SUPPORTING INFORMATION

Solution-processed ternary copper halides thin films for air-stable and deep-ultraviolet-sensitive photodetector

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Effect of annealing temperature on the crystallinity and morphology characteristics of $Cs_3Cu_2I_5$ thin films

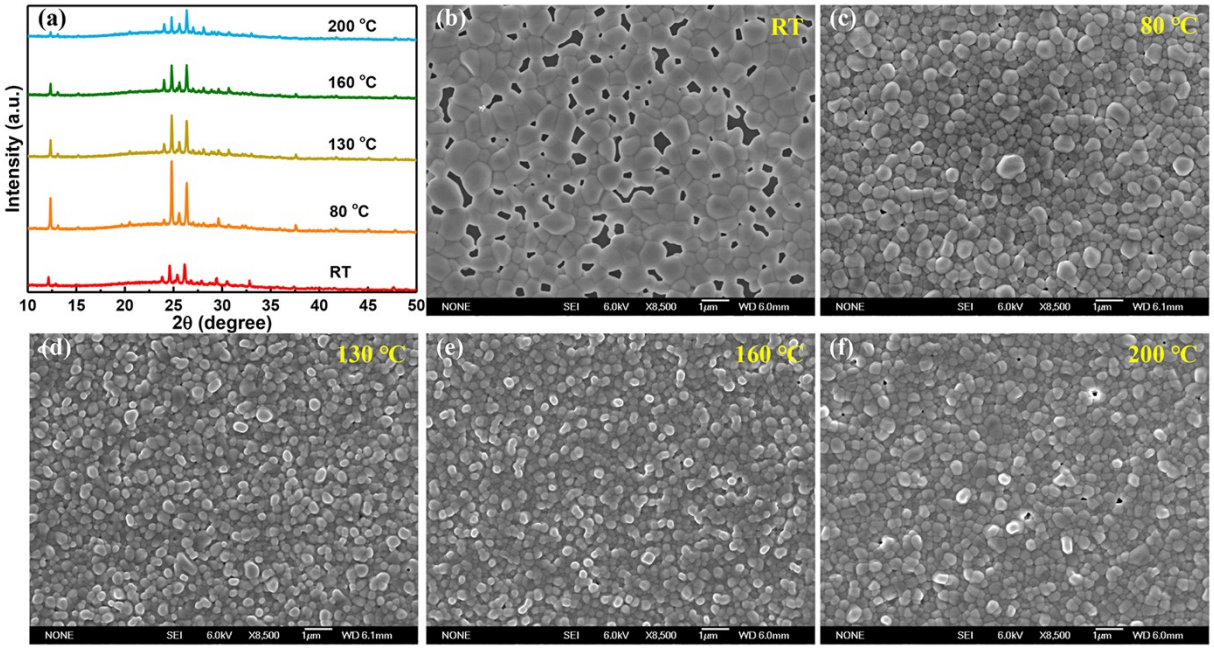

Figure S1. XRD patterns and SEM images of the $Cs_3Cu_2I_5$ thin films at different annealing temperatures.

