Supplementary Information

Preparation and liquid-phase exfoliation of graphite fluoroxide towards graphene fluoroxide

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The purpose of this work is to prepare GFO with high yield and quality. High yield can be obtained via optimizing the ultrasonic conditions, e.g. prolonging the ultrasonic time. At a given ultrasonic power, concentration of GFO dispersed in NMP increases rapidly in the first 30 minutes, as shown in Fig.S1, then increases slowly with the ultrasonic time. However, similar to other reports, excessive ultrasonic time will lead to more energy consumption and the crush of GFO sheets, which was proved by AFM and TEM results.[1,2] Getting into fragmentation is adverse for GFO to maintain its outstanding properties, such as mechanical strength.[3] Therefore, an appropriate ultrasonic time is crucial to get high quality and yield GFO sheets. In our study, when the ultrasonic time is more than one hour, no significant difference was observed on the concentrations of GFO in NMP and other solvents. Hence, we chose one hour ultrasonication to obtain the best exfoliation effect.

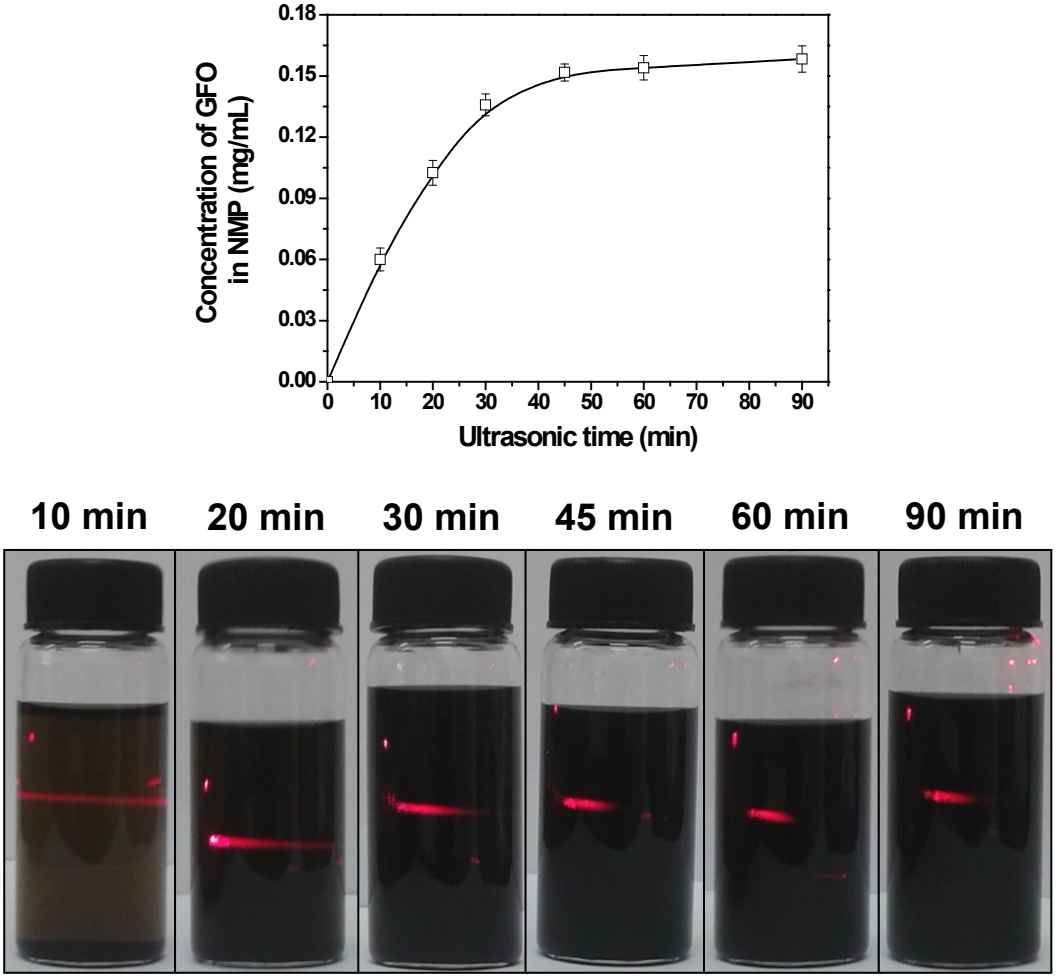

Fig. S1 Influence of ultrasonic time on the concentration of GFO in NMP.

References

1 F. Kokai, R. Sorin, H. Chigusa, K. Hanai, A. Koshio, M. Ishihara, Y. Koga, M. Hasegawa, N. Imanishi and Y. Takeda, *Diamond & Related Materials*, 2012, **29**, 63.
2 S. Łoś, L. Duclaux, L. Alvarez, Ł. Hawełek, S. Duber and W. Kempiński, *Carbon*, 2013, **55**, 53.
3 G.Q. Qi, J. Cao, R.Y. Bao, Z.Y. Liu, W. Yang, B. H. Xie and M. B. Yang, *J. Mater. Chem. A*, 2013, **1**, 3163.