

Supporting Information

Solution-grown ternary quasi-cube AgSbTe_2 and their optoelectronic performance for broadband photodetection

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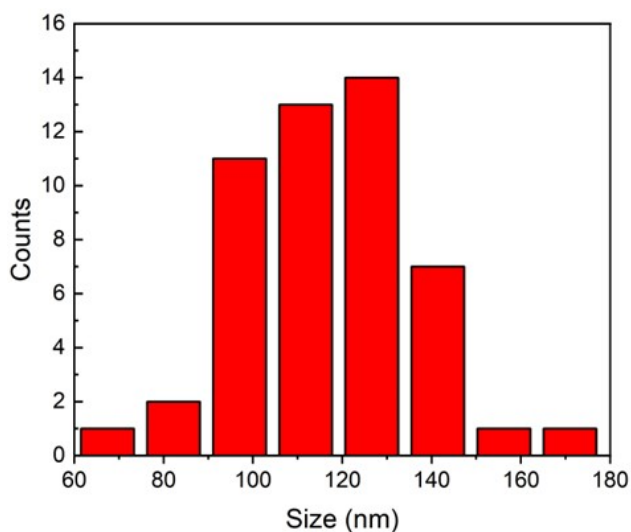


Figure S1. The size-distribution histograms of AgSbTe_2 nanocrystals.

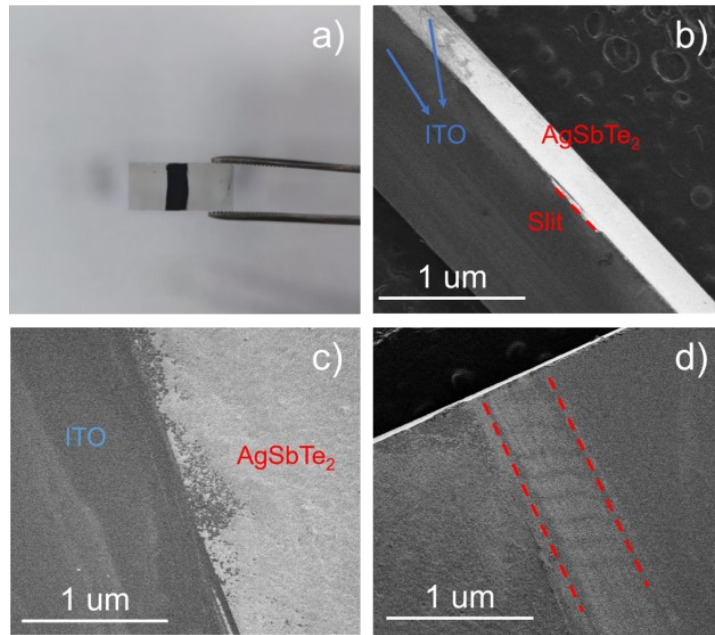


Figure S2. (a) The real photo of photodetector and (b-d) SEM images of photodetector.

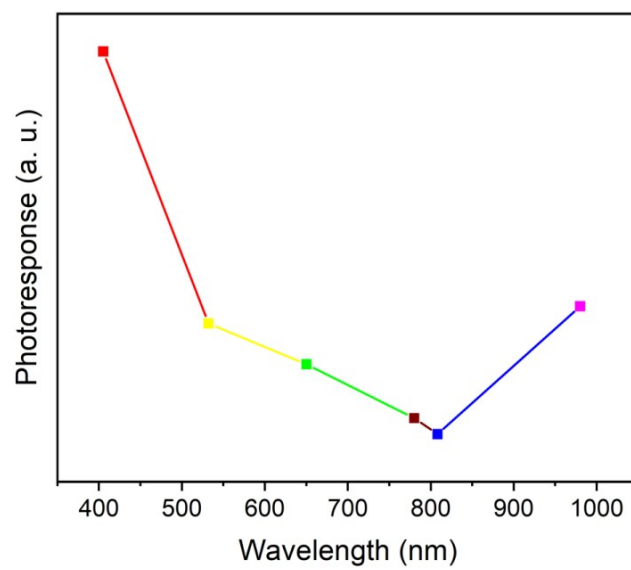


Figure S3. The wavelength dependent photoresponse using varied wavelengths from 405 to 980 nm.