Confirmation of the thickness of the $Cs_3Cu_2I_5$ thin films

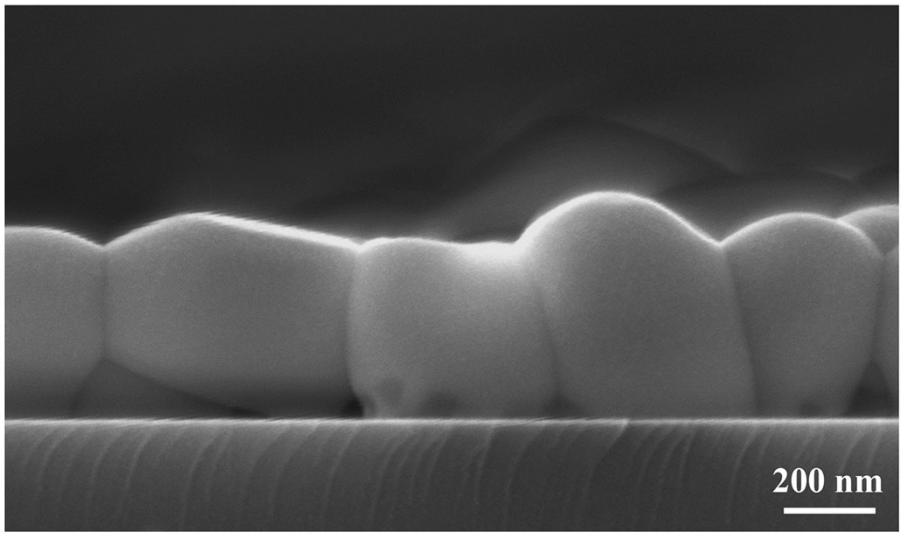

Figure S2. Cross-sectional SEM image of the $Cs_3Cu_2I_5$ thin films.

Elemental compositions and distribution of the $Cs_3Cu_2I_5$ thin films

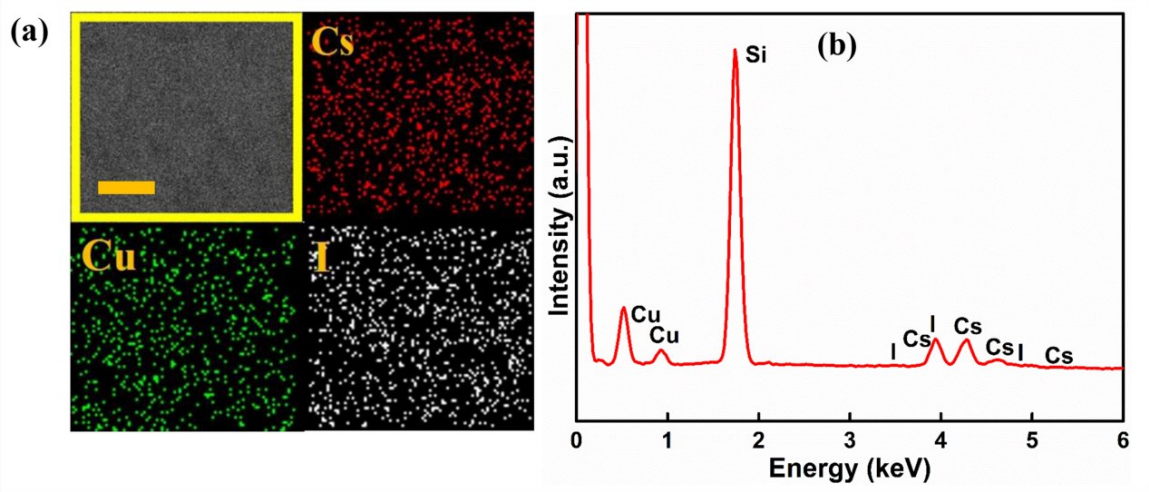

Figure S3. (a) EDS mapping of the $Cs_3Cu_2I_5$ thin films showing the uniform distribution of Cs, Cu, and I elements. (b) EDS spectra of the $Cs_3Cu_2I_5$ thin films, confirming the elemental composition.

