

Synthesis of amine functionalized graphite nanosheets and its water-soluble derivative for drug loading and controlled release

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15 Electronic Supplementary information (ESI)

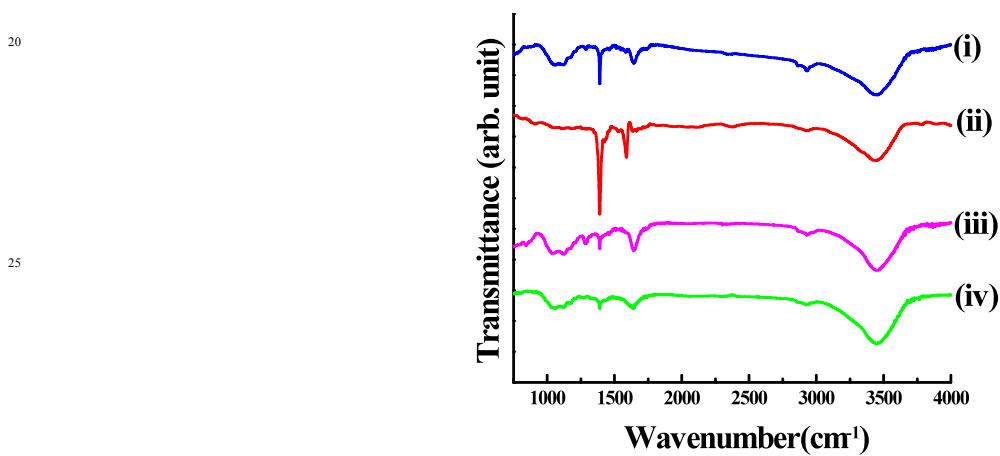
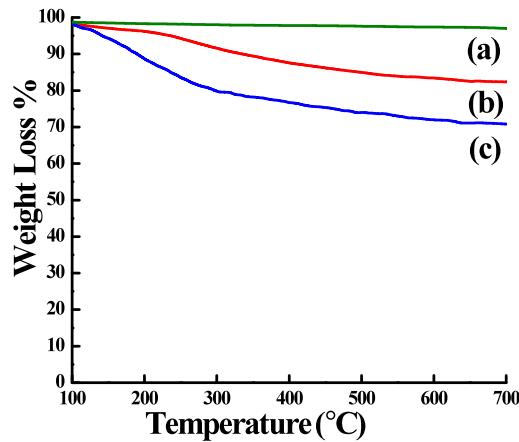


Fig. S1 FTIR spectra after treatment of microcrystalline graphite with (i) 2:1, (ii) 1:1, (iii) 1:2 and (iv) 1:3 v/v ratio of HNO₃ and H₂SO₄ at room temperature for 24 hrs.



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Fig. S2 TGA spectra of (a) microcrystalline graphite (b) AFGNS and (c) NFGNS.

