

Electronic supplementary information (ESI)

Chemical Vapor Deposition Derived Graphene Papers: High Capacity Flexible Anodes for Lithium Rechargeable Batteries

Guoqing Ning,*^a Chenggen Xu,^a Yanming Cao,^a Xiao Zhu,^a Zhimin Jiang,^b Zhuangjun Fan,^c Weizhong Qian,^d Fei Wei^d and Jinsen Gao*^a

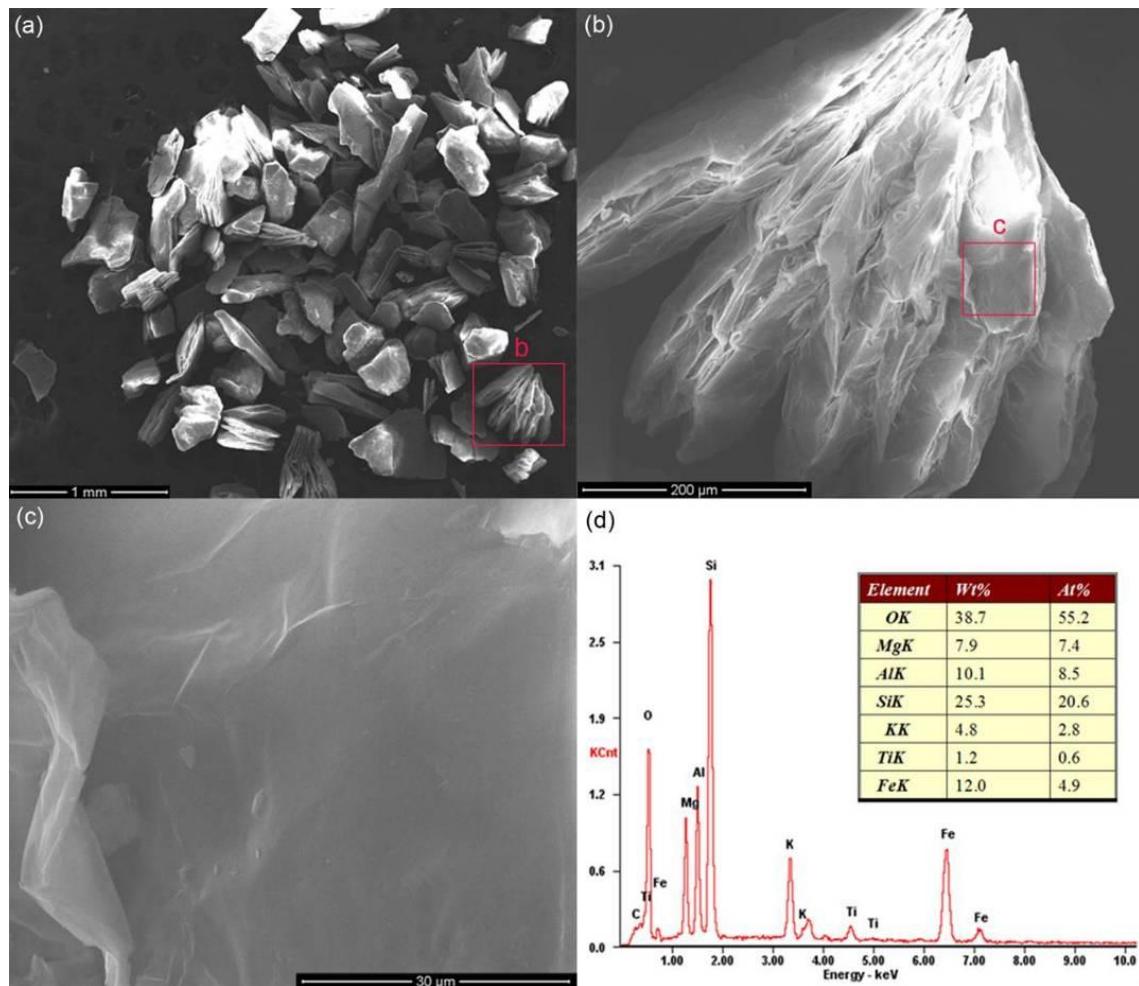


Fig. S1 (a-c) SEM images and (d) EDS element analysis of the expanded vermiculite.

