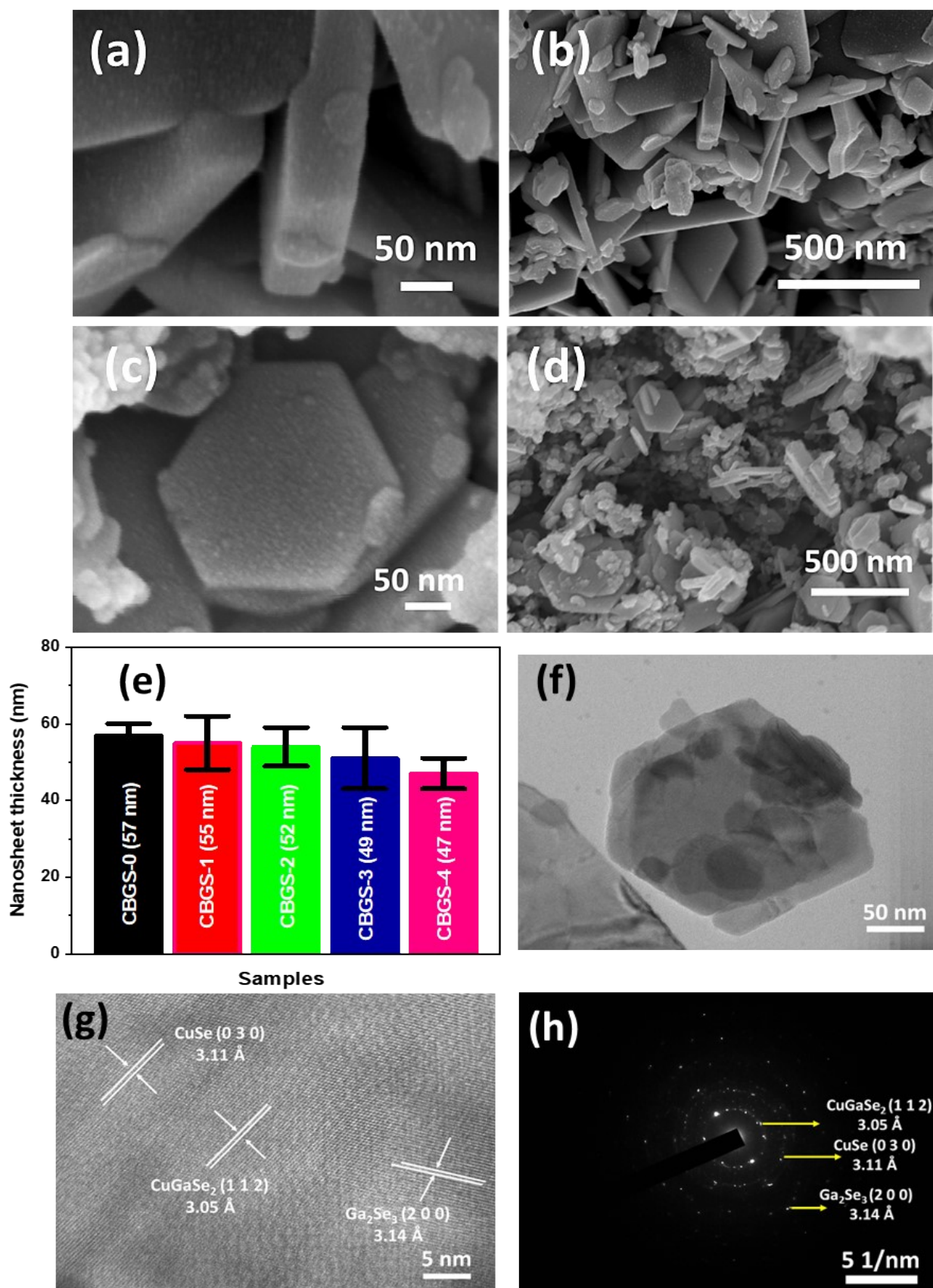


Figure S3. FESEM pictures of (a,b) CBGS-0 and (c,d) CBGS-2 samples at two scales, (e) block diagram of nanosheet thickness variation for all CBGS samples, (f) TEM picture, (g) HRTEM picture, and (h) selected area electron diffraction (SAED) pattern of CBGS-2 sample.

