

Supporting Information

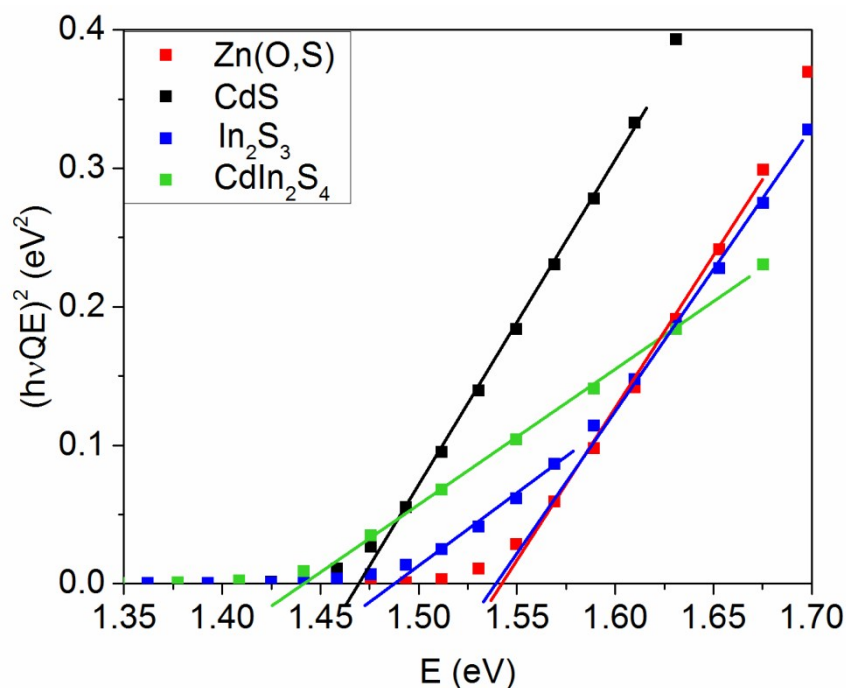


Figure S1: Plot of the squared EQE versus the energy for solar cells with CZGSse absorber and the buffer materials Zn(O,S), CdS,  $\text{In}_2\text{S}_3$  and  $\text{CdIn}_2\text{S}_4$ . The estimated band gaps are indicated by the drawn lines, which are 1.44 eV for the absorber with a  $\text{CdIn}_2\text{S}_4$  buffer, 1.47 eV for CdS, and 1.54 eV for Zn(O,S). For the absorber with  $\text{In}_2\text{S}_3$  buffer the plot has two linear regimes, thus only a band gap range between 1.49 and 1.54 eV can be given.

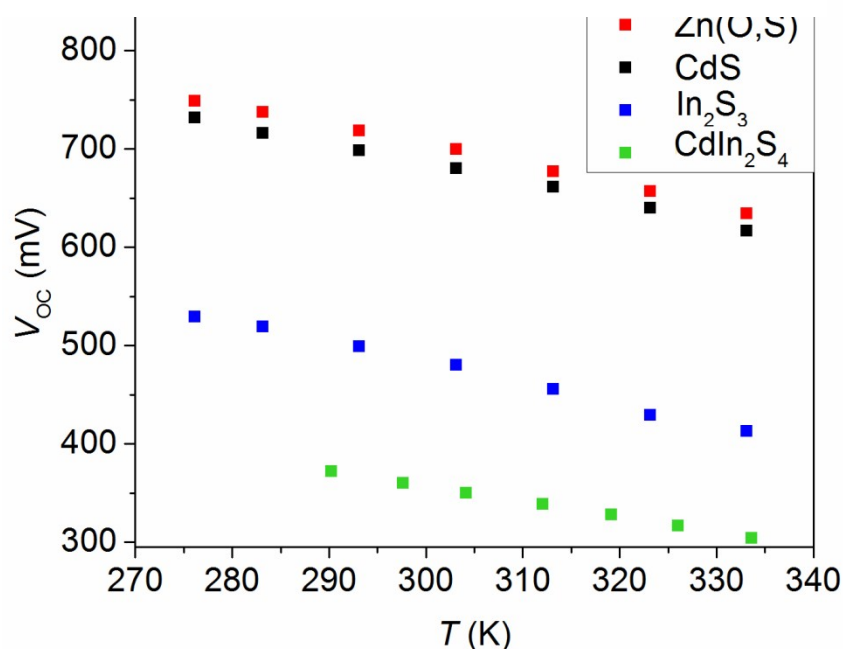


Figure S2: Plot of the  $V_{\text{OC}}$  versus temperature for solar cells with different buffer materials. The extrapolation to 0 K yields activation energies of 1307 meV for Zn(O,S), 1277 meV for CdS, 1115 meV for  $\text{In}_2\text{S}_3$  and 820 meV for  $\text{CdIn}_2\text{S}_4$ , respectively.