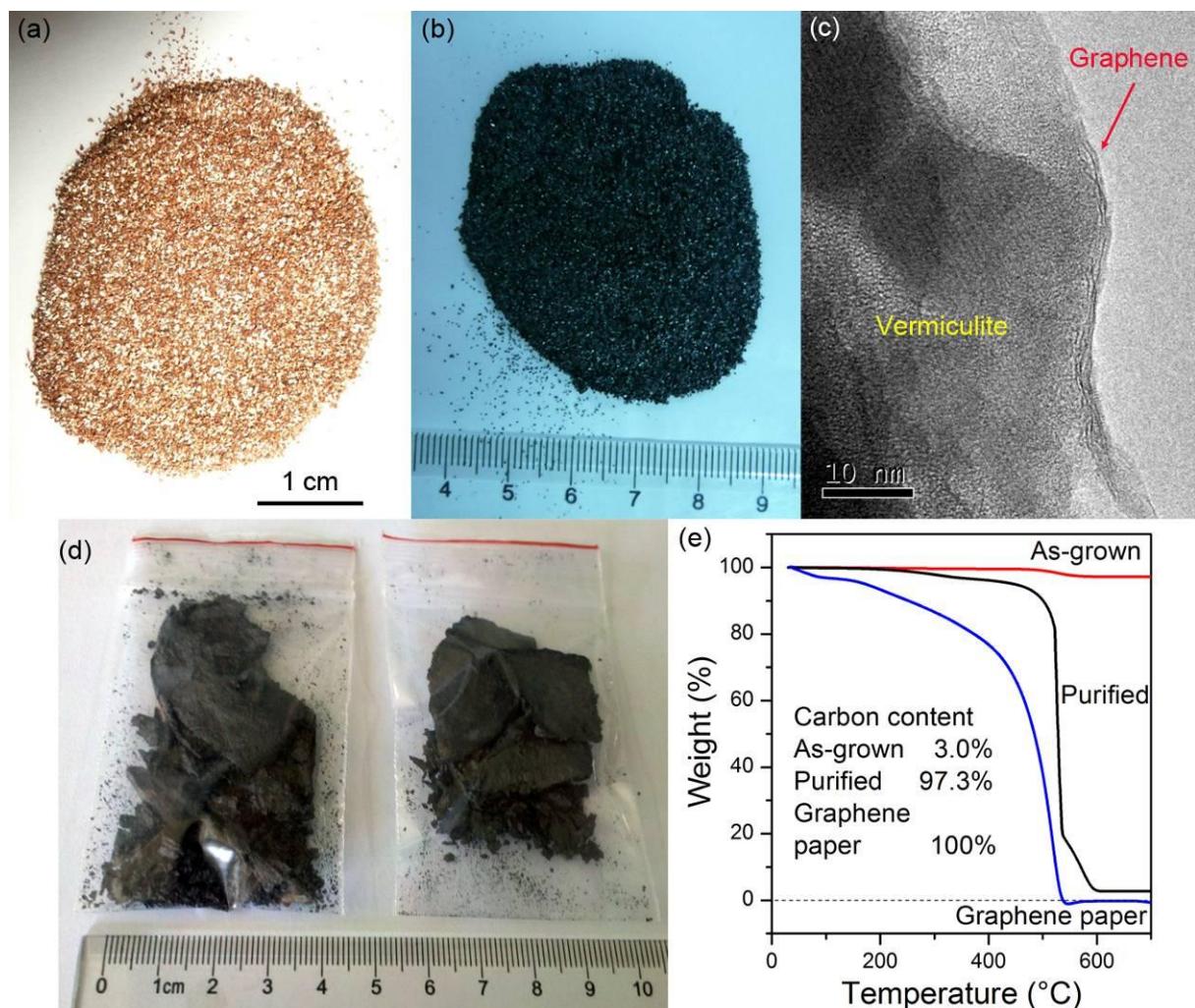


Fig. S2 Photos of (a) the expanded vermiculite, (b) the as-prepared material before acid washing and (d) the purified graphene bulk material. (c) TEM image of the as-prepared graphene showing graphene layers deposited on vermiculite. (e) TGA curves of the graphene materials prepared by C_2H_4 cracking on vermiculite templates.