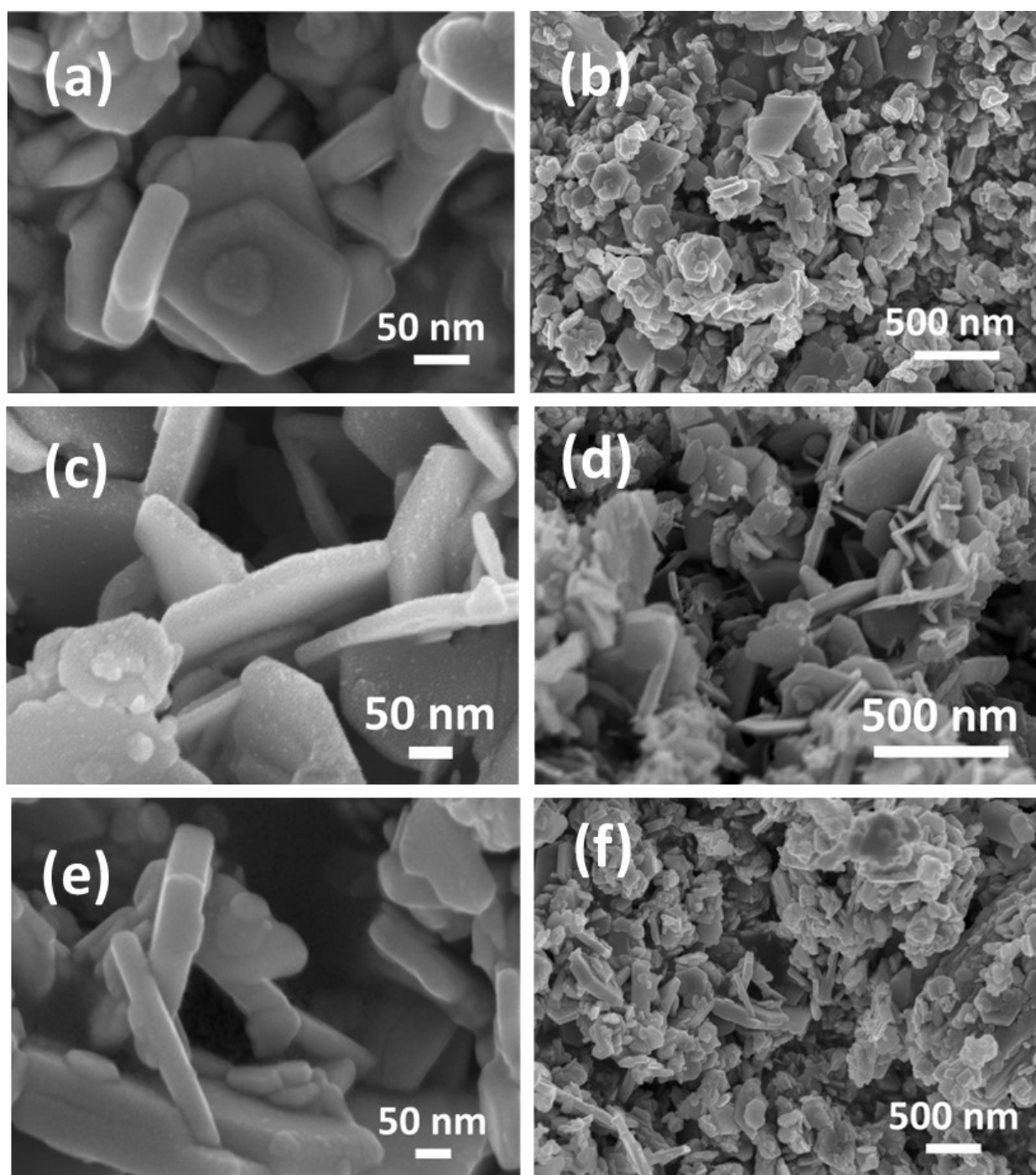


Figure S4. FESEM images of (a,b) CBGS-1, (c,d) CBGS-3, (e,f) CBGS-4 HNS samples with two different magnifications.

