Electronic supplementary information

Graphene oxide-based benzimidazole-crosslinked networks for high-performance supercapacitor

Yi Cui, Qian-Yi Cheng, Haiping Wu, Zhixiang Wei,* Bao-Hang Han*

National Center for Nanoscience and Technology, Beijing 100190, China

Tel: +86 10 8254 5576. Email: hanbh@nanoctr.cn

Tel: +86 10 8254 5565. Email: weizx@nanoctr.cn.

Preparation of GOBIN$_{PPA}$

To the PPA (20 mL) that was heated to 130 °C with stirring for 1 h under nitrogen atmosphere, GO (36 mg) was added and homogeneously dispersed under nitrogen atmosphere with stirring for 3 h. 3,3'-Diaminobenzidine (43 mg) or 1,2,4,5-benzenetetraamine tetrahydrochloride (28 mg) was then added. The mixture was heated to 190 °C with stirring for 72 h under nitrogen atmosphere. The product (denoted as GOBIN$_{PPA}$) was collected by filtration and washed with water, ethanol, and acetone, and then dried at 70 °C for 12 h.

The sGOBIN$_{PPA}$ was synthesized with the identical procedure to the above, except employing the sGO as the reaction reagent.

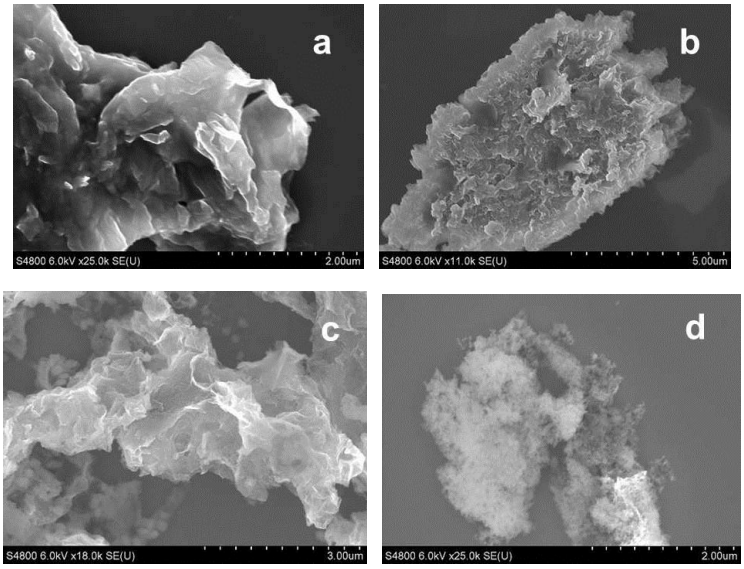

Figure S1. SEM images of GOBIN-1_{DMF} (a), sGOBIN-1_{DMF} (b), GOBIN-1_{PPA} (c), and sGOBIN-1_{PPA} (d).

