Electronic Supplementary Information

Fluorinated Graphene: Facile Solution Preparation and Tailorable Properties by Fluorine-content Tuning

Fu-Gang Zhao, a, ‡ Gang Zhao, b, ‡ Xin-Hua Liu, c Cong-Wu Ge, a Jin-Tu Wang, a Bai-Li Li, a Qi-Gang Wang, * c Wei-Shi Li, * a and Qing-Yun Chen * b

a Laboratory of Synthetic and Self-Assembly Chemistry for Organic Functional Molecules, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 345 Lingling Road, Shanghai 200032, China. E-mail: liws@mail.sioc.ac.cn.

b Key Laboratory of Organofluorine Chemistry, Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences, 345 Lingling Road, Shanghai 200032, China. E-mail: chenyq@mail.sioc.ac.cn.

c Department of Chemistry, Tongji University, 1239 Siping Road, Shanghai 200092, China. E-mail: wangqg66@tongji.edu.cn.

‡ These authors contributed equally to this work.
Fig. S1  (a) Survey XPS spectra of as-prepared GO and fluorinated graphene products. C1s XPS spectra of (b) GO and (c) fluorinated graphene products. Insets: F1s XPS spectra of fluorinated graphene products.
Fig. S2  Raman spectra and corresponding I_D/I_G ratio of GO and fluorinated graphene products.
Fig. S3  FE-SEM images of freeze-dried (a) FGNone, (b) FGDCM, (c) FGPy, (d) FGTHF, (e) FGDCE, and (f) FGDCB powders. Scale bar: 2 μm.
Fig. S4  TEM images and SAED patterns of (a) FG$_{\text{None}}$, (b) FG$_{\text{DCM}}$, (c) FG$_{\text{Py}}$, (d) FG$_{\text{THF}}$, (e) FG$_{\text{DCE}}$, and (f) FG$_{\text{DCB}}$. Scale bar: 200 nm
Fig. S5  AFM images and corresponding height profiles of (a) GO, (b) FGNone, (c) FGDCM, (d) FGPys, (e) FGTHF, (f) FGDCE, and (g) FGDCB.
**Fig. S6** UV-vis absorption spectra of GO in CH$_3$CN solution with a concentration of $2.5 \times 10^{-3}$ mg mL$^{-1}$. The calculated bandgap of GO is about 3.46 eV, according to empirical formula of $1240/\lambda_{\text{Abs, onset}}$.

**Fig. S7** Dispersity of FG$_{DCB}$ in a variety of solvents with a concentration of 1 mg mL$^{-1}$ at room temperature. (a) as-ultrasonicated; (b) left undisturbed for 3 days.
Fig. S8  Nitrogen adsorption and desorption isotherms of (a) FGDCM and (b) FGTHF