Supplementary Information

Title Edge-enriched, Porous Graphene Nanoribbons for Supercapacitors with High Energy Density

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Experiment of synthesizing activated graphene

The precursor graphite oxide (GO) powers were prepared from the modified Hummer' method as described in Ref. 1. The synthesis of activated graphene followed the method described in Ref. 2 (as shown in **Figure S2a**). Briefly, brown GO powders were thermal annealed at 600 °C for 30 s. During the instant thermal treatment, a large volume expansion for GO powder occurred and the color became black. The chemical activation was carried out as following: the as-prepared reduced-GO (1.0 g) was mixed with KOH with a weight ratio of 1:8 and was chemically activated at 850 °C for 2 h in Ar atmosphere. The obtained sample was washed with 15 wt.% HCl solution and then washed to neutral with deionized water, finally, the sample was dried at 120 °C for 12 h. As a result, 0.40 g product obtained.

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Structural Characterizations

The as-prepared samples were characterized by a Hitachi S-4800 field emission scanning-electron microscopy (SEM) and a FEI Tecnai G^2 F20 transmission electron microscopy (TEM). The nitrogen sorption isotherm (BET) was recorded by a Micromeritics ASAP-2020 M nitrogen adsorption apparatus. Pore size distribution plot was obtained by the Barrett-Joyner-Halenda (BJH) method.

Electrochemical Tests

The electrochemical performances of as-prepared activated graphene were carried with the same method as mentioned in experimental section.

Figure S1. (a) Low magnification and (b) high-resolution SEM images of the pristine CNTs, (c) high-resolution TEM image of CNTs.

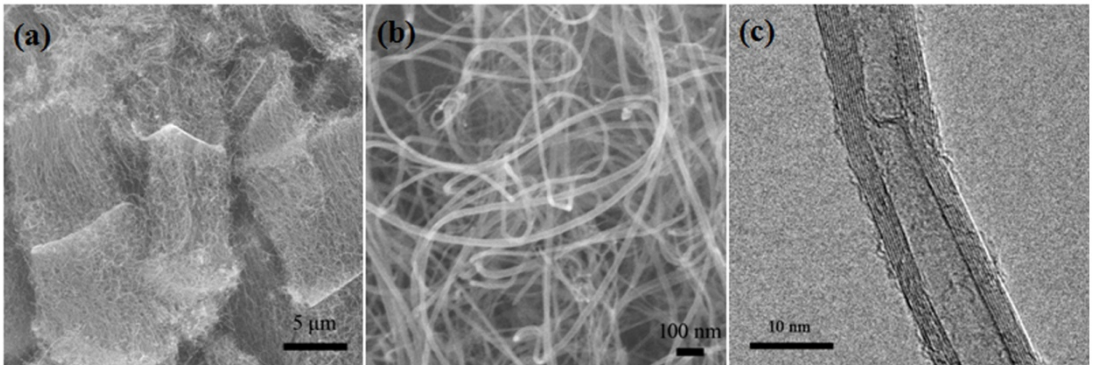


Figure S2. (a) Schematic illustration showing the process of synthesizing activated graphene. (b) Low magnification and (c) high magnification SEM images of activated graphen. (d) TEM image of activated graphene