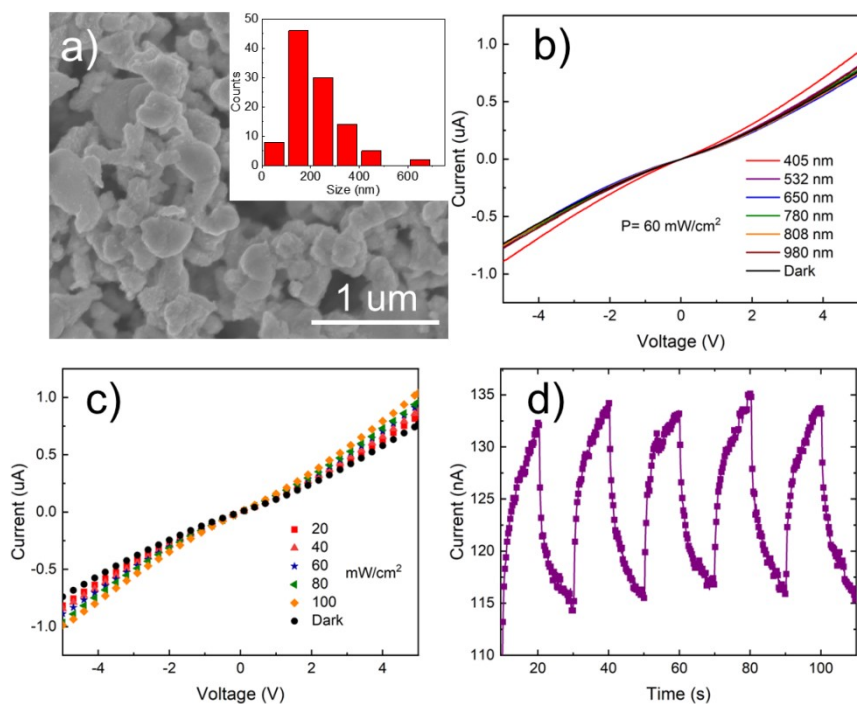


Figure S4. (a) The size-distribution histograms of AgSbTe₂ nanocrystals reacted at 210 °C for 30 min. (b) I-V curves in the dark and under different wavelengths of light sources with a constant light illumination power. (c) I-V curves under 405 nm irradiation with varied light illumination power from 20 to 100 mW/cm². (d) Temporal photoresponse of the device at bias voltage of 1 V.

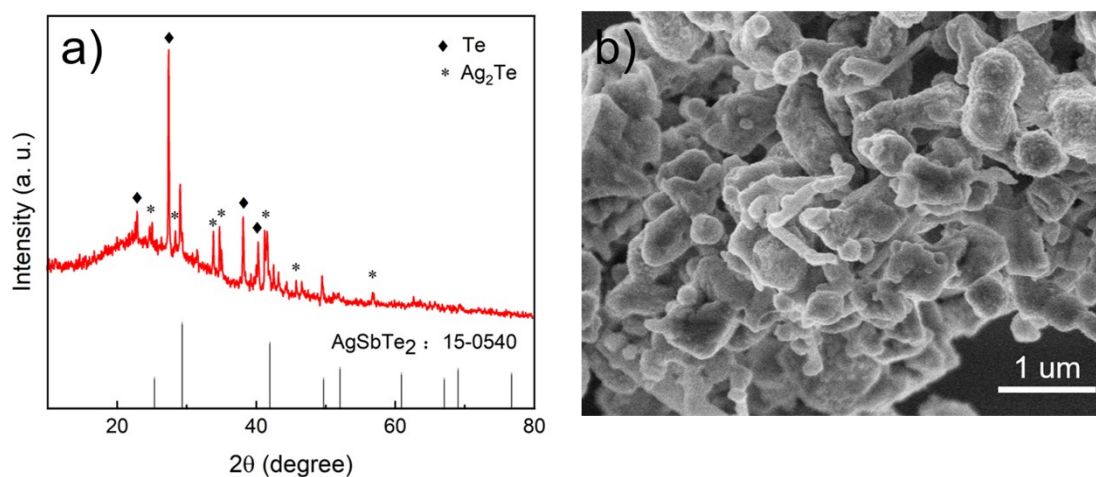


Figure S5. a) XRD patterns of AgSbTe₂ nanocrystals obtained in 1-octadecene. b) SEM of AgSbTe₂ nanocrystals obtained in 1-octadecene.

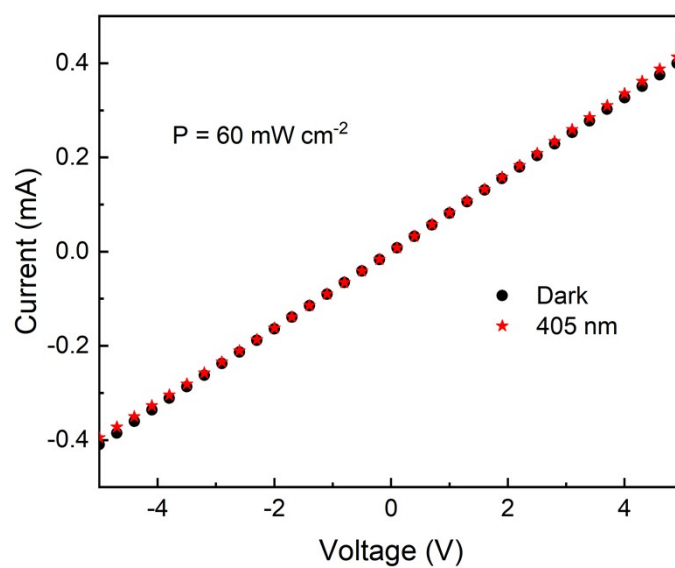


Figure S6. I - V plots photodetectors measured of AgSbTe₂ nanocrystals obtained in 1-octadecene in the dark and under 405 nm illumination.

