

## Supporting Information

### Enhanced Solar Performance of Chemical Bath Deposited-Zn(O,S)/Cu(In, Ga)Se<sub>2</sub> Solar Cell via Interface Engineering by Wet Soaking Process

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Figure S1 shows the schematic of CIGS structure with Al (300 nm)/ITO (550 nm)/ZnO (70 nm)/ CBD-ZnS (15 nm)/ post-selenization CIGS (1200 nm)/ CBD-Zn(O,S) (15nm)/Mo (400 nm). In Figure.S2, We can clearly see that gallium concentration have increased after soaking process and there are no signals of sulfur. We can confirm that the enhanced performances are not dedicated by sulfurization. Comparing the soaking time of 20 and 30 seconds, the decreased cell performance has been found due to the excess gallium diffusion inside the CIGS film. This material is available free of charge via the Internet at <http://pubs.acs.org>.

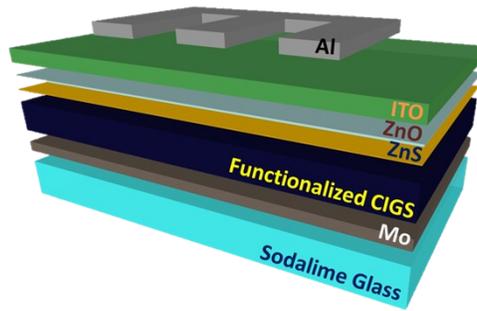


Figure S1. Illustration of CIGS solar cell structure.

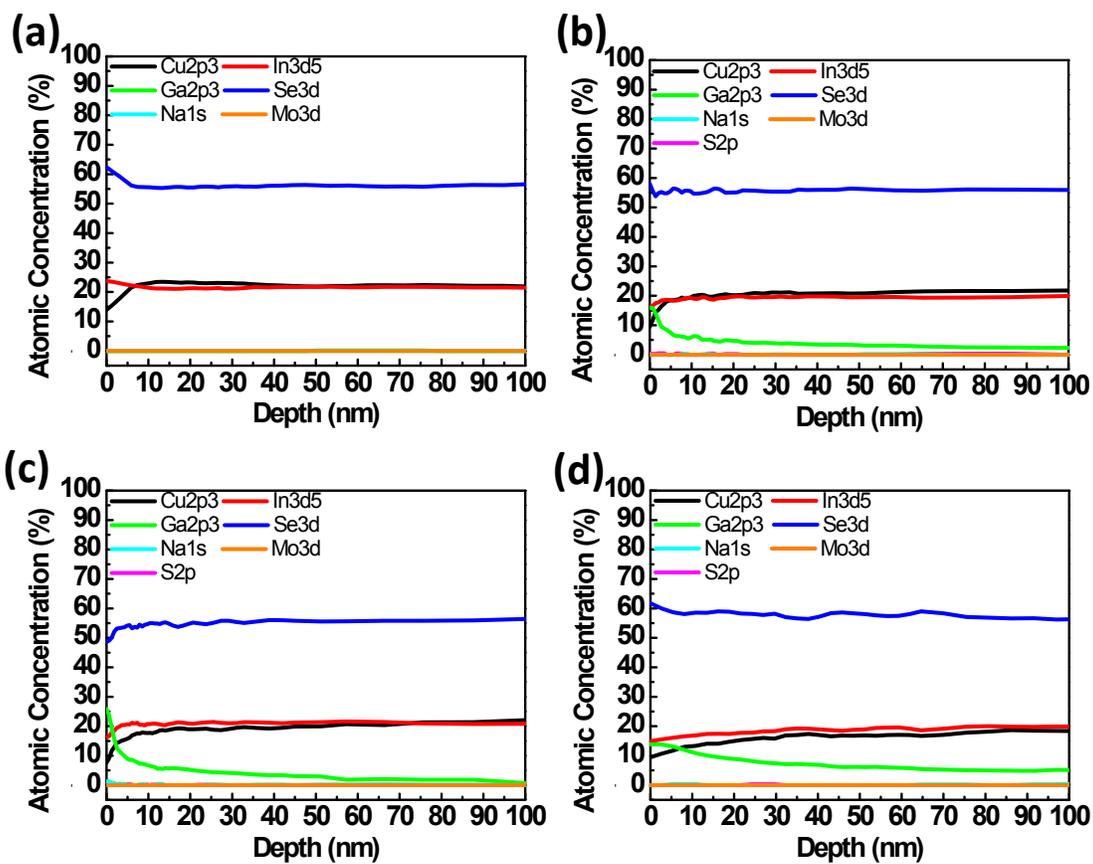


Figure S2 **a**, pristine CIGS film and the CIGS films after soaking for **b**, 10 seconds **c**, 20 seconds and **d**, 30 seconds.

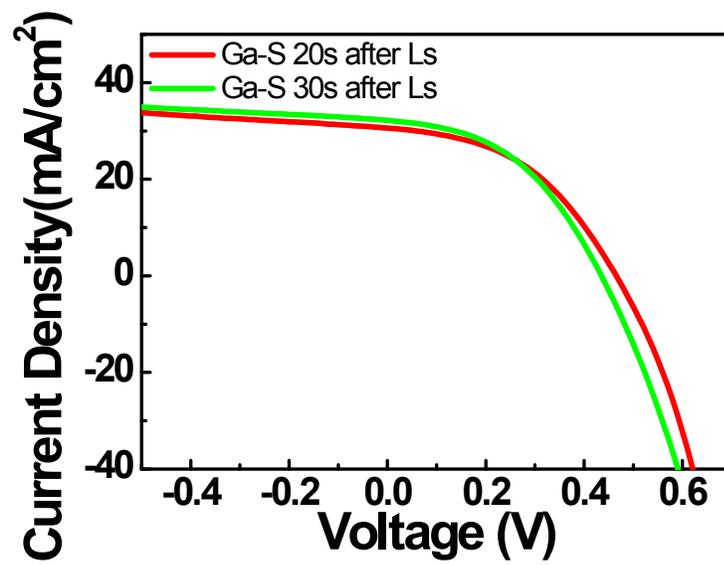


Figure S3 I-V curves for CIGS film after wet process (black curve) and light soaking processes (red curve).