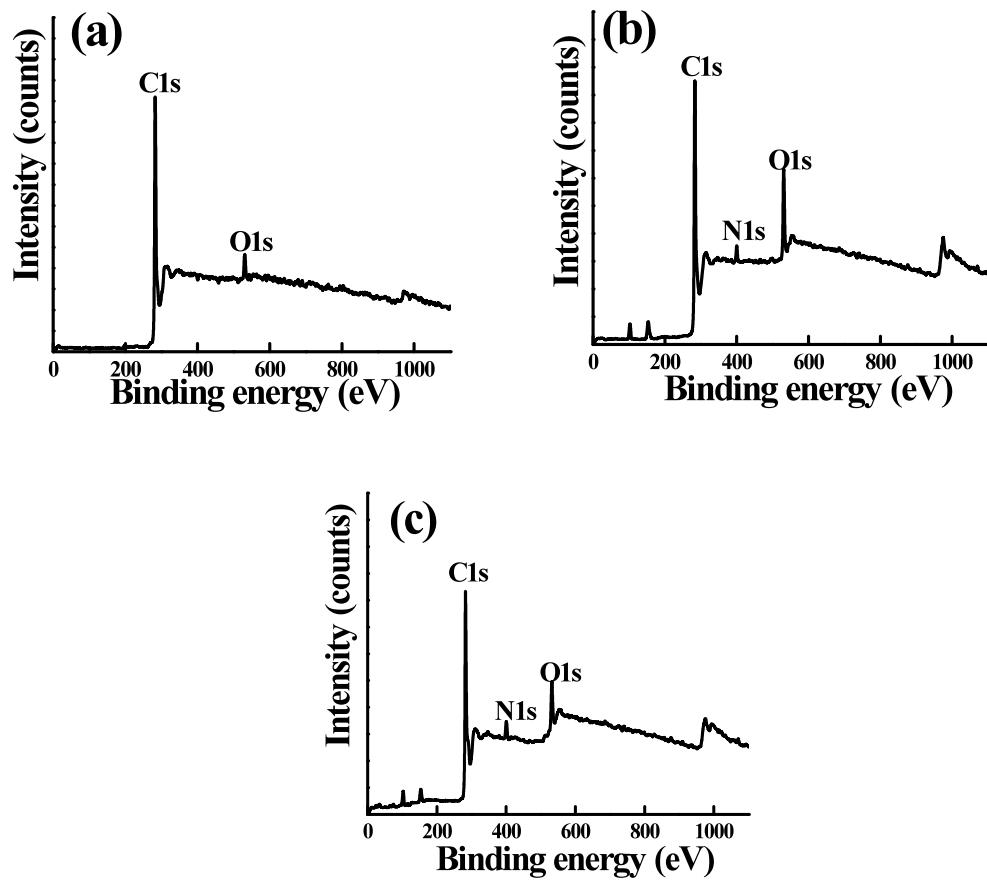
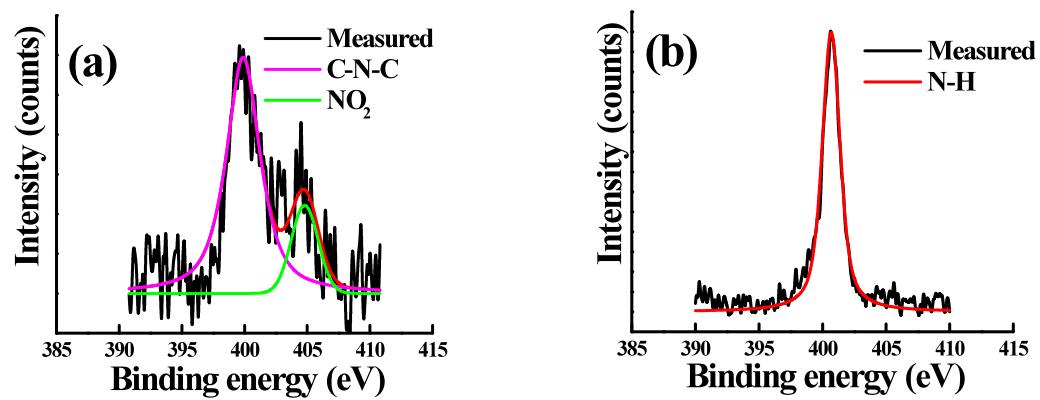
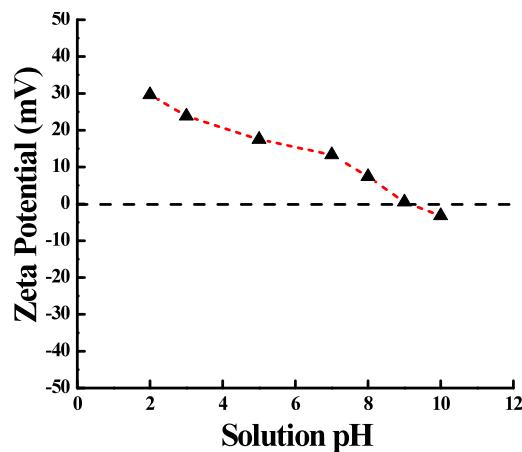


Fig. S3 XPS survey scan of (a) microcrystalline graphite, (b) NFGNS and (c) AFGNS.



20 **Fig. S4** High resolution N 1s XPS of (a) NFGNS and (b) AFGNS



35 **Fig. S5** Zeta Potential of AFGNS dispersion as the function of pH.

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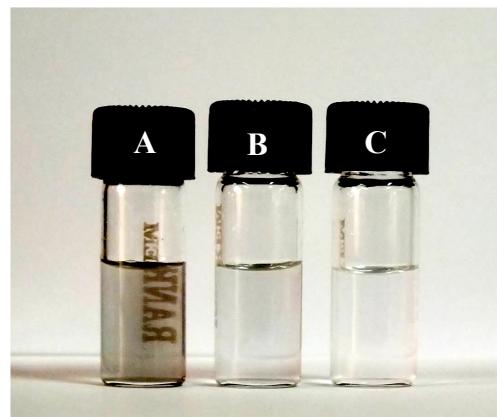
Fig. S6 Digital photograph of the aqueous dispersion of AFGNS (2 mg AFGNS powder in 10 ml water, 30 min ultrasonication).