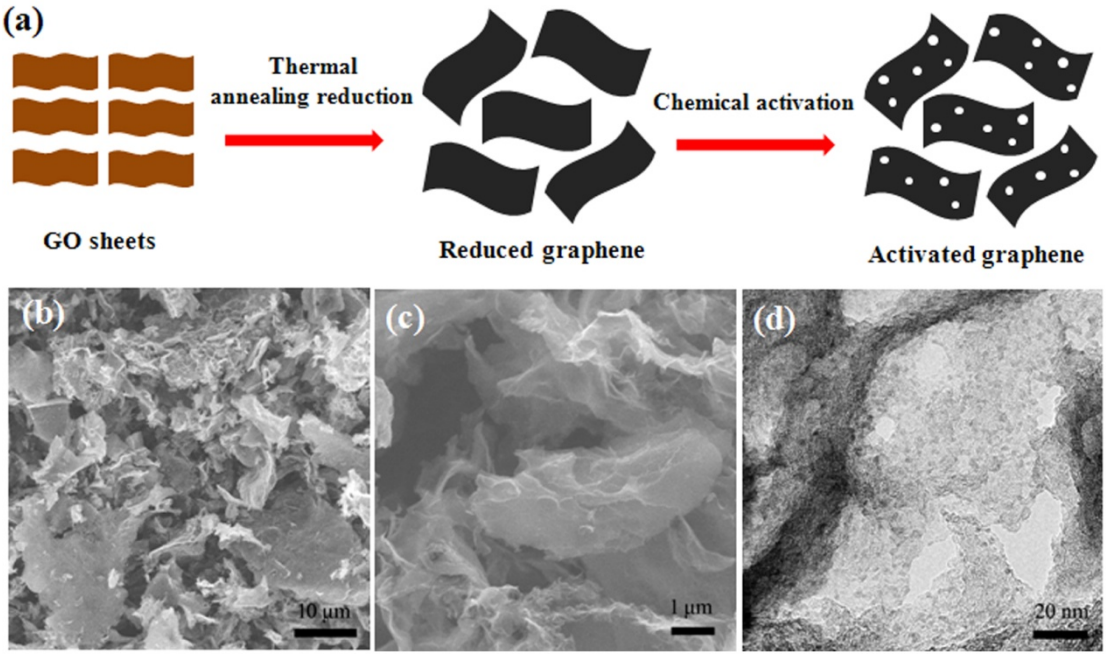
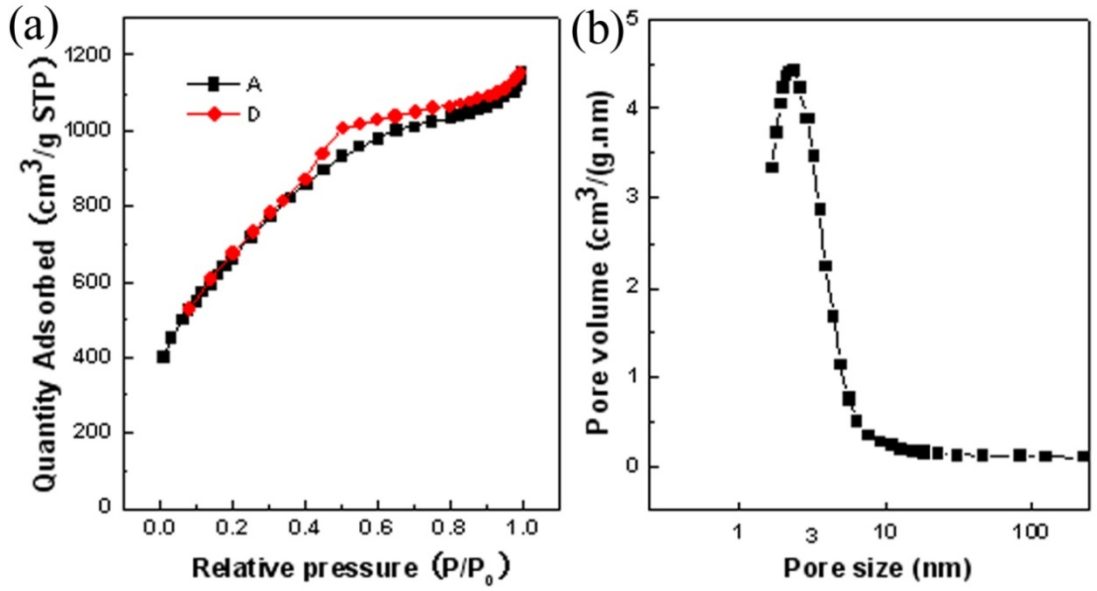


Figure S3. (a) Nitrogen adsorption/desorption isotherms of activated graphene, and (b) pore size distribution of activated graphene



References

1 X. F. Zhou and Z. P. Liu, *Chem. Commum*, 2010, **46**, 2611.

2 Y. W. Zhu, S. Murali, M. D. Stoller, K. J. Ganesh, W. W. Cai, P. J. Ferreira, A. Pirkle, R. M. Wallace, K. A. Cychosz, M. Thommes, D. Su, E. A. Stach, and R. S. Ruoff, *Science*, **332**, 1537.