

## Self-biased wavelength selective photodetection in an n-IGZO/p-GeSe heterostructure by polarity flipping.

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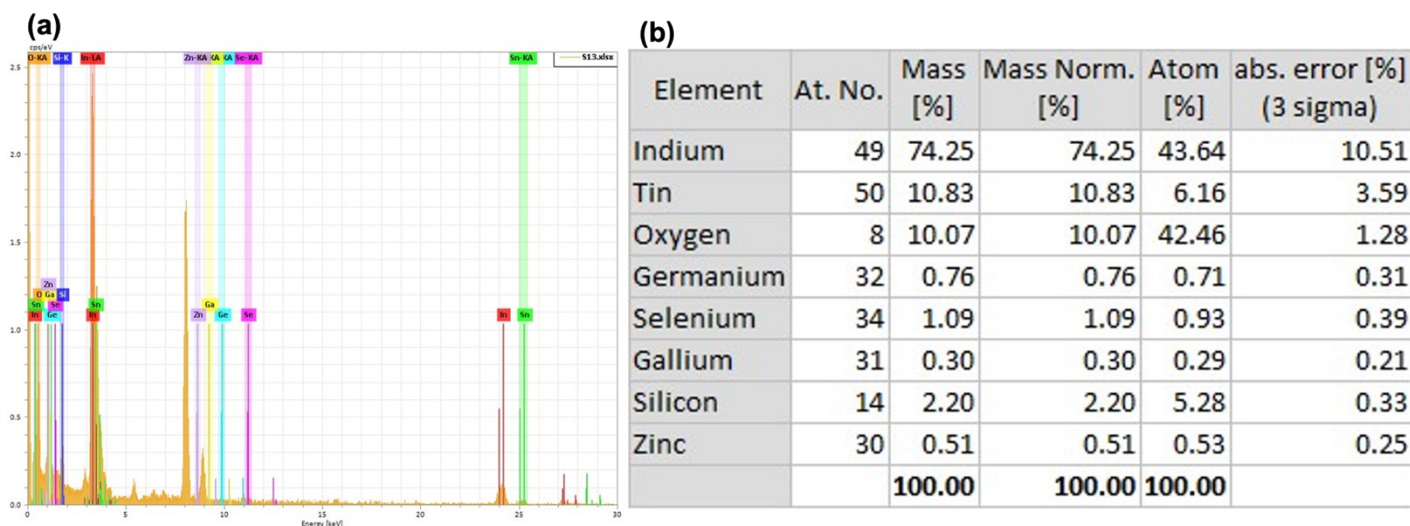
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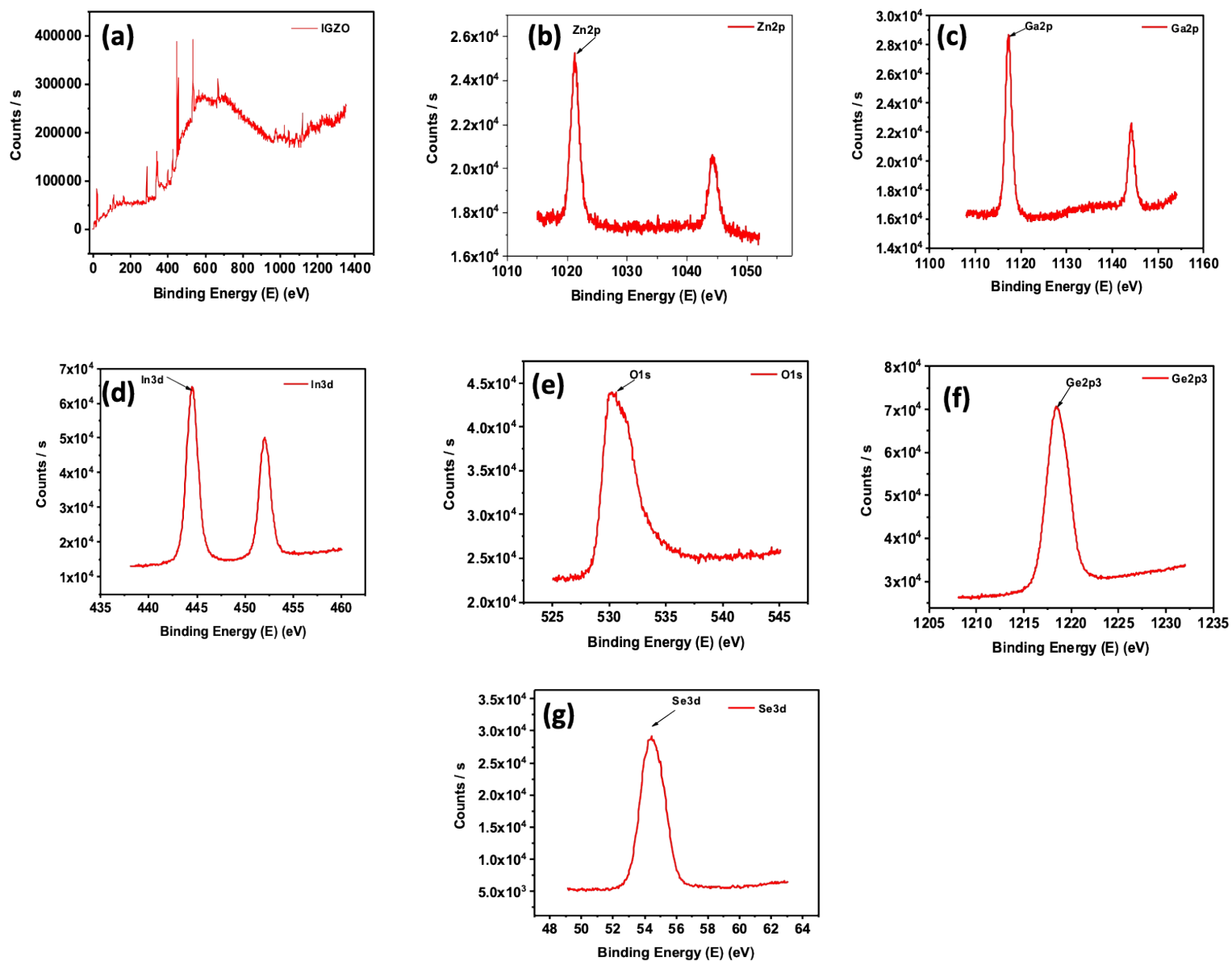
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## Supporting Information