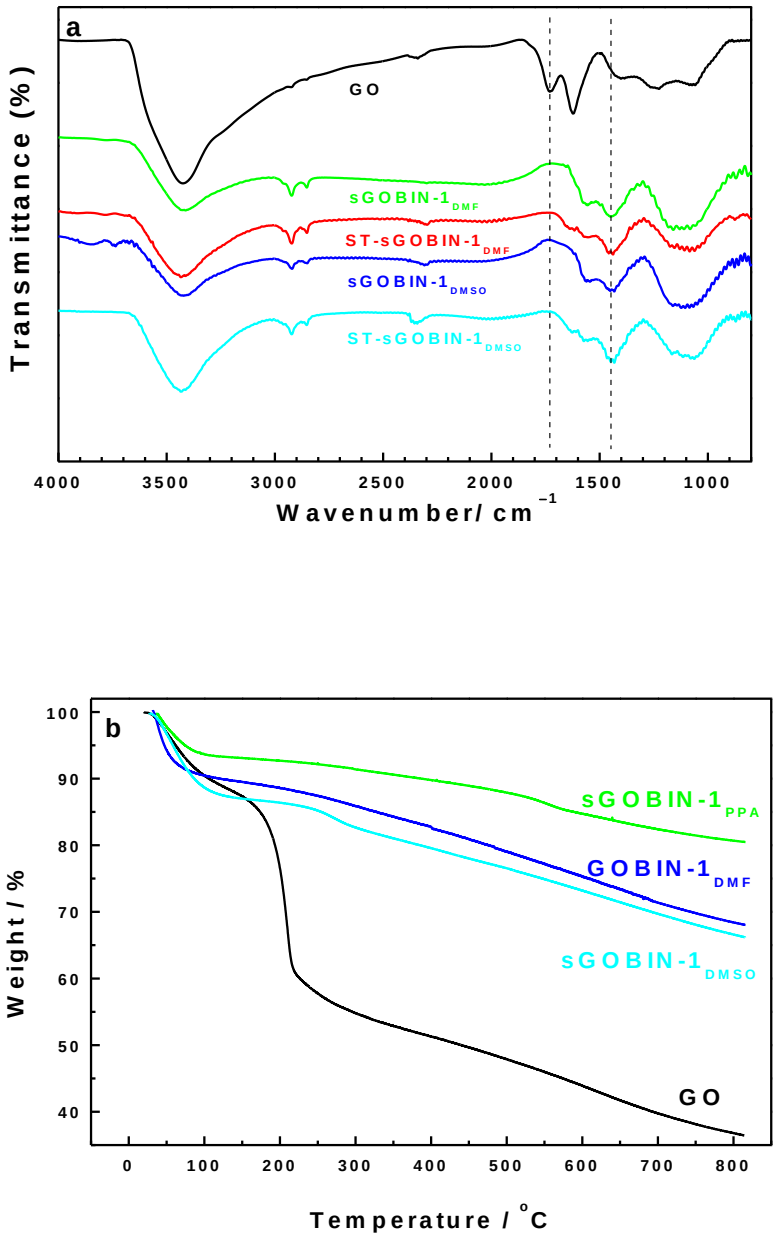

Figure S2. IR spectra (a) and TGA (b) of GO and GOBIN materials.

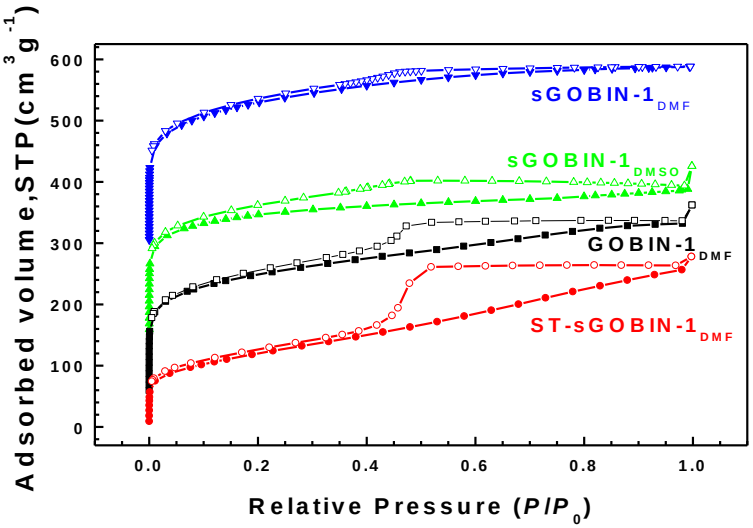

Figure S3. Nitrogen adsorption–desorption isotherms of GOBIN materials. The isotherms have been offset by 100 units for the purpose of clarity.

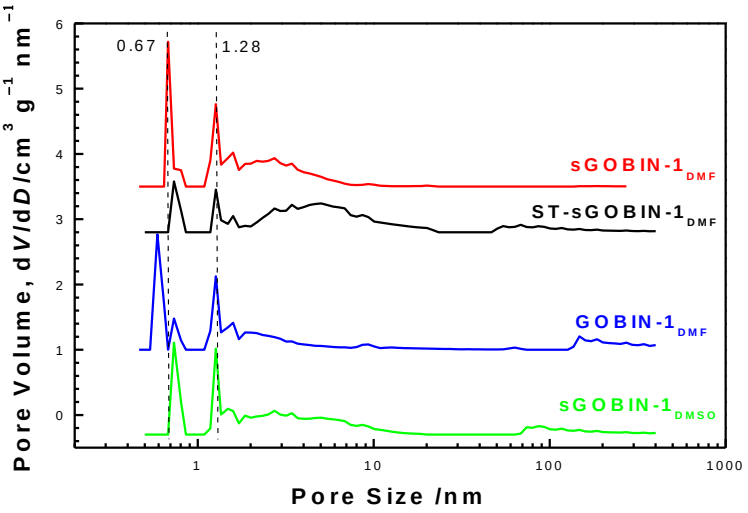

Figure S4. Pore size distribution calculated by the original DFT method of the GOBIN materials. The curves have been offset by 1 unit for the purpose of clarity.