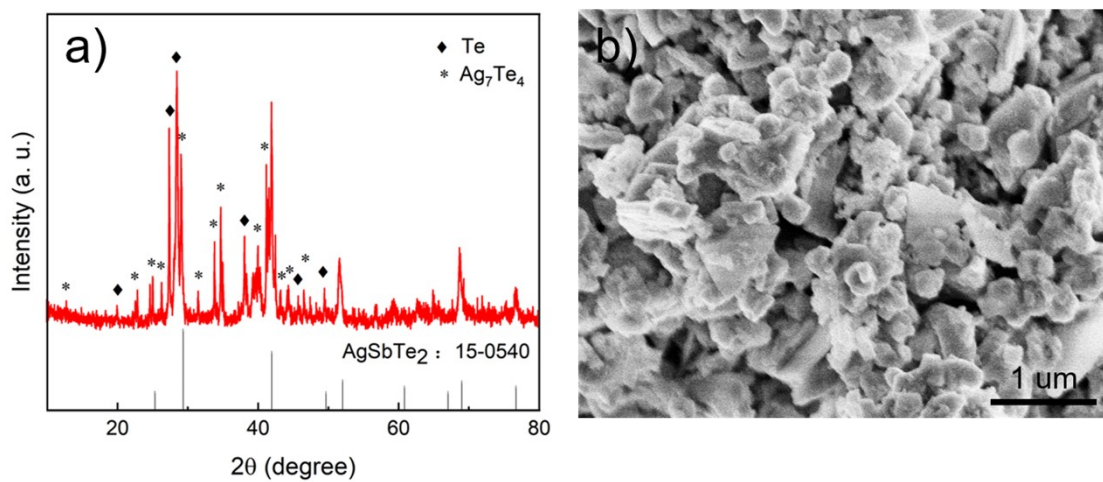


Figure S7. a) XRD patterns of AgSbTe₂ nanocrystals obtained at 240 °C for 30 min. b) SEM of AgSbTe₂ nanocrystals obtained at 240 °C for 30 min.

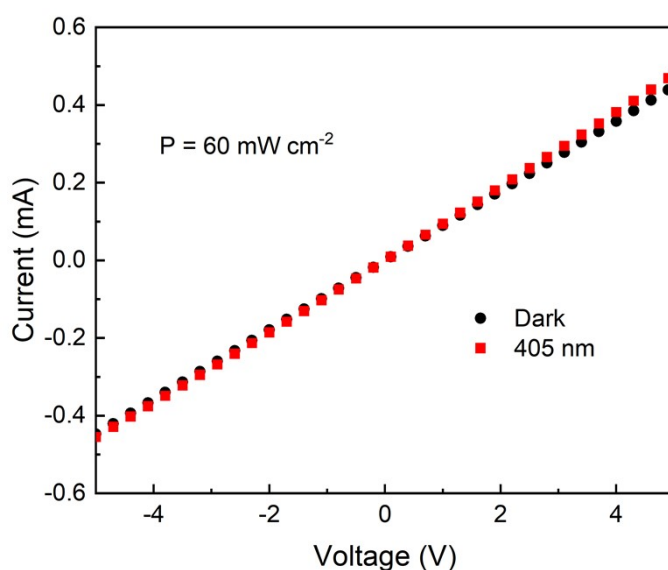


Figure S8. I - V plots photodetectors measured of AgSbTe₂ nanocrystals obtained at 240 °C for 30 min in the dark and under 405 nm illumination.

Table S1. Comparison of the photoelectric performance parameters for the present AgSbTe₂ nanocrystals with other recent reported colloidal nanocrystals-based solution-processed photodetectors.

| structures | Wavelengths (nm) | Power density (mW/cm ²) | Responsivity (mA/W) | Rise/fall time (s) | Detectivity (Jones) | Refs. |
|-----------------------------------|------------------|-------------------------------------|---------------------|--------------------|----------------------|---|
| AgSbTe ₂ | 405-980 | 5 | 2.44 | 0.49/0.58 | 2.0×10^9 | This work |
| SnSe ₂ | 405-1064 | 150 | 6.7 | 3.7/3.1 | — | <i>CrystEngComm</i> , 2021 , 23,2034 |
| NiTe ₂ | 650-1550 | 11.2 | 18.45 | 0.31/0.21 | 8.3×10^8 | <i>ACS Appl. Nano Mater.</i> , 2022 , 5, 6094–6099 |
| AgBiS ₂ | 350-1070 | — | 375 | — | 3.0×10^{11} | <i>Nanoscale</i> , 2022 , 14, 4987 |
| Cu ₃ NbSe ₄ | 400 | 20 | — | 0.3/0.1 | — | <i>DaltonTrans.</i> , 2022 , 51,16937 |