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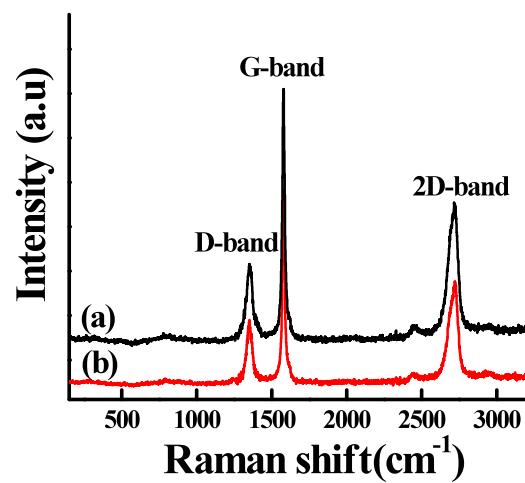
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Fig. S7 Digital photograph of the centrifugates: A) P-AFGNS, B) AFGNS and C) microcrystalline graphite. In all the cases, an aqueous dispersion of 2 mg powder in 10 ml water was centrifuged at 3000 rpm for 15 min.

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Fig. S8 Raman spectra of (a) P-AFGNS and (b) AFGNS.

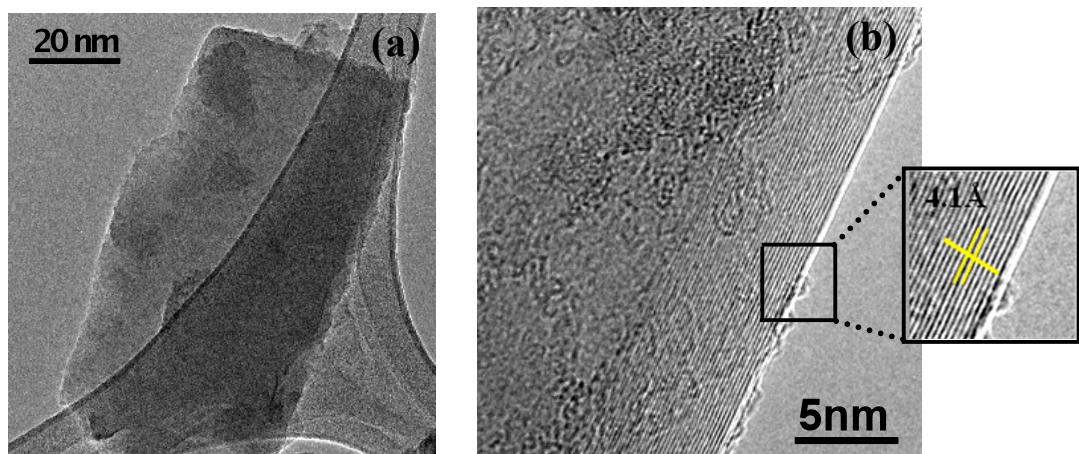


Fig. S9 (a) TEM image and (b) HRTEM image of P-AFGNS with visible rough surface due to the attachment of the polymer PEG on AFGNS surface. Magnified image shows interlayer spacing.

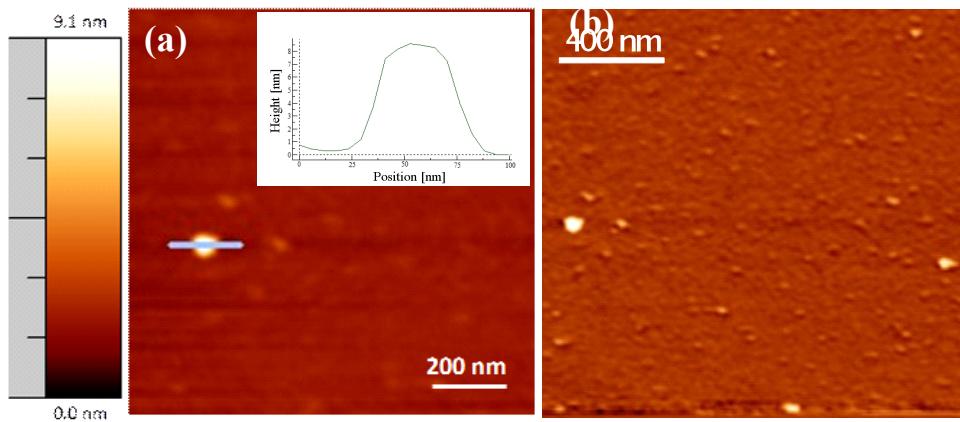


Fig. S10 AFM (a) height image of P-AFGNS with the height profile of the marked region in inset, (b) phase image of AFGNS.

