

Electronic Supplementary Information

## Supramolecular ionic liquid based on graphene oxide

Chunfang Zeng<sup>a</sup>, Zhenghai Tang<sup>a</sup>, Baochun Guo<sup>\*a,c</sup> and Liquan Zhang<sup>\*b</sup>

*a* Department of Polymer Materials and Engineering, South China University of Technology, Guangzhou 510640, China. E-mail: pscguo@scut.edu.cn; Fax: +86 20 22236688; Tel: +86 20 87113374

*b* Key Laboratory of Beijing City for Preparation and Processing of Novel Polymer Materials, Beijing University of Chemical Technology, Beijing 100029, China. E-mail: zhanglq@mail.buct.edu.cn; Fax: +86 1064421186; Tel: +86 10 64421186

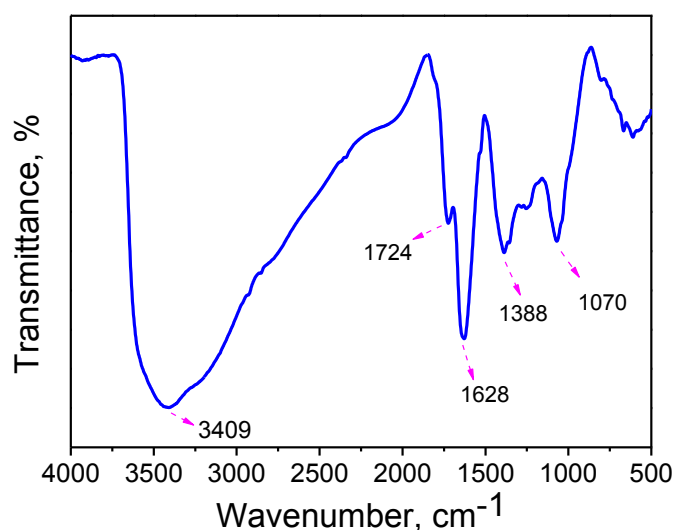
*c* State Key Laboratory of Pulp and Paper Engineering, South China University of Technology, Guangzhou 510640, China

### Experimental Procedure:

Sodium metanitrobenzene sulphonate (SMS) was purchased from Shanghai Chemical Reagent Co. Ltd and used without further purification. 200 mg GO was exfoliated in 200 mL deionized water under sonication to yield GO aqueous suspension. And then 600 mg SMS aqueous was mixed with the obtained GO suspension. The mixture was stirred at 80 °C for 12 hour. The reactants were then washed repeatedly with de-ionized water to remove “excess” SMS, and the resultant was designated as GO-SMS.

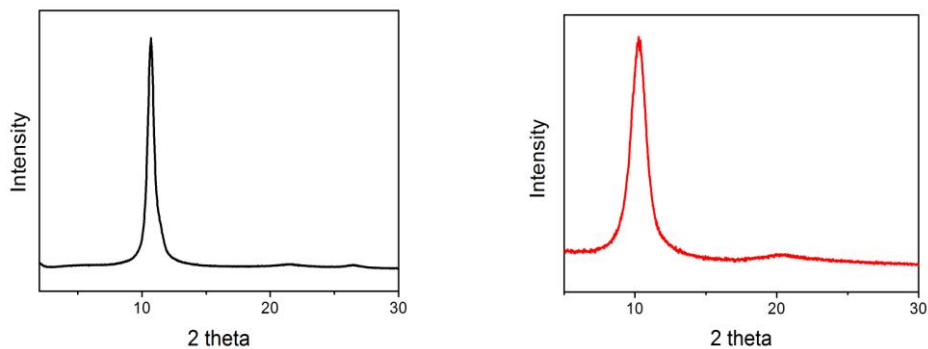
### Supporting figures and discussion

Figure S1 shows the FTIR spectrum of the GO-SMS. The peaks at about 1724 cm<sup>-1</sup>, 1628 cm<sup>-1</sup>, 1388 cm<sup>-1</sup> and 1070 cm<sup>-1</sup> are ascribed to -C=O, C=C, C-OH and C-O-C, respectively. All these absorptions are originated from GO, and no peaks of either -NO<sub>2</sub> or -SO<sub>3</sub><sup>-</sup> are detected. It is shown that during the washing process, all of physically adsorbed organic unit can be removed. Further, one can conclude that the characteristic absorptions of sodium sulfanilate unit in GO-SIL can be attributed to the covalent grafting, instead of physical absorption.



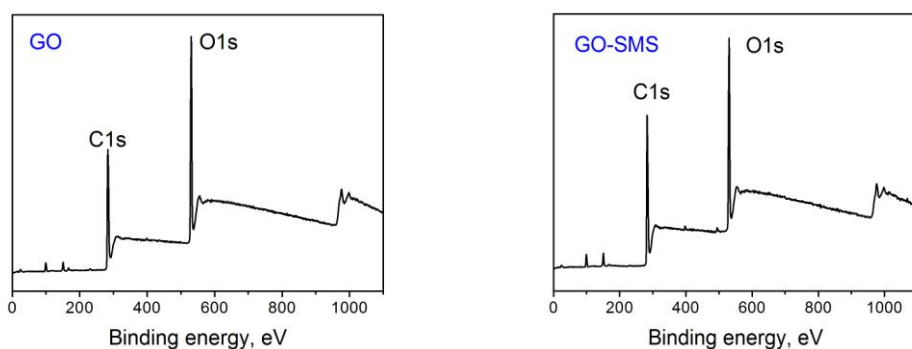
**Fig.S1** FTIR spectra of the GO-SMS

XRD was performed to examine whether there are any microstructure change compared to GO. As shown in Figure S2, the GO-SMS shows a peak at about 10.2 °, corresponding to  $d_{001}$  values of about 0.86 nm. This is very similar to the XRD values of GO alone, which further confirmed that SMS can be washed away.



**Fig.S2** XRD pattern of the GO (Left) and GO-SMS (Right)

XPS of GO and GO-SMS were shown in Figure S3, the two spectra are almost the same to each other, and the elements that only associated with SMS cannot be detected in GO-SMS.



**Fig.S3** XPS of the GO and GO-SMS

In conclusion, from the above results of IR, XRD, and XPS, one can conclude that the free or physical absorption organic unit can be totally washed.