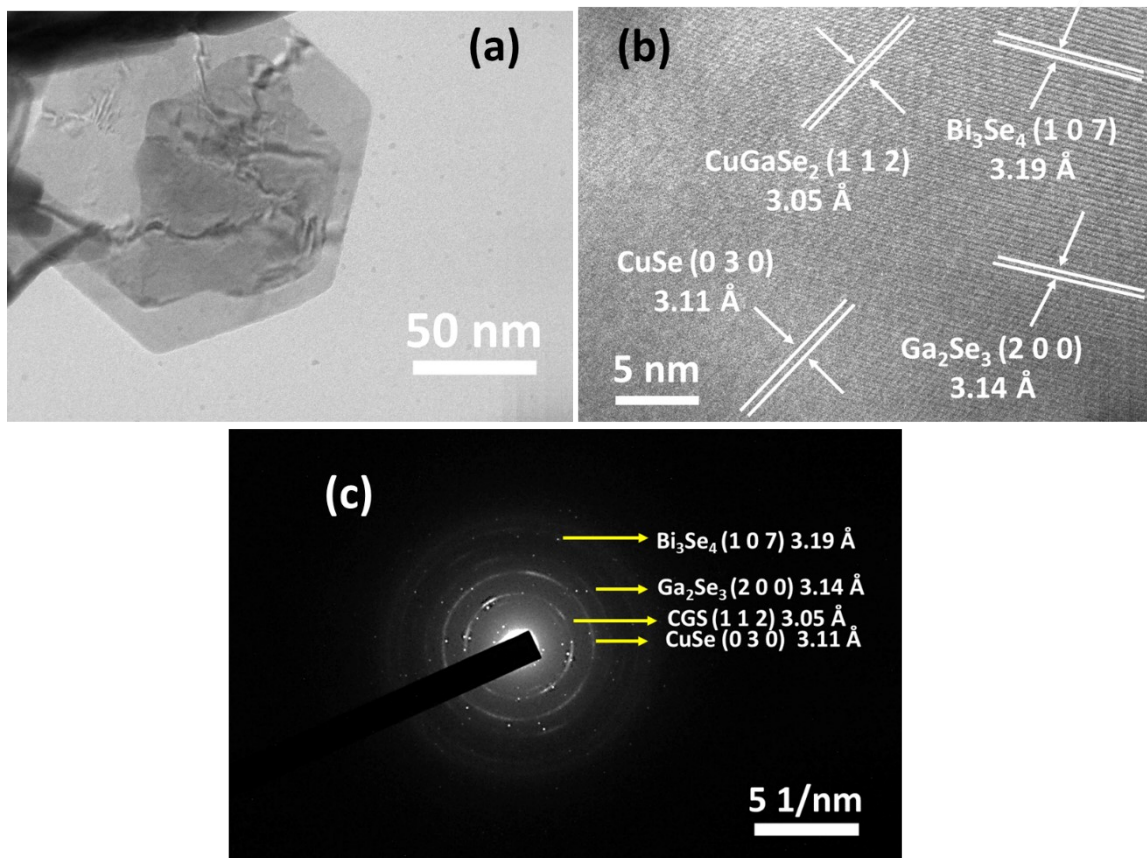


Figure S5. (a) TEM image, (b) HRTEM image, and (c) SAED pattern of CBGS-3 sample.

