

Supporting Information

HTL-free $\text{Sb}_2(\text{S,Se})_3$ Solar Cells: Unveiling the Role of Dual Grading in Device Optimization

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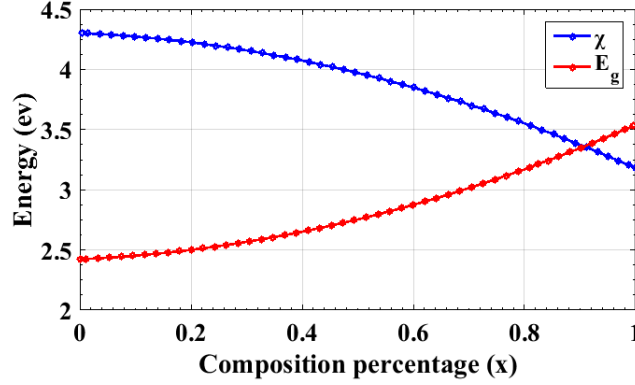


Figure S1 Variation of electron affinity and energy bandgap with the Zn composition of $\text{Cd}_{1-x}\text{Zn}_x\text{S}$.

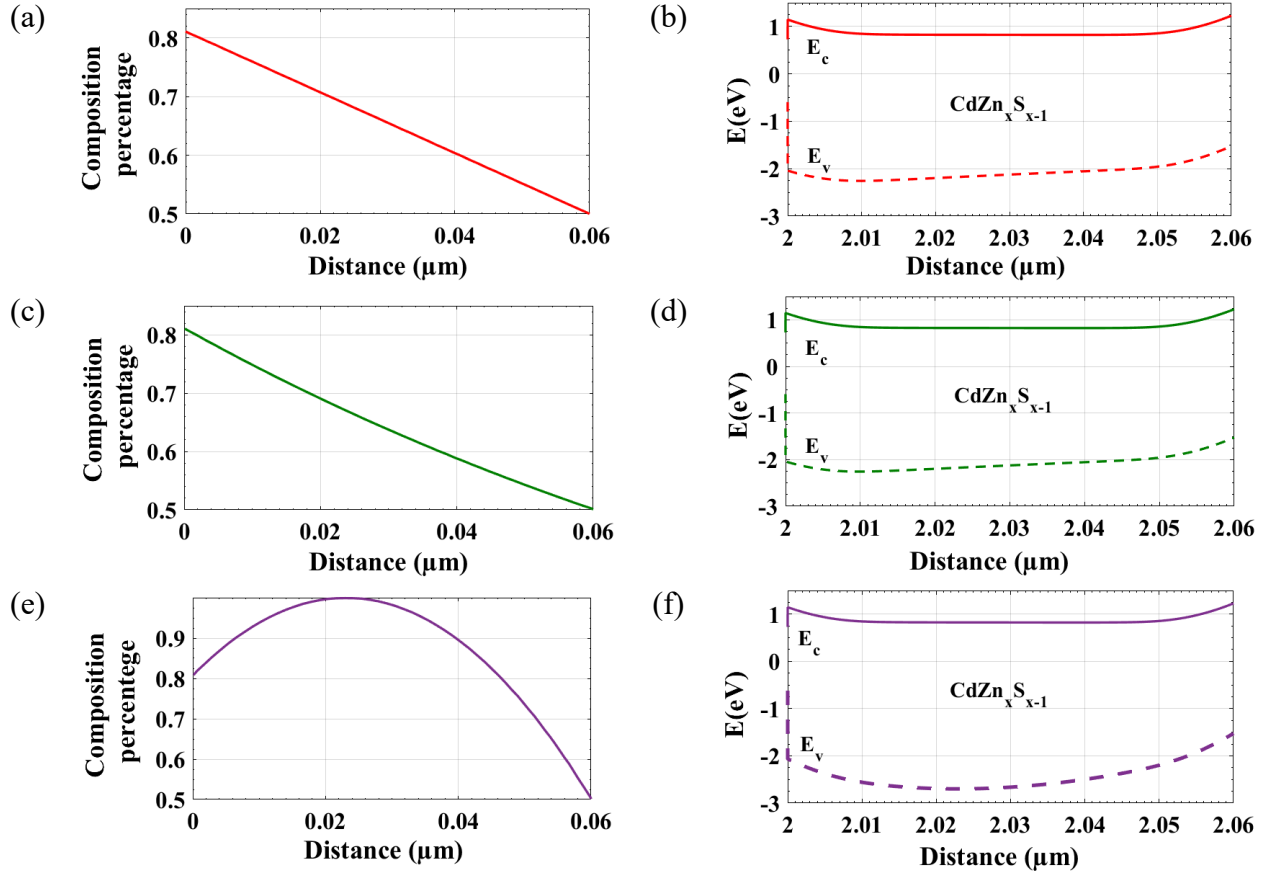


Figure S2 Different grading profiles of the Zn composition of $\text{Cd}_{1-x}\text{Zn}_x\text{S}$ with position in the layer: (a) linear, (c) logarithmic and (e) negative parabolic, The energy band gap diagram in the three grading profiles: (b) linear, (d) logarithmic and (f) negative parabolic.