Confirmation of the photostability of the $Cs_3Cu_2I_5$ thin films

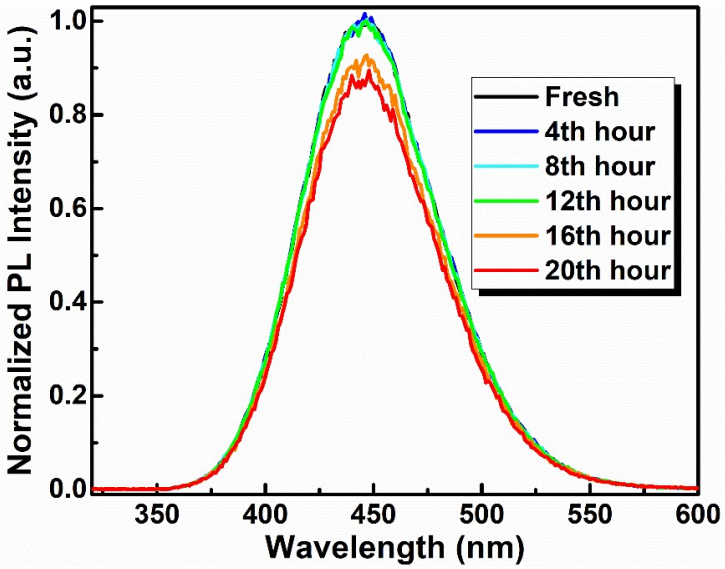

Figure S4. PL spectra of the as-grown $Cs_3Cu_2I_5$ thin films under continuous UV light irradiation with different illumination time.

Thermal cycling PL measurement showing the thermal stability of $Cs_3Cu_2I_5$ thin films

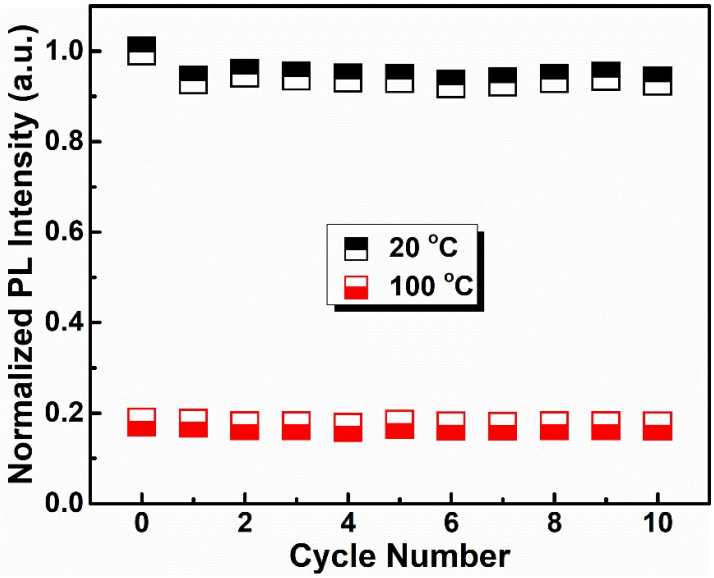

Figure S5. Integrated PL intensity of the $Cs_3Cu_2I_5$ thin films at two representative temperature points (20 and 100 °C) over ten cycling measurements.

Confirmation of the good stability of the $Cs_3Cu_2I_5$ thin films after ten heating/cooling cycles treatment