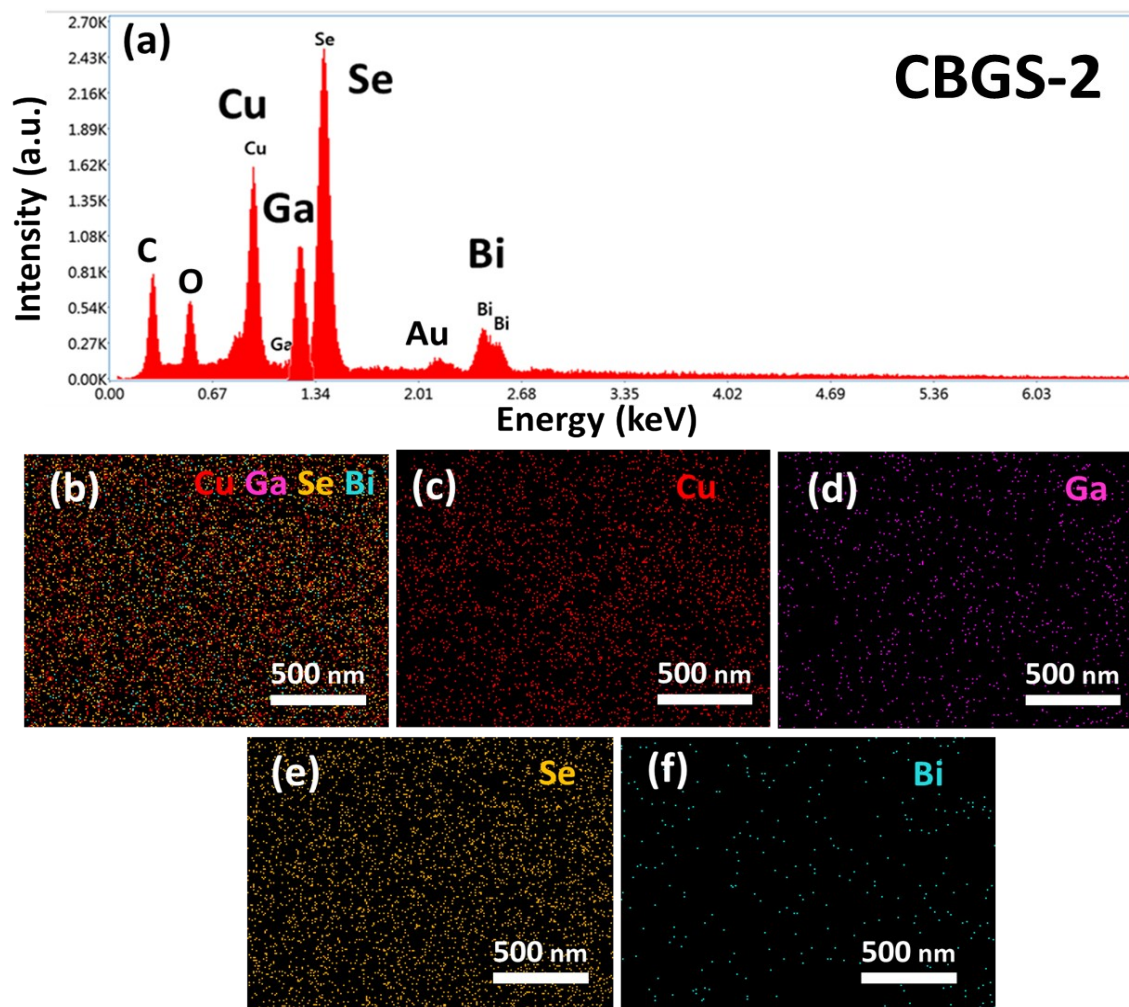


Figure S6. (a) EDX and elemental mapping correspond to (b) Cu, (c) Ga, (d) Se, (e) Bi, and (f) collective mapping of CBGS-2 HNS in the FESEM image (Figure S3(d)).