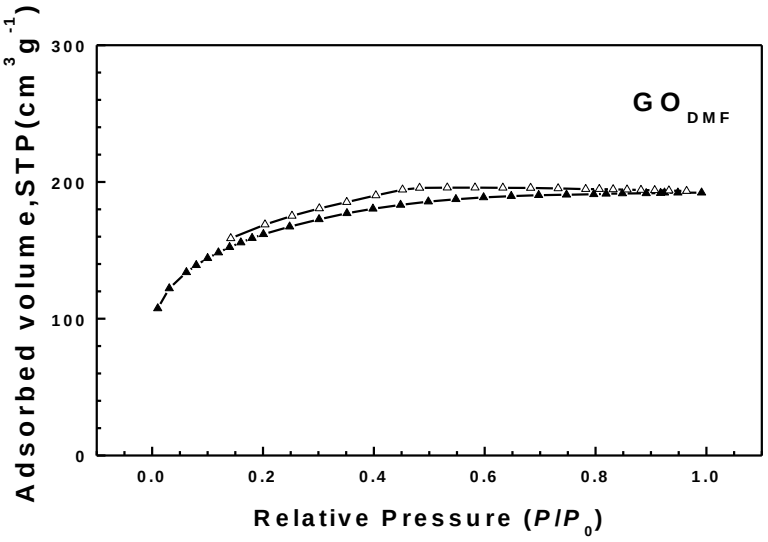

Figure S5. Nitrogen adsorption–desorption isotherms of GO_{DMF}.

