

## Electronic supplementary information

### Polarization enhanced photoresponse of InSe via 2D ferroelectric CuCrP<sub>2</sub>S<sub>6</sub>

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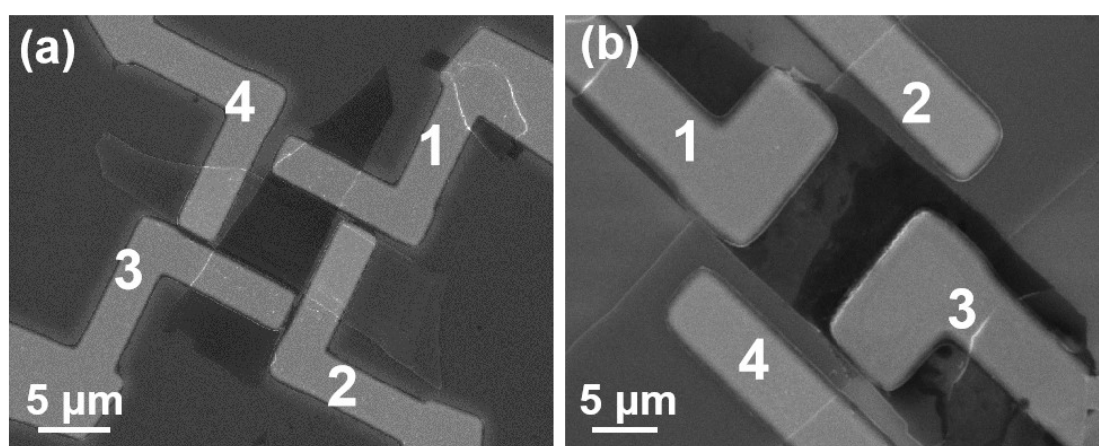


Fig.S1 SEM images of InSe/CCPS (a) device A; (b) device B.

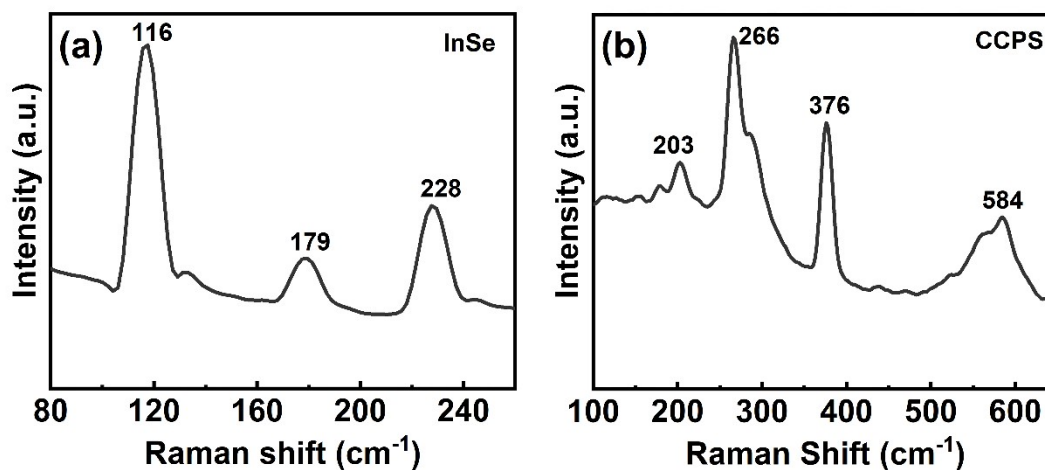


Fig.S2 Raman spectra of (a) InSe and (b) CCPS.