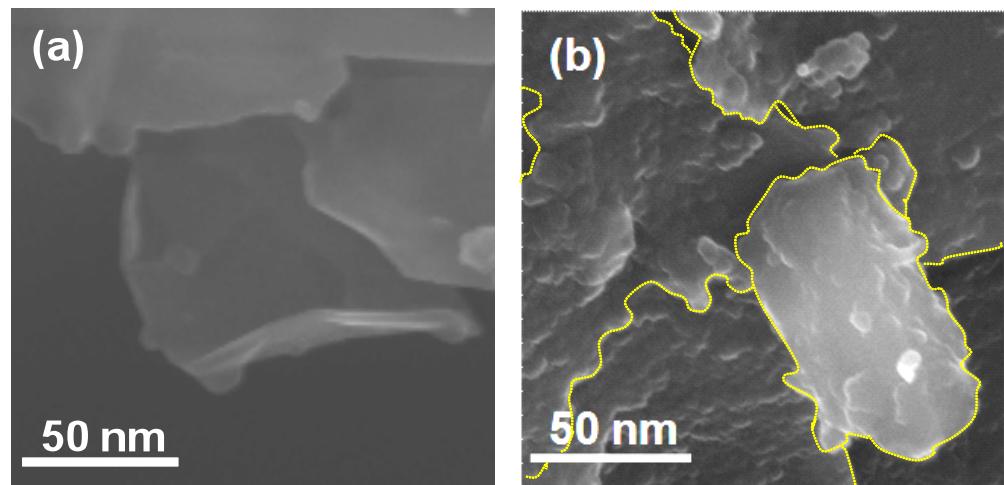
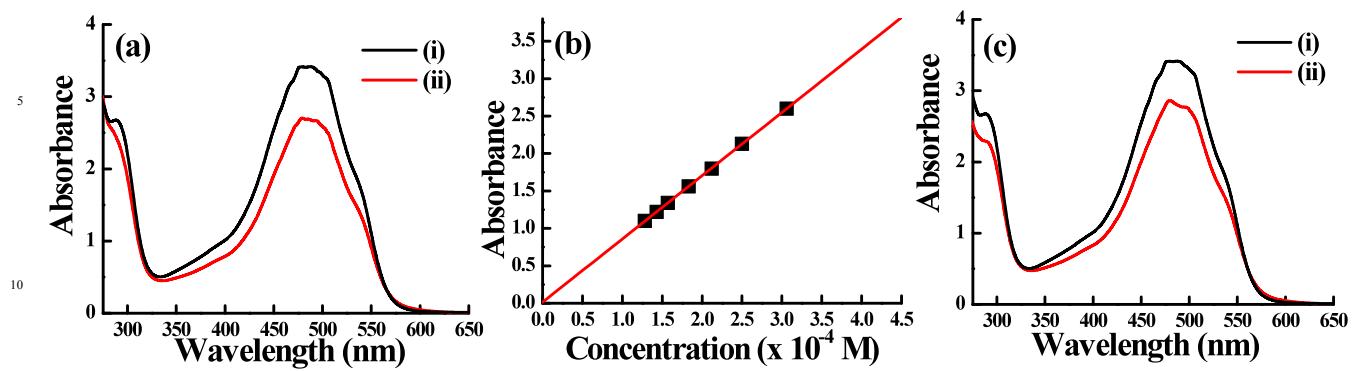


Fig. S11 FESEM micrographs of (a) AFGNS and (b) P-AFGNS composite.



15 **Fig. S12** (a) UV-Vis spectra of AFGNS-DOX where (i) initial DOX dosage and (ii) unbound DOX dosage found in the centrifugate (b) calibration graph of DOX at different concentrations and (c) UV-Vis spectra of P-AFGNS-DOX where (i) initial DOX dosage and (ii) unbound DOX dosage found in the centrifugate. The loading capacity was calculated to be 34.9% in AFGNS and 29.6% in P-AFGNS.