

**Electronic Supplemental Information for:**

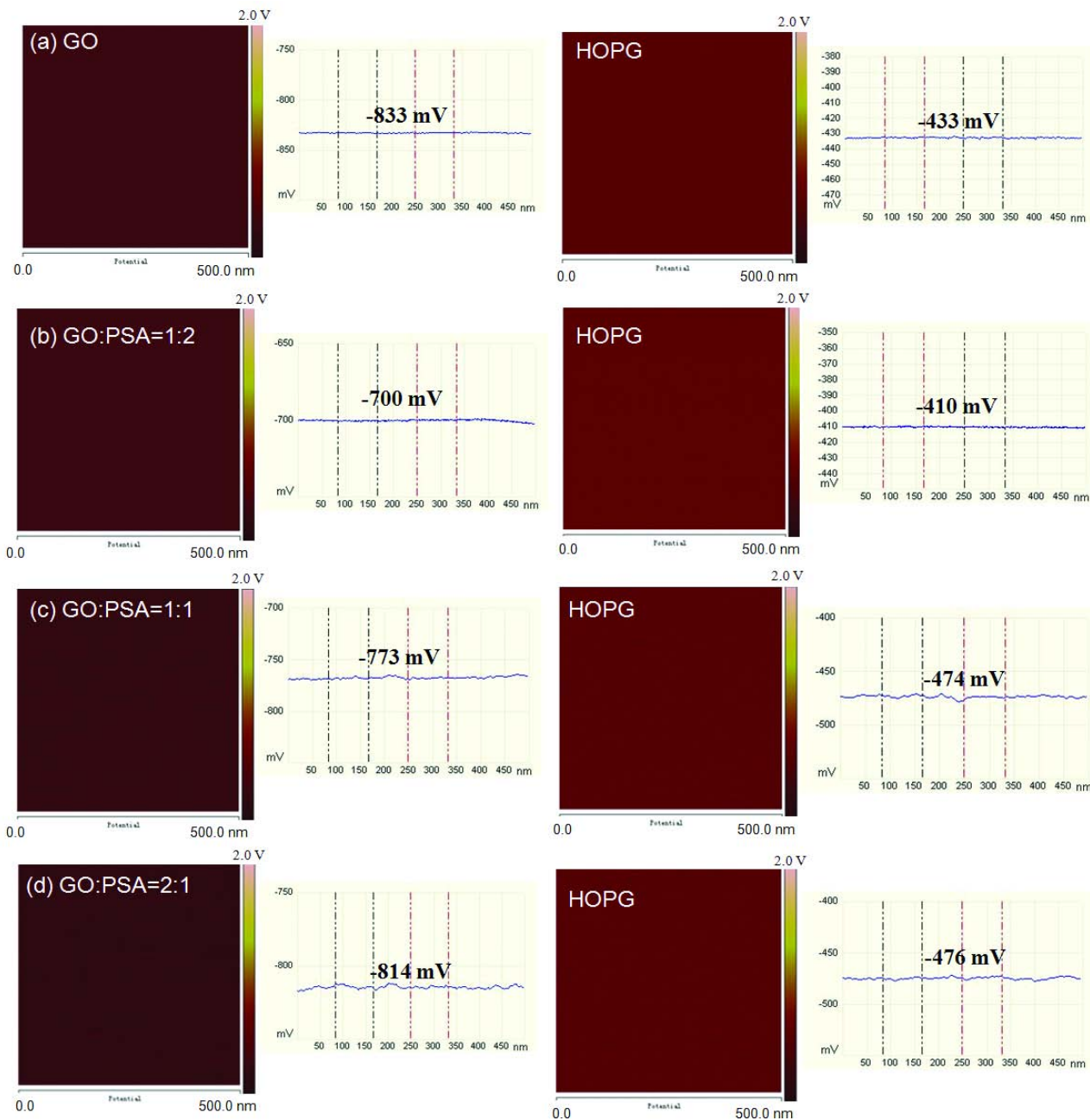
**Noncovalently grafting sulfonic acid onto graphene oxide toward  
improved hole transport in polymer solar cells**

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**Fig. S1.** Surface potential images of GO-PSA HTLs with different GO:PSA ratio of 1:2 (b), 1:1 (c) and 2:1 (d) in comparison with that of pristine GO (a). To ensure the accuracy eliminating the influence of the tip, the surface potential image of the individual HOPG used in the corresponding measurement in (a)-(d) was measured prior to the sample measurement, and their images are shown in the right panels of (a)-(d).

**Table S1.** The surface potentials and work functions of different GO-PSA HTLs.

|   | reference |                   | GO-PSA <sup>a</sup> |                   |            |                   |            |                   |
|---|-----------|-------------------|---------------------|-------------------|------------|-------------------|------------|-------------------|
|   | GO        | HOPG <sup>b</sup> | GO:PSA=1:2          | HOPG <sup>a</sup> | GO:PSA=1:1 | HOPG <sup>b</sup> | GO:PSA=2:1 | HOPG <sup>b</sup> |
| Surface potential (SP, mV)                | -833      | -433              | -700                | -410              | -773       | -474              | -814       | -476              |
| $\Delta$ SP <sup>c</sup>                  | -400      |                   | -290                |                   | -299       |                   | -338       |                   |
| Work function <sup>d</sup> ( $\Phi$ , eV) | 5.00      | 4.60              | 4.89                | 4.60              | 4.90       | 4.60              | 4.94       | 4.60              |

<sup>a</sup> PSA was added with variable weight ratios (2:1, 1:1, 1:2, w/w) into the GO dispersions in DI water with fixed concentration of 0.20 wt%;

<sup>b</sup> HOPG (highly oriented pyrolytic graphite) was used as a reference with the work function of 4.6 eV;

<sup>c</sup>  $\Delta$ SP is surface potential change of sample relative to HOPG.  $\Delta$ SP=SP(sample) – SP(HOPG);

<sup>d</sup>  $\Phi = \Phi_0 - e\Delta$ SP, where  $\Phi_0$  is the work function of HOPG (4.6 eV).