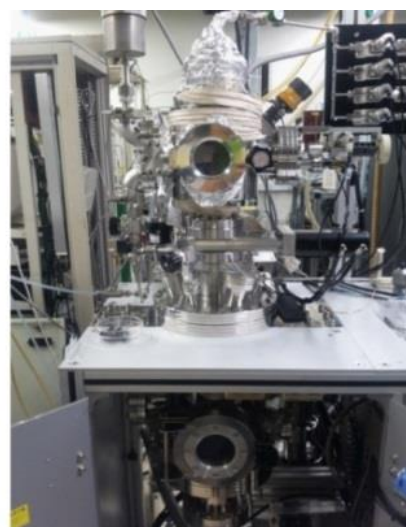
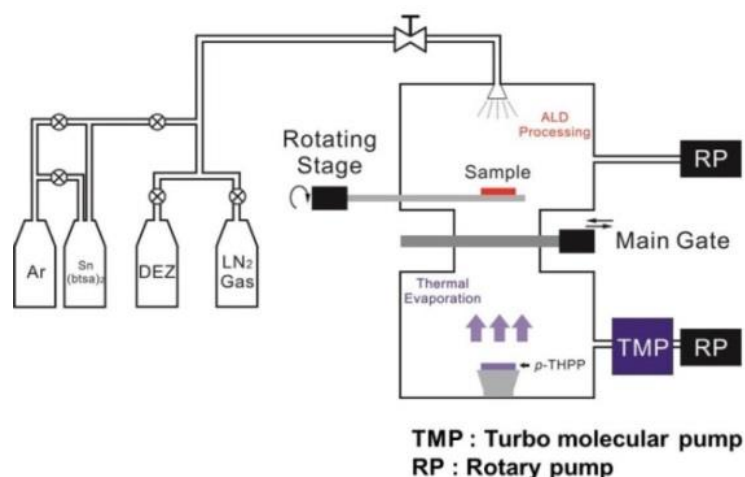


**Supporting Information:**

## **Selective coordination with heterogeneous metal atoms for inorganic-organic hybrid layers**

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**Fig. S1.** Schematic of the organic-inorganic hybrid deposition system for synthesis of Zn(II)-*p*-THPP-Sn(II) hybrid thin films.

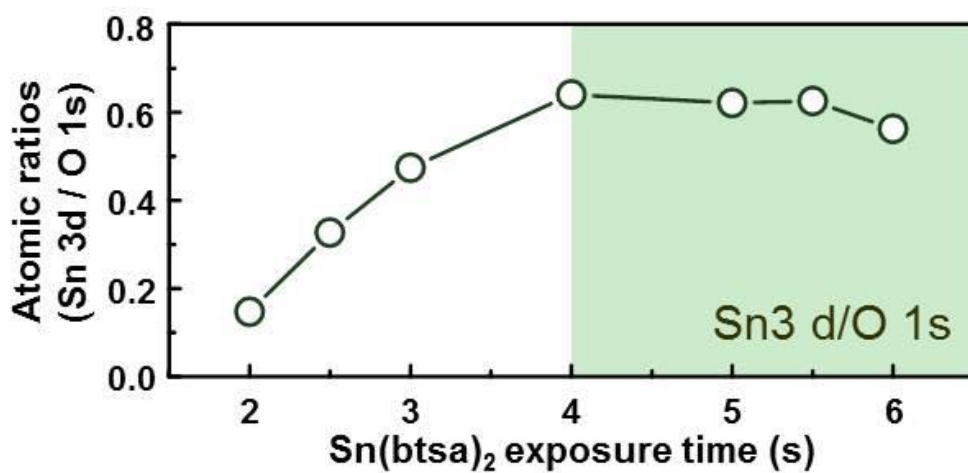


Fig. S2. Plots for the atomic ratios of the Sn 3d to O 1s peaks.