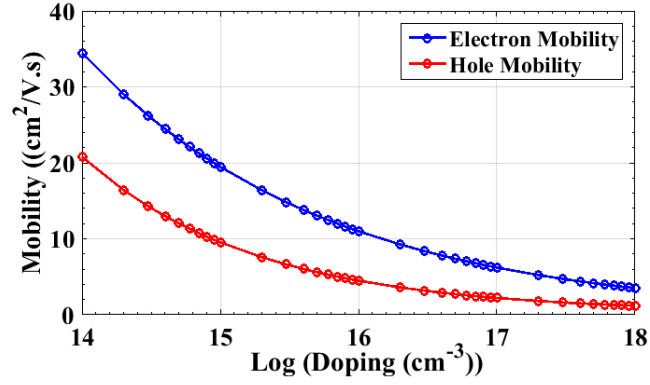


Figure S3 $\text{Sb}_2(\text{S,Se})_3$ electron and hole mobility versus doping concentration.

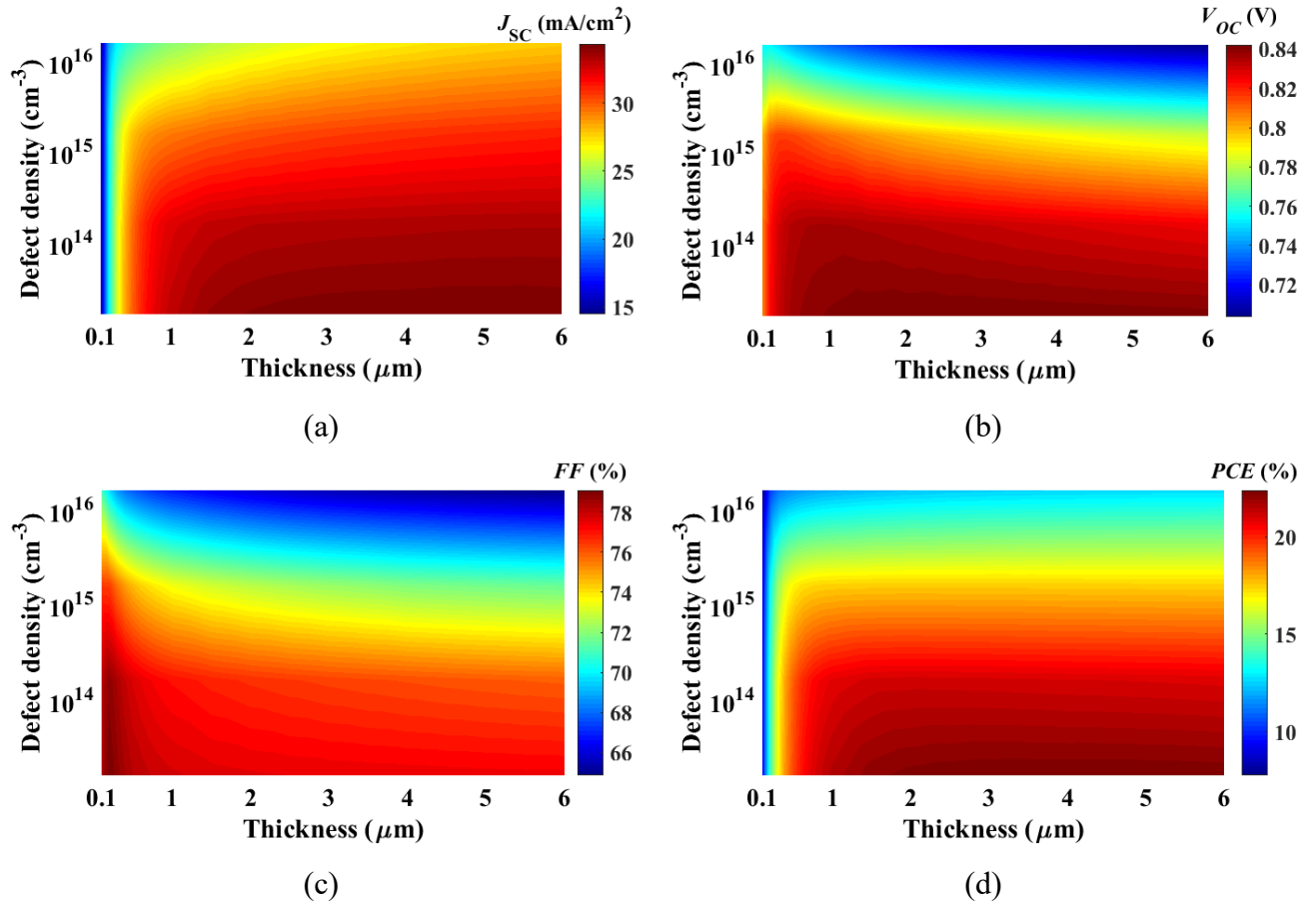


Figure S4 Contour of PV parameters variation at different thicknesses and bulk defect densities of absorber (a) J_{sc} , (b) V_{oc} , (c) FF, and (d) PCE.