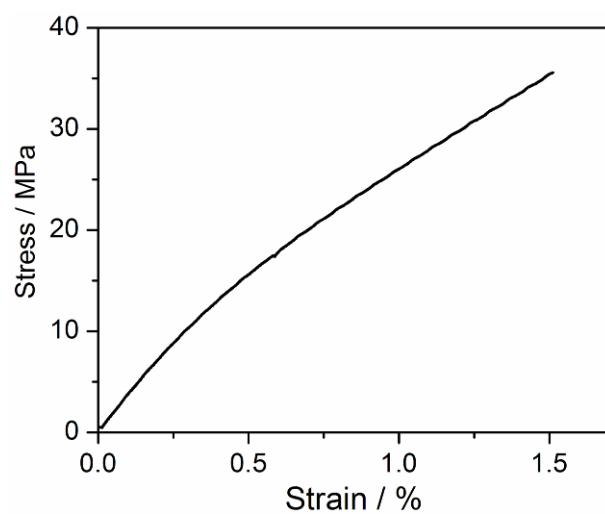


Fig. S3 Typical tensile curve of the CVD-graphene paper.

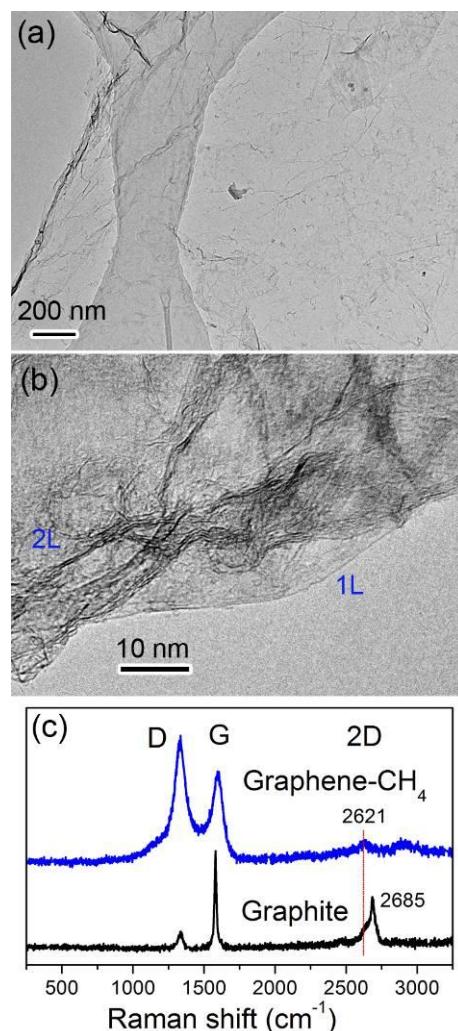


Fig. S4 (a, b) TEM images and (c) Raman spectrum (in comparison with graphite) of the graphene prepared with expanded vermiculite using CH₄ as carbon source. The 2D peak of the graphene (2621 cm⁻¹) is obviously downshifted as compared to that of graphite (2685 cm⁻¹), indicating that the graphene has only one to two graphene layers, well consistent with the TEM observation.

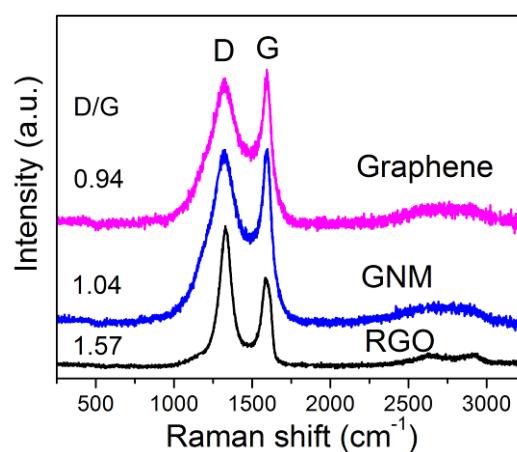


Fig. S5 Raman spectra of the graphene and the GNM (prepared using C₂H₄ as carbon source) in comparison with that of rGO.

