

Supplementary Information

Ammonia-free chemical-bath-deposited ZnS(O,OH) buffer layer for flexible Cu(In,Ga)Se₂ solar cell application: an eco-friendly approach achieving improved stability

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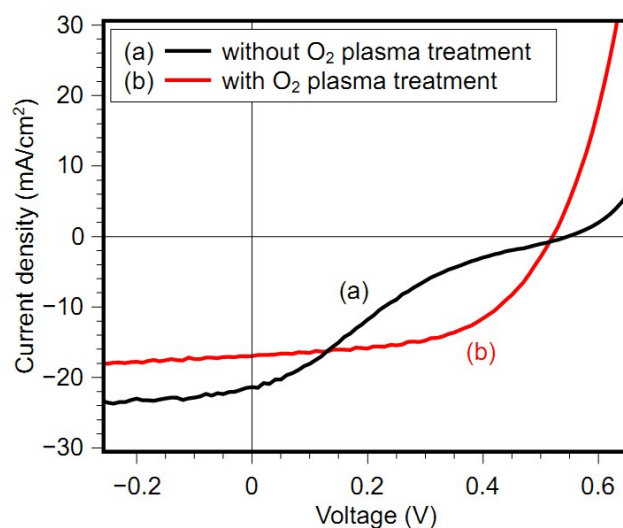


Fig. S1 *J-V* characteristics of devices with 20nm-thick ammonia-free CBD-ZnS(O,OH) (a) without and (b) with oxygen plasma treatment. Without oxygen plasma treatment, the solar cell exhibited significant current-blocking behavior due to the high S/S+O ratio in the film. After oxygen plasma treatment, the CBO at the CIGS/ZnS(O,OH) interface was reduced so the current blocking behavior became less evident.

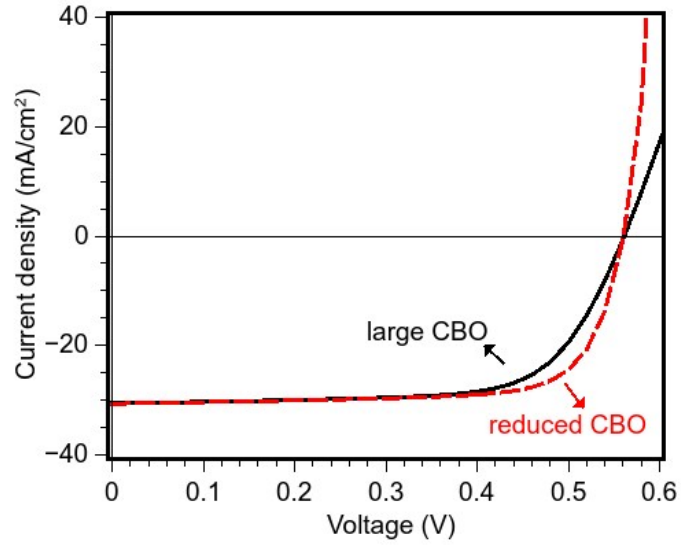


Fig. S2 Simulated J - V curves based on the band diagrams shown in Fig. 6c. Larger conduction band offset (CBO) at the CIGS/buffer interface results in a larger series resistance. A reduced CBO results in a smaller series resistance and improved FF , consistent to our experimental observation. The simulation was done by using SCAPS [1].

[1] M. Burgelman, P. Nollet and S. Degraeve, Thin Solid Films, 2000, 361–362, 527–532.