Supplementary Information (SI) for Journal of Materials Chemistry C.

Efficient broadband light sensing with anisotropic Sb_2S_3 based thin film heterojunction photodetectors under self-driven condition

Srinivasan Moosi Govindharajulu[1], Jaivardhan Sinha[2] and Malar Piraviperumal[1*]

[1]Thinfilm Photovoltaics Laboratory, Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu-603 203, India.
[2]Spintronics and Nanomagnetism Laboratory, Department of Physics and Nanotechnology, SRM Institute of Science and Technology, Kattankulathur, Chengalpattu, Tamil Nadu-603 203, India.

Supplementary File

Table S1. As-deposited and post sulfurized Sb_2S_3 thin films crystallite size, dislocation density and microstrain values calculated from Williamson–Hall plots.

Sample	Crystallite size (nm)	Dislocation density (δ)$\times 10^{14}$ (m^{-2})	Micro strain (ε) $\times 10^{-4}$
S-250 °C	29.5	11.4	6.7
S-275 °C	35.5	7.9	5.6
S-300 °C	43.3	5.3	4.6
S-325 °C	53.2	3.5	5.8

---

[*] malar.piraviperumal@gmail.com

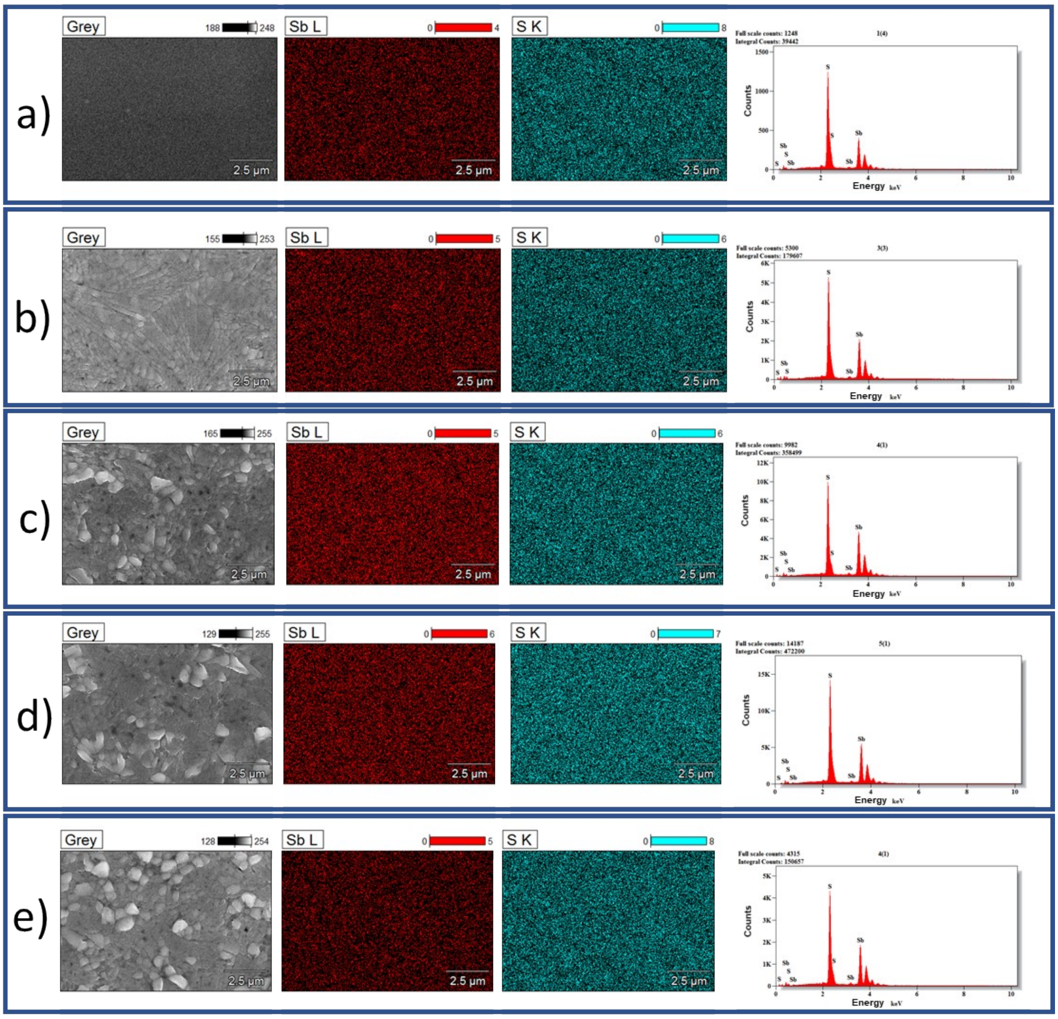

Figure S1. Elemental mapping profiles and EDX spectra of the Sb_2S_3 thin films (a) as-deposited, (b) S-250 °C, (c) S-275 °C, (d) S-300 °C and (e) S-325 °C.

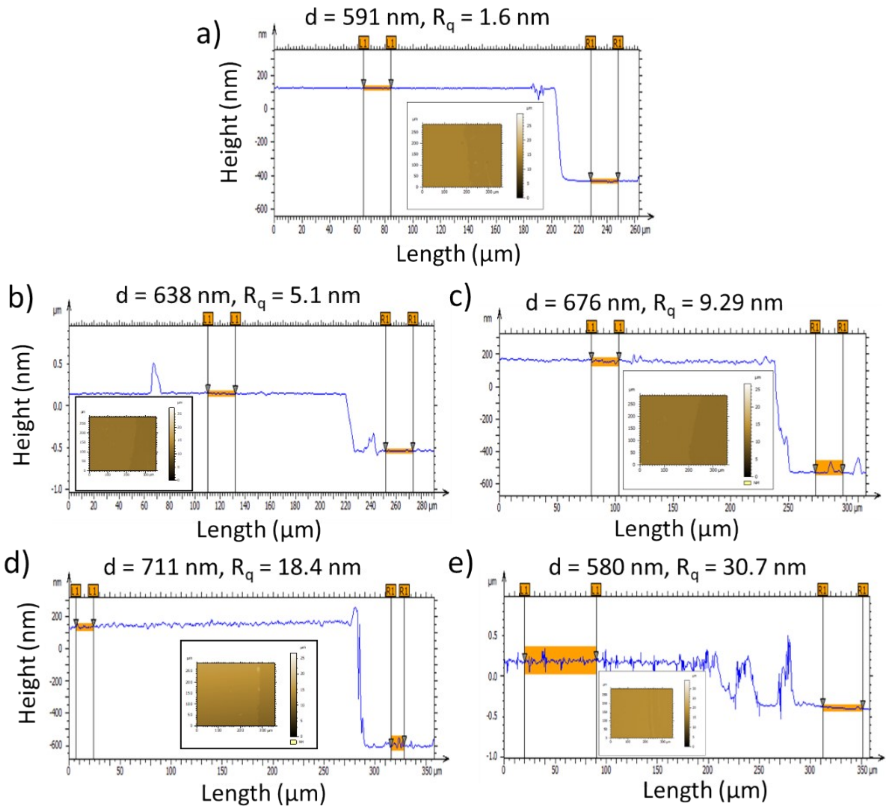

Figure S2. Optical profilometer 1D and 2D data of the Sb_2S_3 thin films (a) as-deposited, (b) S-250 °C, (c) S-275 °C, (d) S-300 °C and (e) S-325 °C