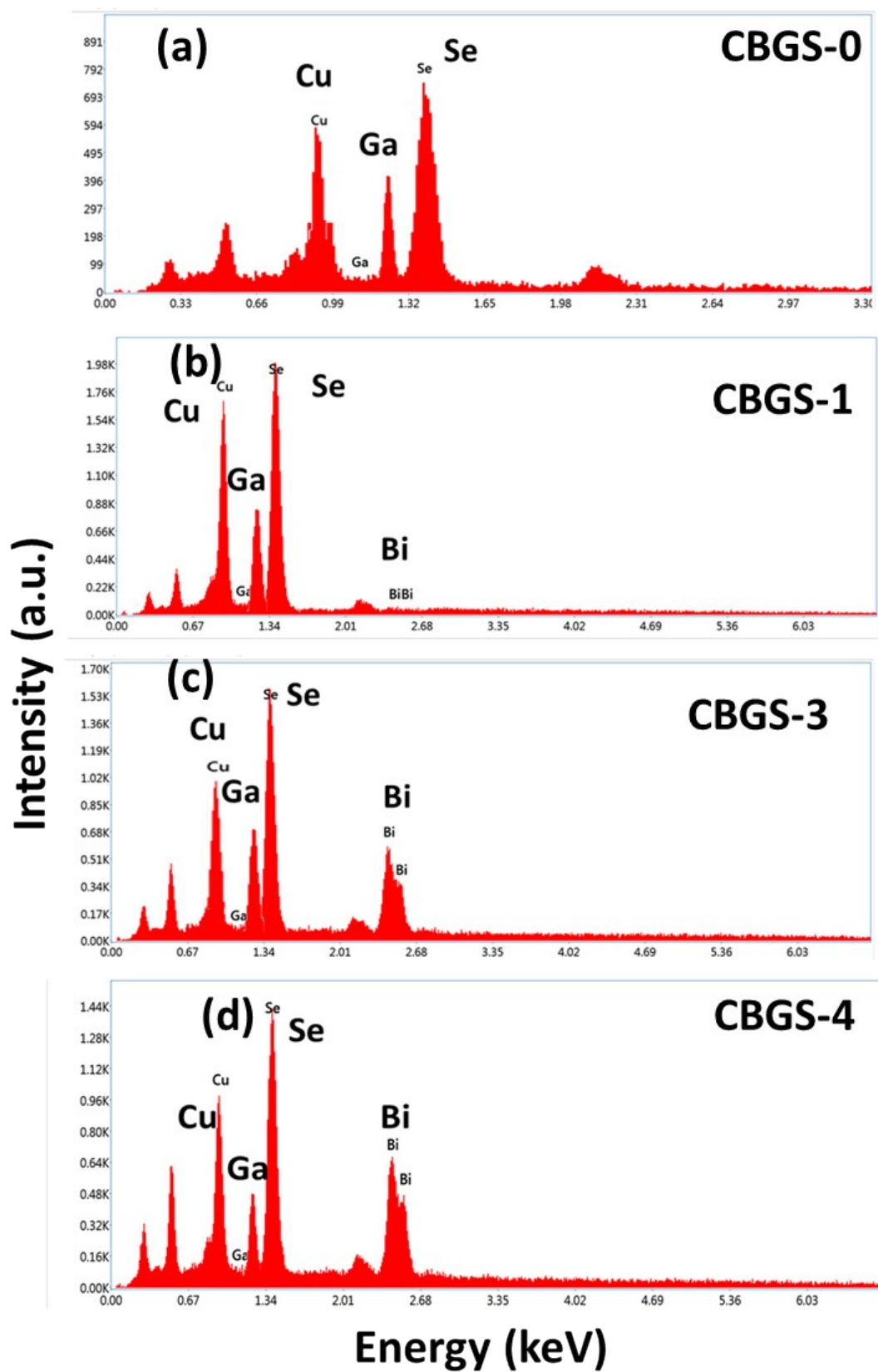


Figure S7. The EDX spectra of (a) CBGS-0, (b) CBGS-1, (c) CBGS-3, and (d) CBGS-4 HNS samples.