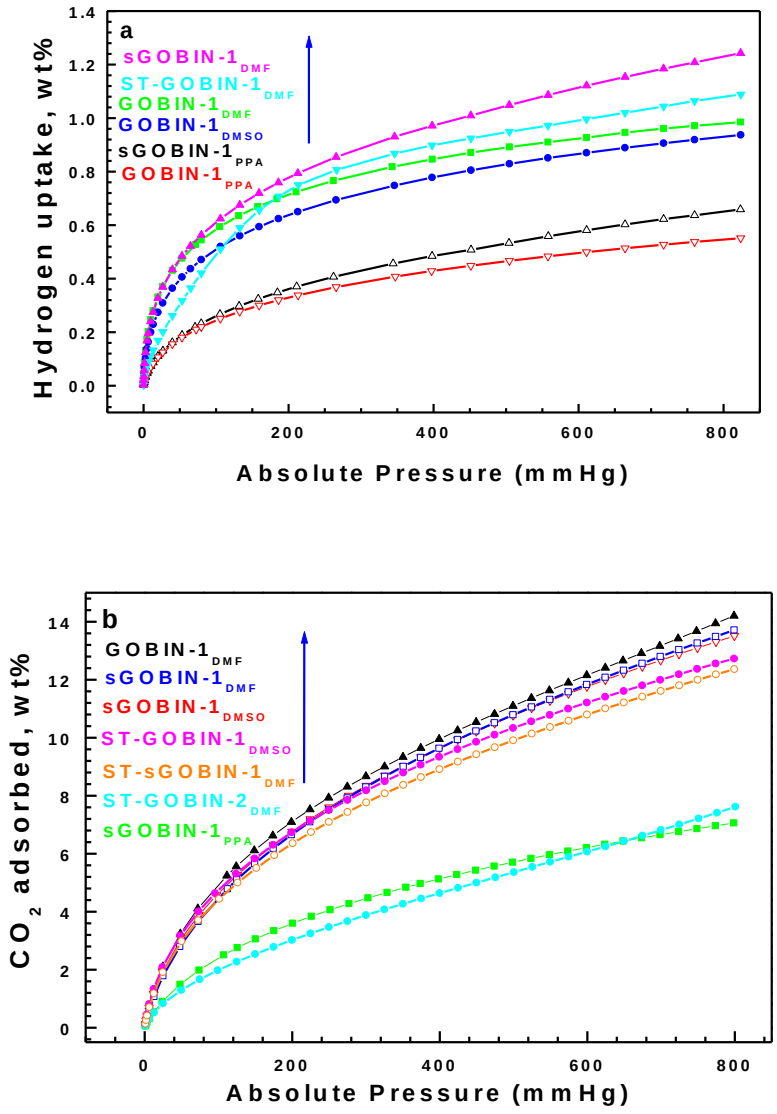

Figure S6. (a) Gravimetric hydrogen adsorption isotherms for GOBIN materials. (b) Gravimetric carbon dioxide adsorption isotherms for GOBIN materials.

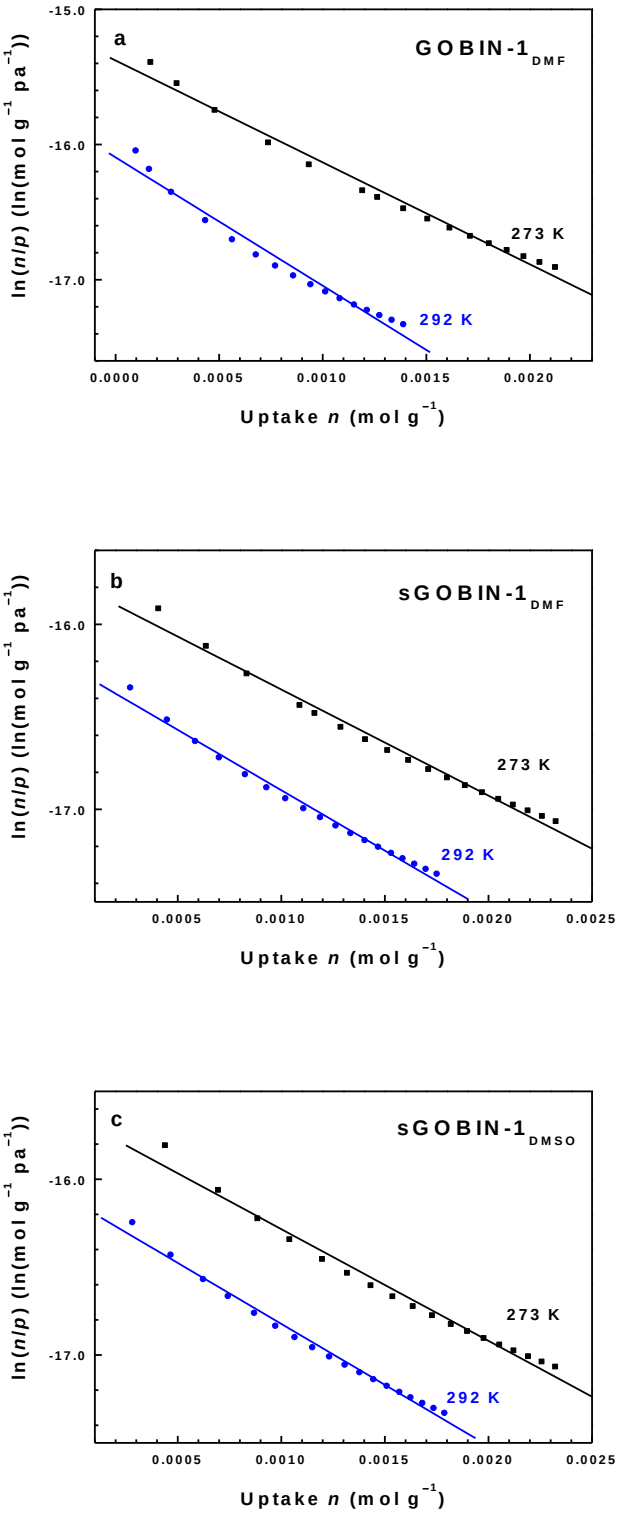

Figure S7. Virial analysis of the adsorption data for CO_2 of GOBIN-1_{DMF} (a), sGOBIN-1_{DMF} (b), and sGOBIN-1_{DMSO} (c) at 273 and 292 K at low pressure range.