Measurement of SnSe/Zn(O,S) heterojunction band discontinuities by PYS

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Earth-abundant material of SnSe films is a promising material for photovoltaic applications due to its direct band gap of 1.1 eV with high absorption coefficient of 105 cm-1 and p-type semiconductor nature. However, the reported efficiency these cells is extremely low (<2.5%). One of the reason for these poor efficiency is mainly due to an unfavorable conduction-band offset (CBO). So that, we present an investigation of the interface between SnSe and Zn(O,S) using photoelectron yield spectroscopy (PYS) as the probing technique. SnSe films were grown by two-stage process and Zn(O,S) layer was deposited on the SnSe films by chemical bath deposition. The interfacial band alignment the SnSe/Zn(O,S) heterointerface was evaluated by PYS. The valence-band offset and conduction-band offset is determined for SnSe/Zn(O,S) junction with O/S ration. The related energy band diagram was developed and the obtained results discussed with more elaborated manner.