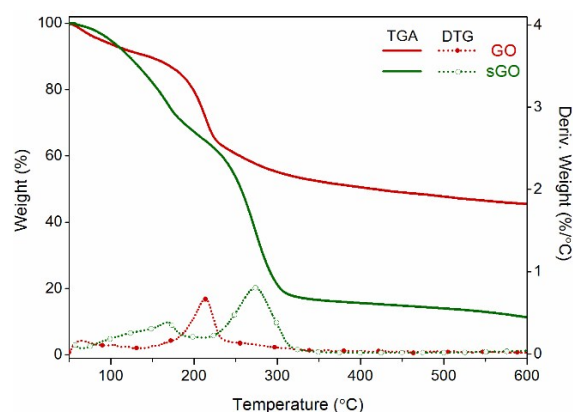


# Efficiency enhance in inverted planar perovskite solar cells by synergetic effect of sulfated graphene oxide (sGO) and PEDOT:PSS as hole transporting layer

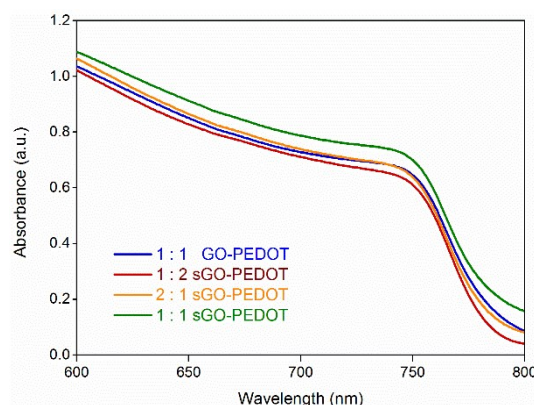
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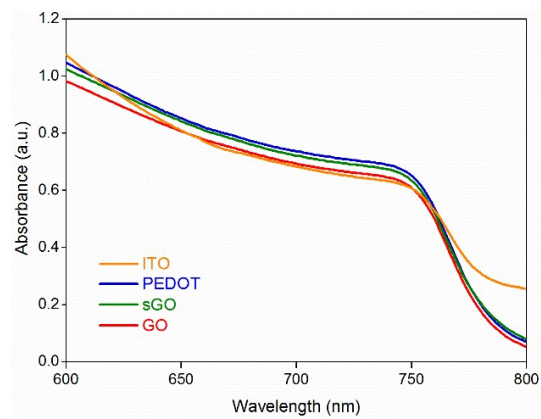


**Fig. S1** TGA and DTG curves of GO and sGO powders.

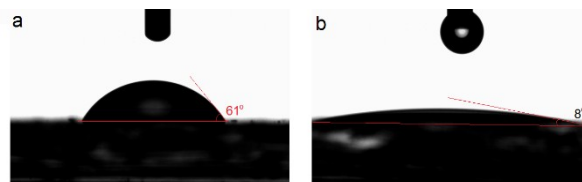


**Fig. S2** UV-vis spectra of CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> perovskite on different composite HTLs.

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**Fig. S3** UV-vis spectra of  $\text{CH}_3\text{NH}_3\text{PbI}_3$  perovskite on different HTLs.



**Fig. S4** Water contact angles of ITO-coated glass without (a) and with (b) 15 min of UV-zone treatments