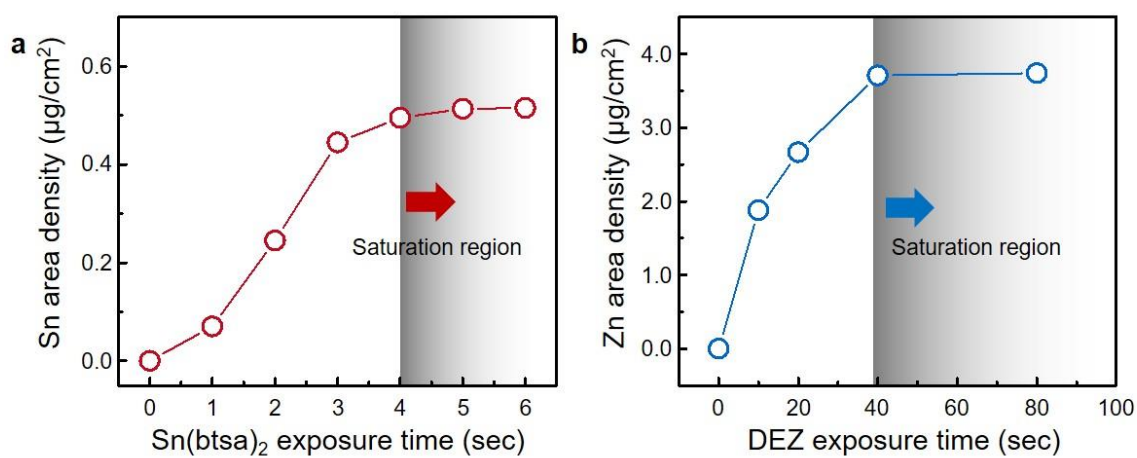
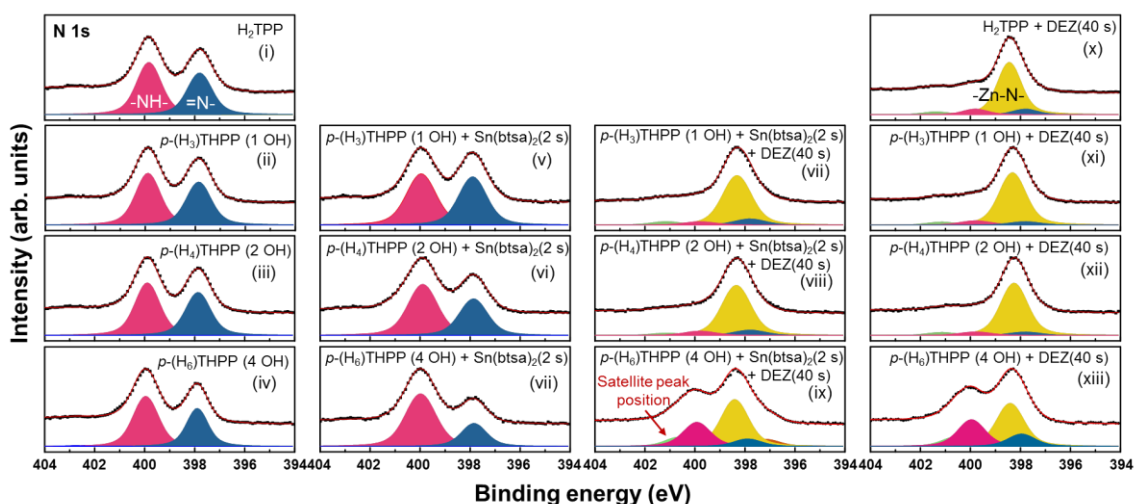
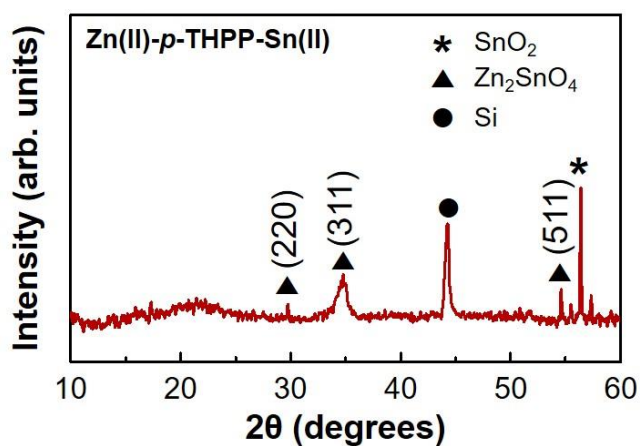


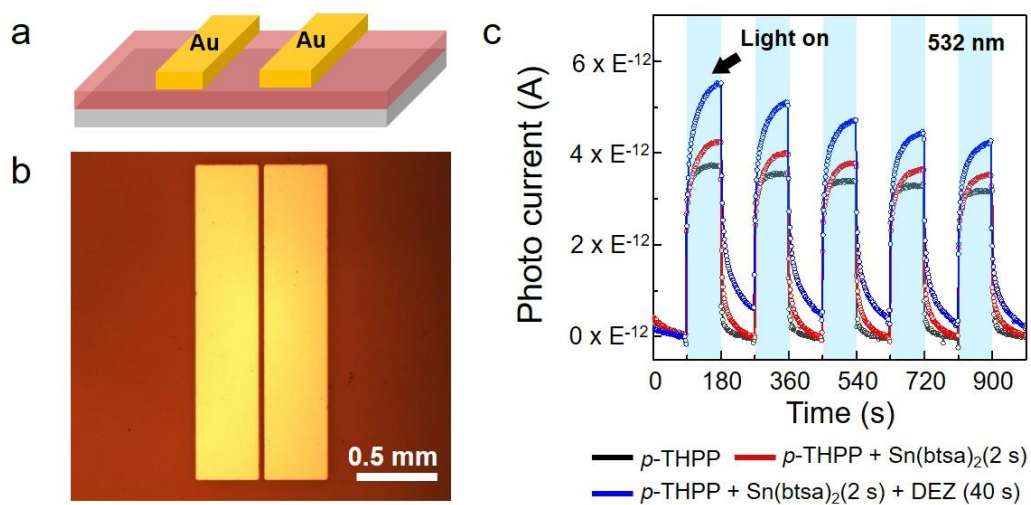
Fig. S3. The area density of (a) Sn and (b) Zn by Sn(btssa)<sub>2</sub> and DEZ precursors exposure time.



**Fig. S4.** XPS spectra of N 1s core level for (i) H<sub>2</sub>THPP, (ii)-(iv) *p*-(H<sub>6</sub>)THPP thin film, (v)-(vii) *p*-(H<sub>2</sub>)THPP-Sn(II), (vii)-(ix) Zn(II)-*p*-THPP-Sn(II) hybrid thin film, (x) Zn(II)-THPP and (xi)-(xiii) Zn(II)-*p*-THPP hybrid thin films as a function of the number of hydroxyl groups (1 OH, 2 OH and 4 OH) on the phenyl rings of the porphyrin.



**Fig. S5.** XRD analysis of Zn(II)-*p*-THPP-Sn(II) film.



**Fig. S6.** (a) Schematic illustration and (b) an optical image of the *p*-THPP, *p*-THPP-Sn(II) and Zn(II)-*p*-THPP-Sn(II) based devices. (c) The real-time cyclic photocurrent of *p*-THPP thin film (black line), *p*-THPP-Sn(II) (red line) and Zn(II)-*p*-THPP-Sn(II) (blue line) hybrid thin film devices under 532 nm illumination light.