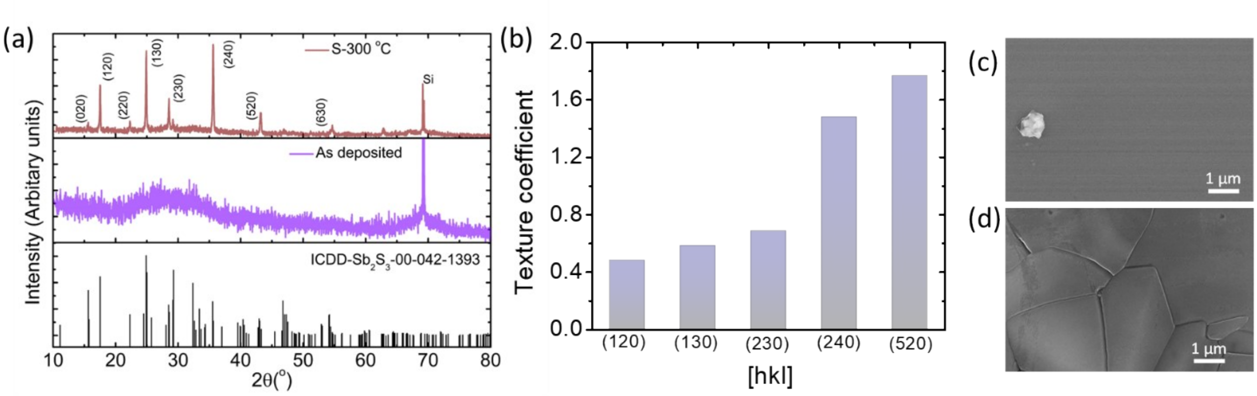

Figure S3. (a) XRD patterns of as-deposited and post sulfurized Sb_2S_3 thin films prepared on Si, (b) texture coefficient for post sulfurized Sb_2S_3 thin film, SEM images of (c) as-deposited and (d post sulfurized Sb_2S_3 thin films prepared on Si

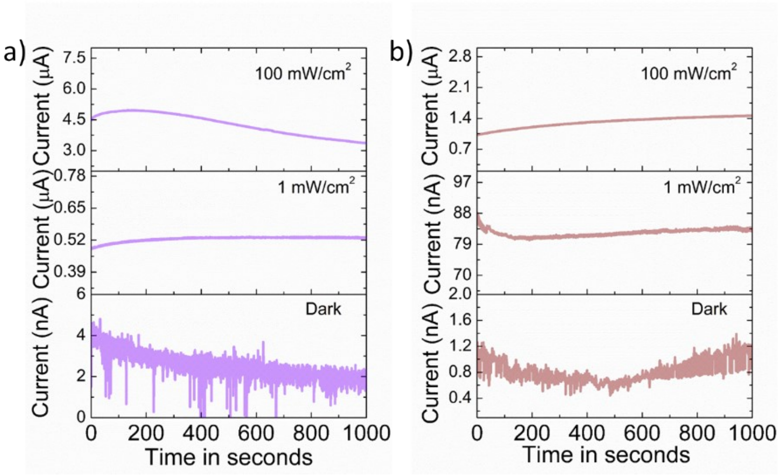

Figure S4. Current for longer exposure time under dark and 1 mW/cm² and 100 mW/cm² white light intensities for (a) as-deposited and (b) S-300 °C photodetectors

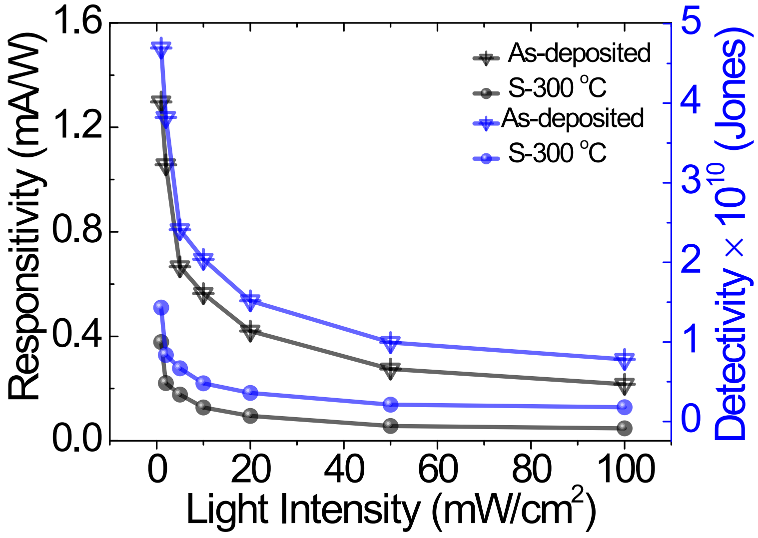

Figure S5. Responsivity and detectivity values measured under white light illumination with varied light intensity (1-100 mW/cm²) for the as-deposited and S-300 °C heterojunction photodetectors