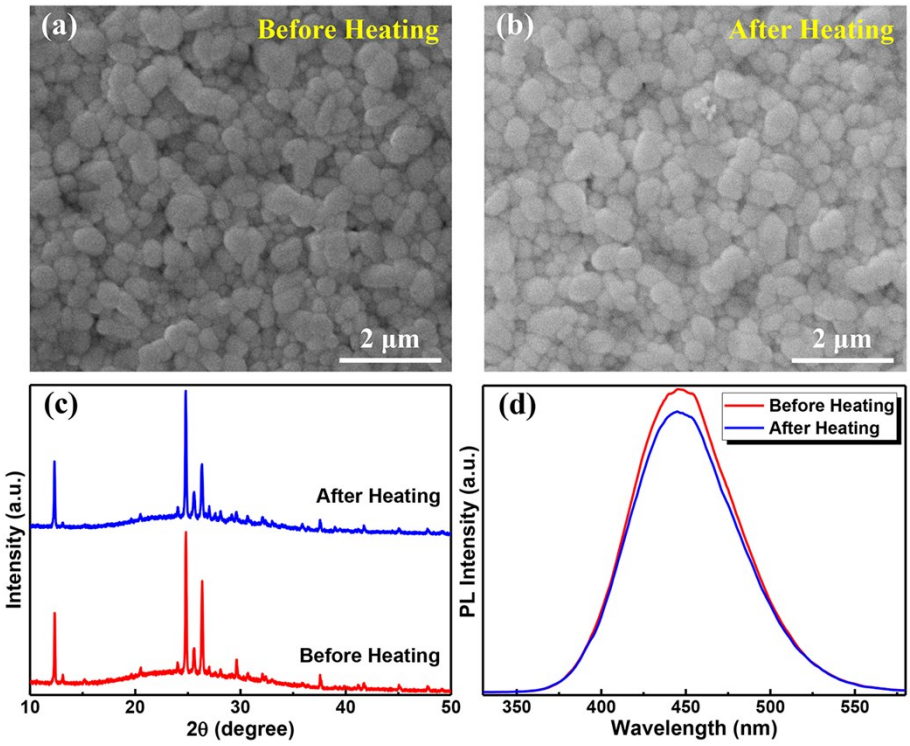

Figure S6. Comparisons of the (a, b) SEM images, (c) XRD patterns, and (d) PL spectra of the $Cs_3Cu_2I_5$ thin films before and after ten heating/cooling cycling PL measurements.

Photoresponse characteristics of the photodetector under pulsed light illumination at different frequencies

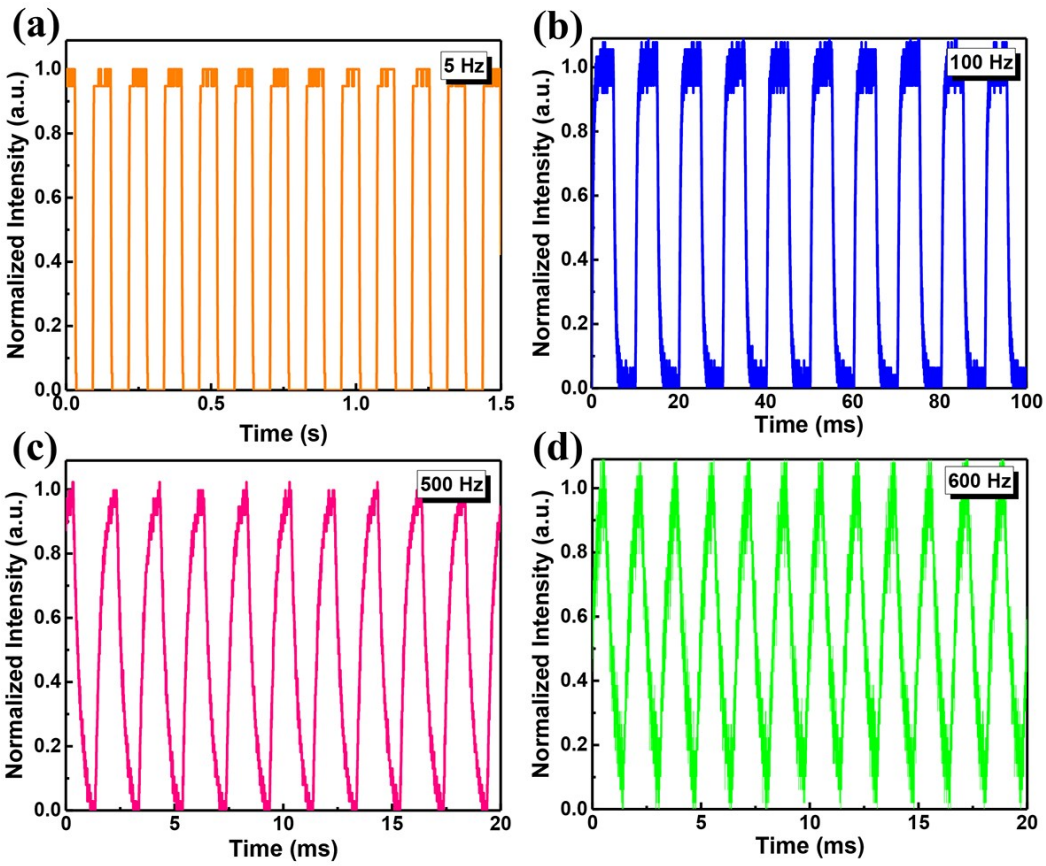

Figure S7. Photoresponse characteristics of the photodetector under pulsed light illumination at frequencies of (a) 5 Hz, (b) 100 Hz, (c) 500 Hz, and (d) 600 Hz, respectively.