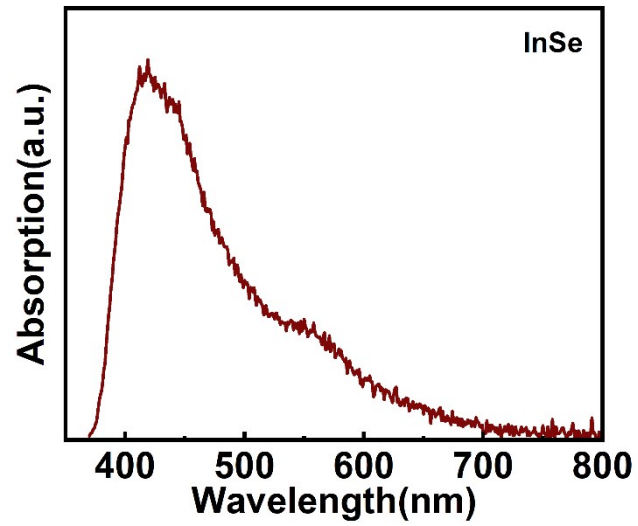


Fig.S3 Absorption spectrum of InSe

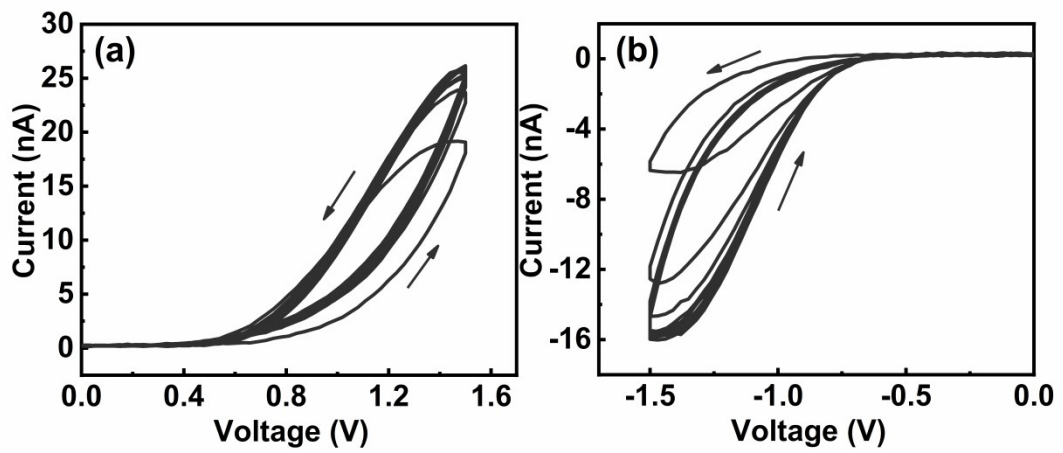


Fig.S4 Current-voltage (I-V) characteristics of the Au/CCPS/Au device with ten cycles of scanning: (a) from 0 to 1.5 V and then 1.5 to 0 V, and (b) from 0 to -1.5 V and then -1.5 to 0 V.

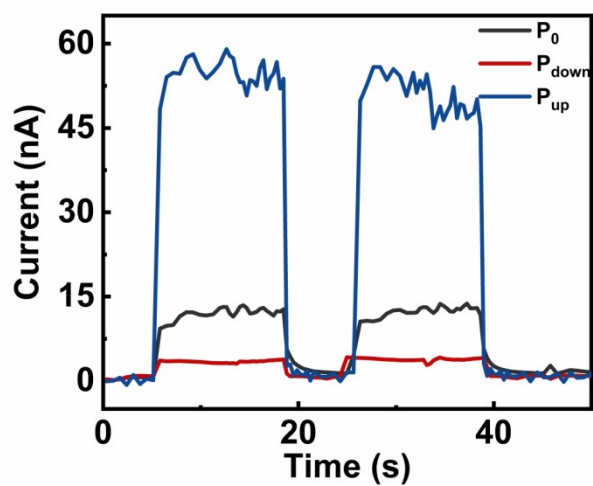


Fig.S5 Photo switching curves of device B at  $P_0$ ,  $P_{up}$  and  $P_{down}$  states (350 nm and a bias voltage of 3 V).

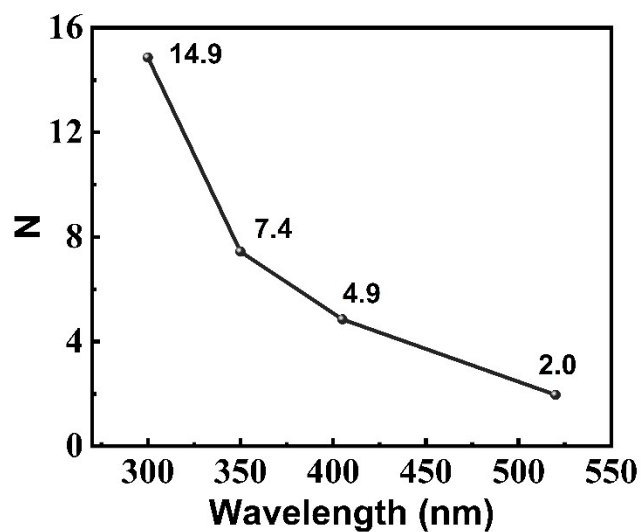


Fig.S6 Photocurrent ratio of  $P_{up}$  and  $P_{down}$  at different wavelengths