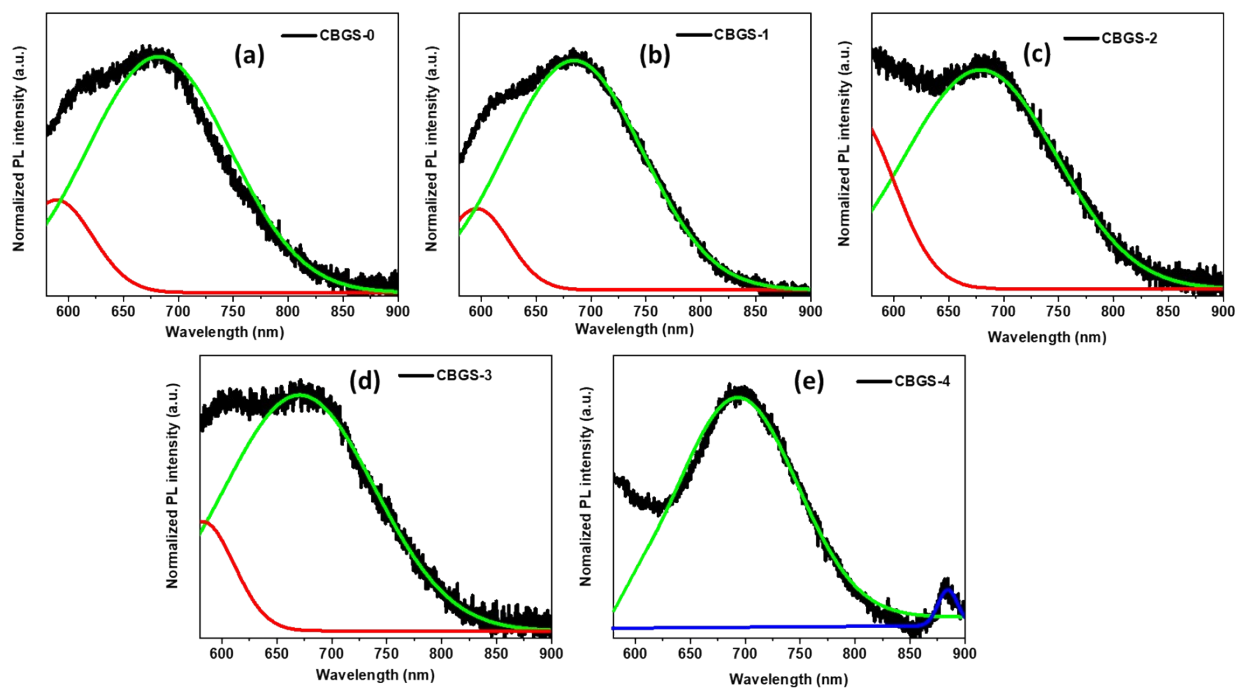


Figure S8. Deconvoluted PL spectra of (a) CBGS-0, (b) CBGS-1, (c) CBGS-2, (d) CBGS-3, (e) CBGS-4 for 532 nm excitation.

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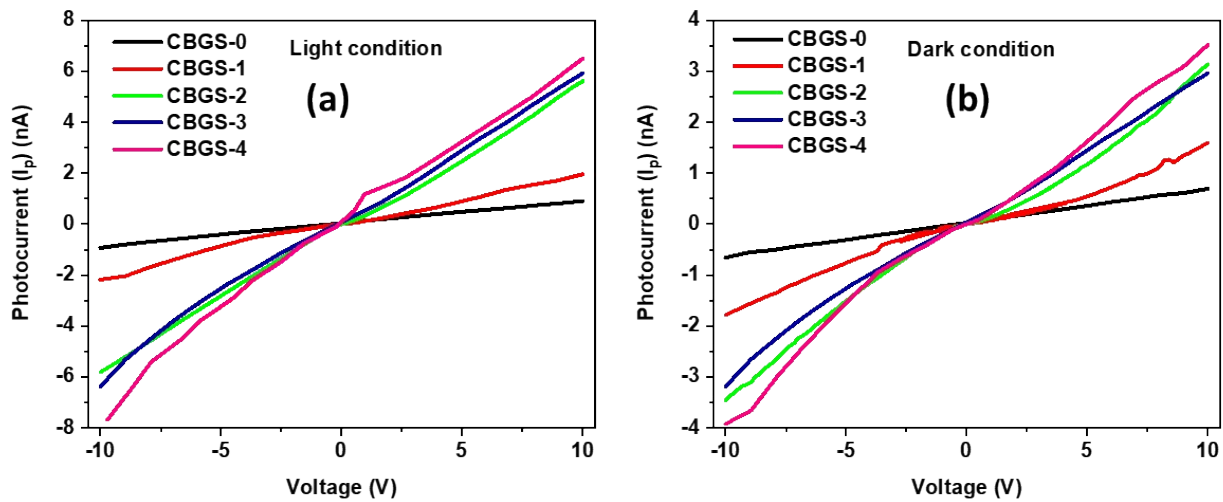


Figure S9. Cumulative current-voltage spectra of CBGS HNS samples.