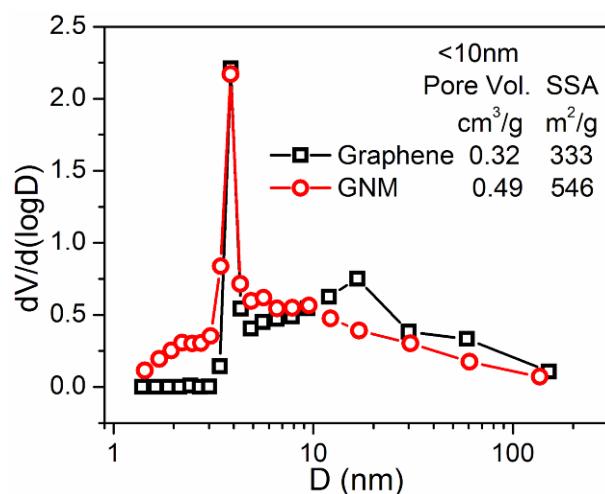


Fig. S6 Pore size distributions of the graphene and the GNM.

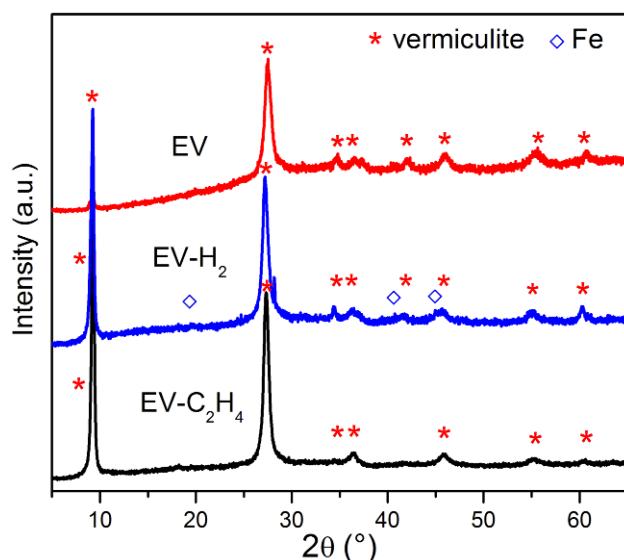


Fig. S7 XRD patterns of the untreated expanded vermiculite (EV), the H₂-reduced expanded vermiculite (EV-H₂) and the expanded vermiculite after carbon deposition (EV-C₂H₄).

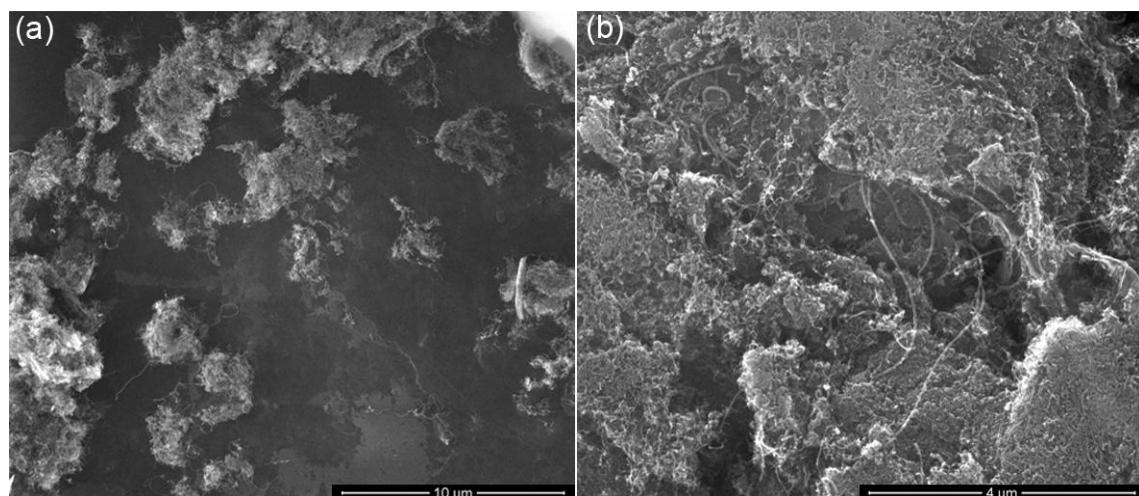


Fig. S8 SEM images of the materials prepared with a H₂ to C₂H₄ ratio of 1:2 before (a) and after purification (b).