**Figure S1.** (a-h) EDS spectrum analysis of the elements **In, Sn, O, Ge, Ga, Si** and **Zn** validates the evidence of IGZO and GeSe film on ITO substrate.



**Figure S2.** (a-h) X ray photoelectron spectroscopy (XPS; PHI 5000 Versa Probe) under Al K $\alpha$  at 25 W and  $6.7 \times 10^{-8}$  Pa to confirm the chemical composition and binding energy.

Table 1. Performance parameters comparison of IGZO/GeSe heterostructure device.

No	Device configuration	Responsivity (A/W)	Detectivity (Jones)	Rise time (ms)	Fall time (ms)	Bias voltage (V)	Ref.
1	GeSe/MoS <sub>2</sub>	0.105	1.03x10 <sup>10</sup>	110	750	0	1
2	Metal/GeSe	0.28	4.1 × 10 <sup>9</sup>	69	92	0	2
3	GeSe/MoSe <sub>2</sub>	0.465	7.3 × 10 <sup>9</sup>	180	360	0	3
4	PtSe <sub>2</sub> /BN/Graphene	1.4879	2.0 × 10 <sup>9</sup>	31	33	2	4
5	GeSe/WS <sub>2</sub>	0.85	3.28 × 10 <sup>8</sup>	10	14	0	5
6	IGZO/GeSe	0.538	8.4 × 10 <sup>9</sup>	25	25	0	This work

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