Electronic Supplementary Information (ESI) for

Noncolvalent Functionalization of Graphene with End-Functional Polymers

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Characterization of graphene oxide and reduced graphene – FTIR spectra

Figure S1 shows FTIR spectra of graphite, graphene oxide and reduced graphene. While no significant peak was found in graphite, the presence of different type of oxygen functionalities in graphene oxide was confirmed at 3400 cm^{-1} (O−H stretching vibrations), at 1720 cm^{-1} (stretching vibrations from C=O), at 1600 cm^{-1} (skeletal vibrations from unoxidized graphitic domains), at 1220 cm^{-1} (C−OH stretching vibrations), and at 1060 cm^{-1} (C−O stretching vibrations) [Xu, Y. et al, *J. Am. Chem. Soc*. 2008, 130, 5856]. FTIR peak of reduced graphene presents that O−H stretching vibrations observed at 3400 cm^{-1} was significantly reduced due to deoxygenation. However, stretching vibrations from C=O at 1720 cm^{-1} were still observed and C−O stretching vibrations at 1060 cm^{-1} became sharper, which were caused by remaineing carboxyl groups even after hydrazine reduction [Li, D. et al., *Nature Nanotechnol*. 2008, 3, 101].

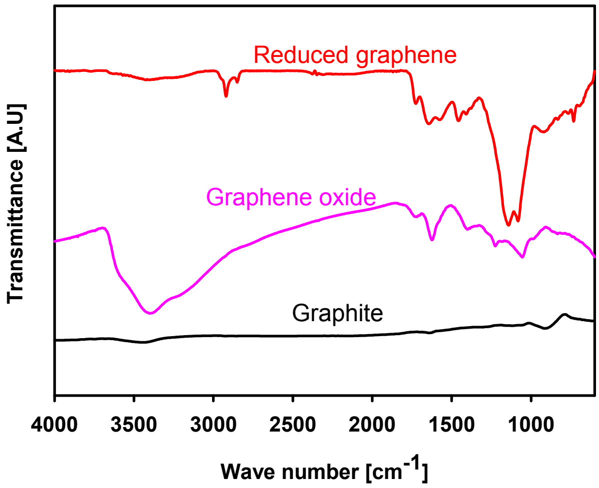

Figure S1. FTIR spectra of graphite, graphene oxide and reduced graphene.

Characterization of graphene oxide and reduced graphene – UV-Vis spectroscopy

As shown in Figure S2, the absorption peak at 230 nm red-shifted to 270 nm, indicating that the electronic conjugation within the reduced graphene sheets was revived upon reduction of graphene oxide [Li, D. et al., *Nature Nanotechnol.* 2008, 3, 101].

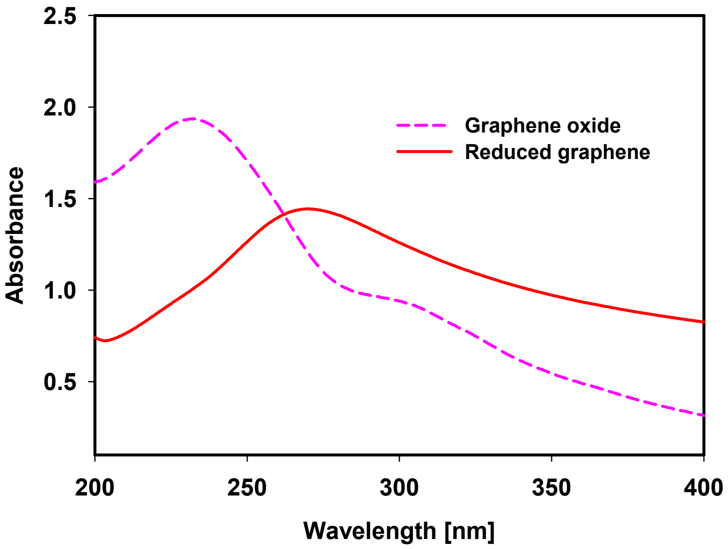

Figure S2. UV-Vis absorption spectra of graphene oxide (0.03 mg/ml) and reduced graphene (0.01 mg/ml).

Characterization of graphene oxide and reduced graphene – Thermogravimetric analysis (TGA)

Thermogravimetric analysis (TGA) of graphite, graphene oxide and reduced graphene was carried out under N_2 flow using TA Instrument Thermogravimetric Analyzer Q50 (USA) and their masses were recorded as a function of temperature. The samples were heated from room temperature to 600 °C at 5 °C/min. The results are shown in Figure S3. As expected, graphite was highly stable up to 600 °C. Graphene oxide shows slight mass decrease from room temperature to 150 °C and significant decrease from 150 °C to 200 °C. The mass of graphene oxide slowly further decreased up to 600 °C. The major mass reduction at ~ 200 °C was caused by pyrolysis of the oxygen-containing functional groups, generating CO, CO_2 and stream [Lerf, A. et al. J. *Phys. Chem. B*. 1998, 102, 4477]. On the other hand, reduced graphene showed an enhanced thermal stability due to the removal of oxygen-containing functional groups by hydrazine reduction [Stankovich, S. et al. *Carbon*, 2007, 45, 1558].

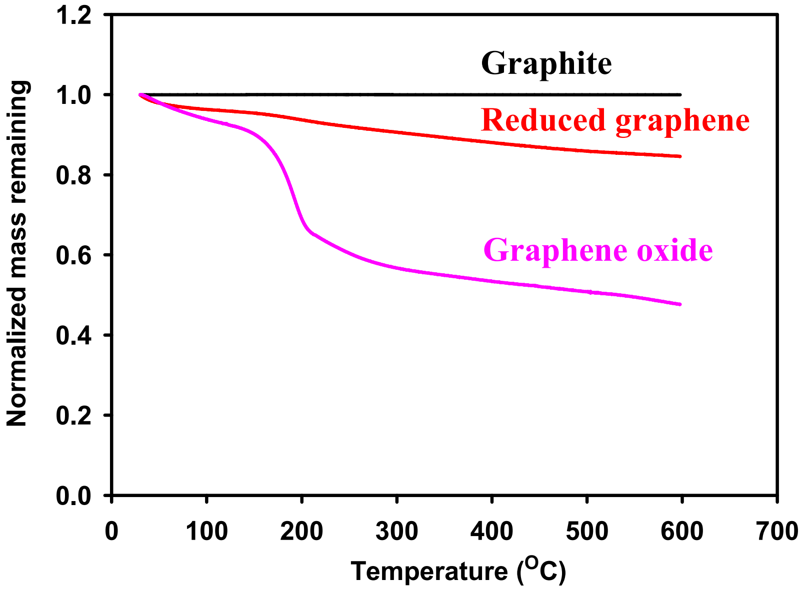

Figure S3. Normalized TGA plots for graphite, graphene oxide and reduced graphene.