Electronic Supplementary Material (ESI) for RSC Advances.

Growth promotion of vertical graphene on SiO_2/Si by Ar plasma process in plasma-enhanced chemical vapor deposition

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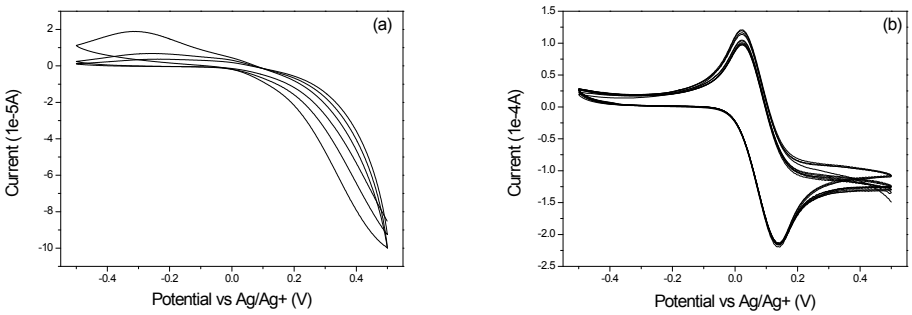

Figure S1. Electrochemical performance of VG nanosheets. Cyclic voltammetry within the voltage window of -0.5–0.5 V with TBAP (tetrabutylammonium perchlorate) acetonitrile solution as electrolyte. (a) bare conductive silicon (b) VG nanosheets on conductive silicon substrate for 20 cycles.

To test the electrochemical applicability, VG nanosheets was tested as working electrode and Pt mesh as counter electrode. Ferrocene was added as redox reagent. A typical electrochemical cyclic voltammetry is shown in Figure S1b. The CV curve is closed symmetry and a sharp symmetrical peaks indicating redox reaction, and the reaction is perfectly reversible.

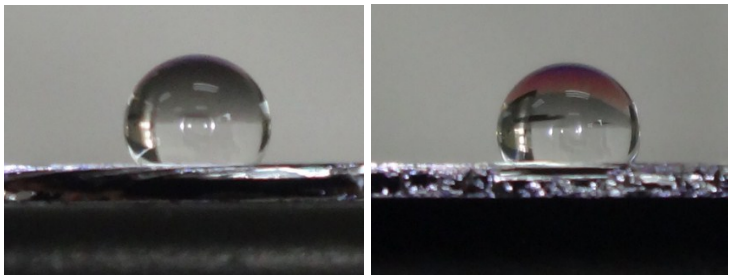

Figure S2. Contact angle measurement results for VG nanosheets on different test spots.

5 μL DI water was dropped by pipette onto the surface of the sample. Photo was taken from the vertical side of the sample by a micro camera. It is known that the commonly observed wettability of graphene in ambient conditions shows weak hydrophobicity due to airborne hydrocarbon adsorption (water contact angle (WCA) ~90°).[1,2] The VG nanosheets prepared in this work exhibit WCAs of ~135° indicating good hydrophobic performance.

References

(1) Z. Li, Y. Wang, A. Kozbial, G. Shenoy, F. Zhou, R. McGinley, P. Ireland, B. Morganstein, A. Kunkel, S. P. Surwade, L. Li and H. Liu, Nat. Mater., 2013, 12 (10), 925–931.

(2) C. A. Amadei, C.-Y. Lai, D. Heskes and M. J. Chiesa, Chem. Phys., 2014, 141 (8), 084709.