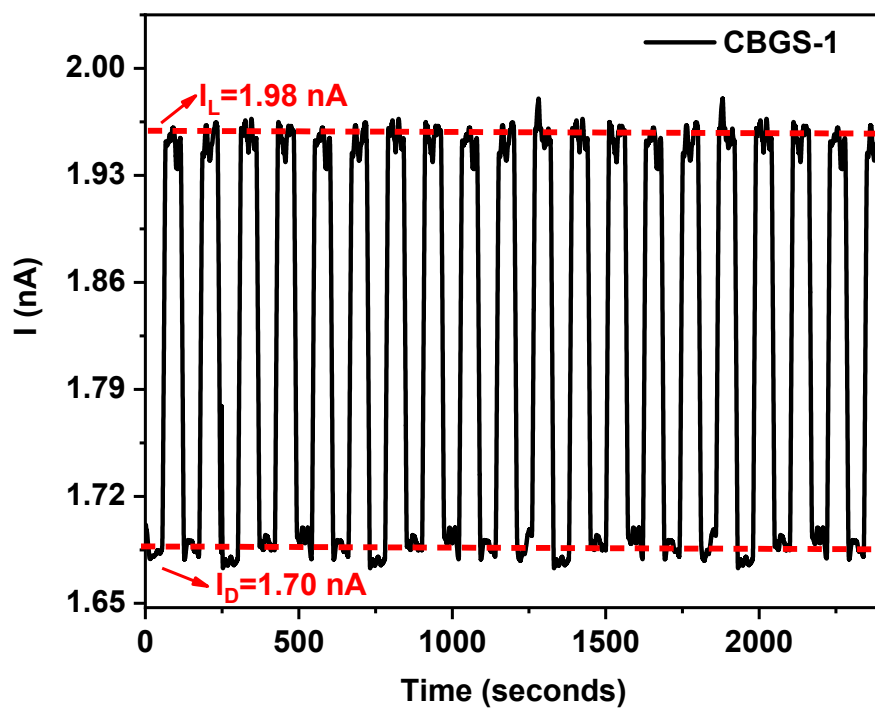


Figure S10. Transient current-time response of CBGS-1 sample for 20 complete cycles of ON/OFF for photoresponse study.

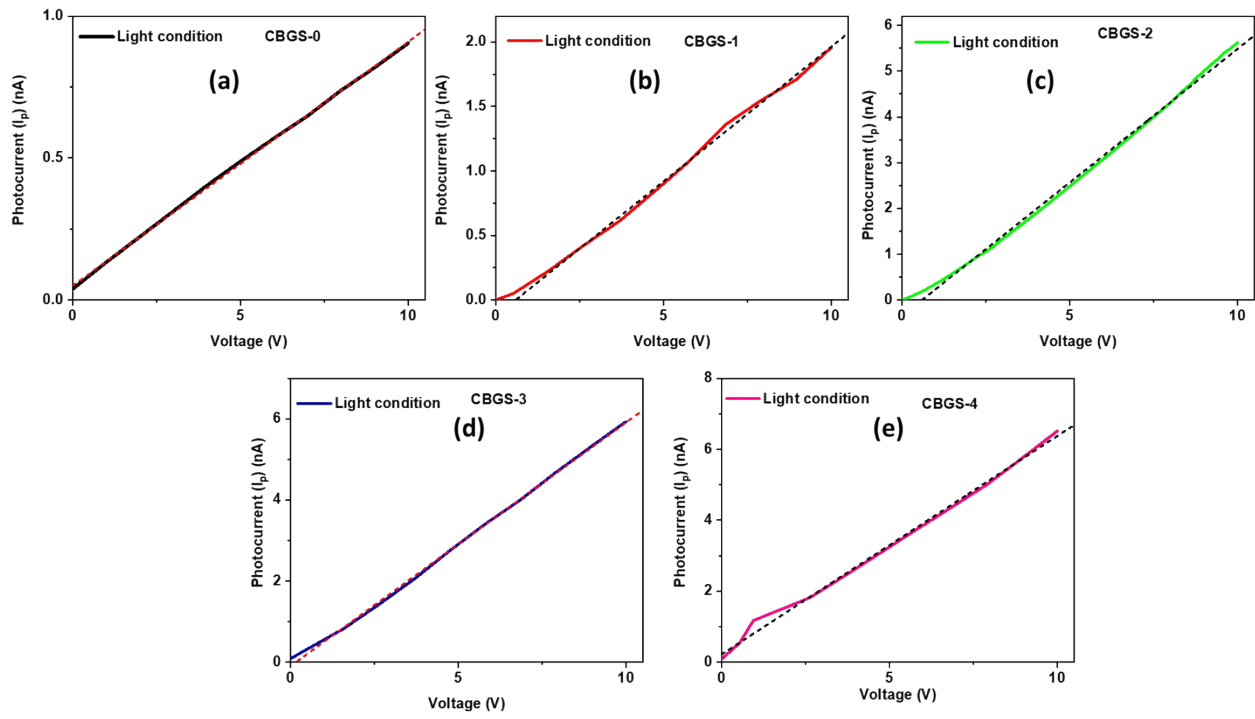


Figure S11. Evaluation of resistance of all CBGS HNS samples in the presence of light.

Table S2. Elemental composition variation comparison of different CBGS HNS.

Sample	CBIS-0		CBIS-1	CBIS-2	CBIS-3	CBIS-4	
	EDX	XPS	EDX	EDX	EDX	EDX	XPS
Cu	26.12	25.99	24.93	25.95	24.86	25.58	24.68
Se	50.07	50.11	50.12	50.04	50.28	49.91	50.12
In	23.81	23.90	20.02	14.03	9.80	5.16	4.99
Bi	0	0	4.93	9.98	15.06	19.35	20.21
Total	100	100	100	100	100	100	100