Electronic Supplementary Information

Earth-abundant and low-cost CZTS solar cell on flexible molybdenum foil

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Characterizations and measurements

X-ray power diffraction (XRD) measurements were carried out on a Shimadzu XRD diffractometer with Cu K_α radiation. Raman spectra were recorded on a microscopic confocal Raman spectrometer (Labram HR 800) with an excitation of 514 nm laser light. The morphologies and compositions of the samples were observed using a Hitachi S5200 field emission scanning electron microscope (SEM) equipped with Bruker energy dispersive spectroscopy. Current-voltage (*I-V*) measurements were performed using a Keithley 2400 General Purpose Sourcemeter under simulated AM 1.5G illumination (100 mW cm^{-2}). External quantum efficiency (EQE) was collected by the EQE Measurement System (Continuous Solar Simulator for PV Cells, Hong-ming Technology Co., Ltd.).

Figure Captions

Table S1. Composition analysis and composition ratios of Cu-Zn-Sn precursors					
Sample	Cu(at%)	Zn(at%)	Sn(at%)	Cu/(Zn+Sn)	Zn/Sn
Cu-Zn-Sn precursors	43.99	30.20	25.81	0.79	1.17

The composition ratios of Cu/(Zn + Sn) and Zn/Sn are 0.79 and 1.17 respectively, which yields Cu-poor and Zn-rich.

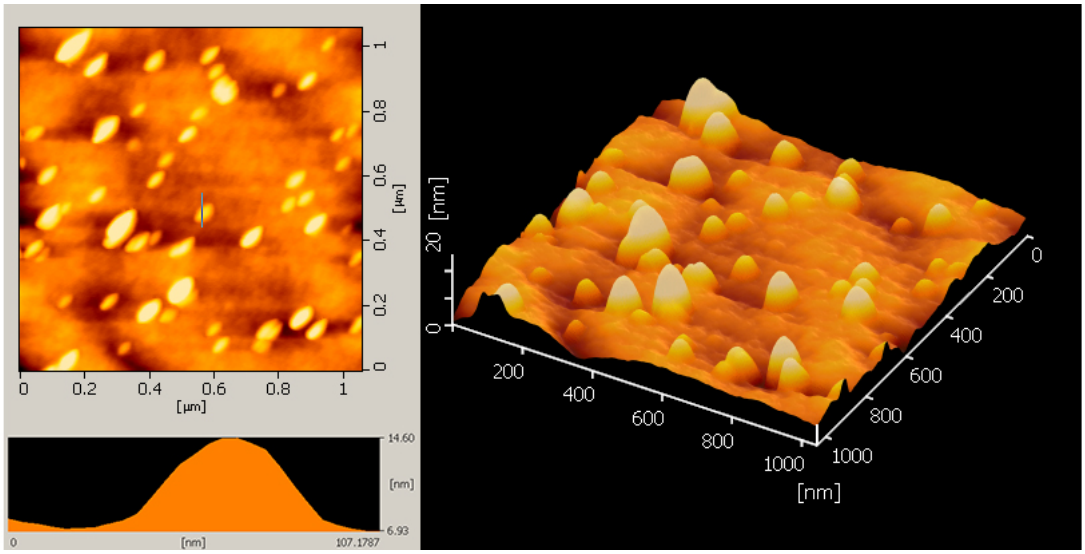

Fig. S1 AFM image of post-polished molybdenum foil.

The surface morphology of foil is found to be smooth with an average roughness of ~10 nm in most regions. An AFM 3D micrograph of foil surface shows that height between lowest feature and highest feature is ~20 nm.

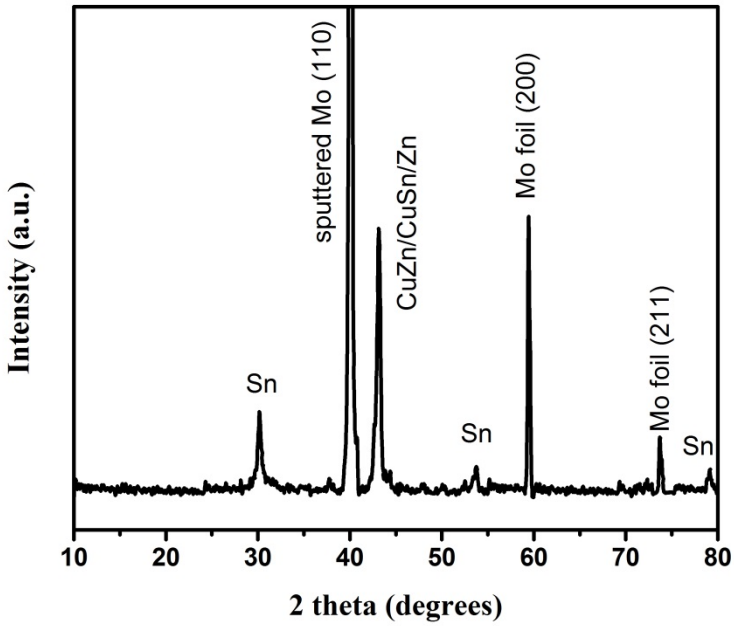

Fig. S2 X-ray powder diffraction (XRD) patterns of Cu-Zn-Sn precursors.

The peaks correspond to alloy phases, where corresponding XRD patterns of Sn, Zn, CuZn, and CuSn phases are observed, which can be confirmed by JCPDS #65-7657, #65-9743, #65-9061, #65-3433 and #52-1228, respectively.