

Fig. (S-1) Schematic of counter electrode fabrication and dye sensitized solar cell.



Fig. (S-2) Cyclic Voltammetry curves of the  $CuInS_2/PEDOT:PSS$  counter electrode at 20-120 mVs<sup>-1</sup> scan rate from -1.0 to 1.5 V in electrolyte solution consists of 1mM I<sub>2</sub>, 10 mM LiI, and 100

mM LiClO<sub>4</sub> in acetonitrile with Ag/AgCl and Platinium wire as a working, reference and counter electrode.

FTIR spectrum in the region between 650 and 2500 cm<sup>-1</sup> was performed to investigate the surface functionality of the CuInS<sub>2</sub> NPs. The peak vibrations at 1184 cm<sup>-1</sup> predict the presence of the epoxy group. Further, the peaks vibrations found at 1108 cm<sup>-1</sup> are also noticeable at higher indicate S-O stretching.

