

Supporting information

Dispersible composites of exfoliated graphite and polyaniline with improved electrochemical behaviour for solid-state chemical sensor applications

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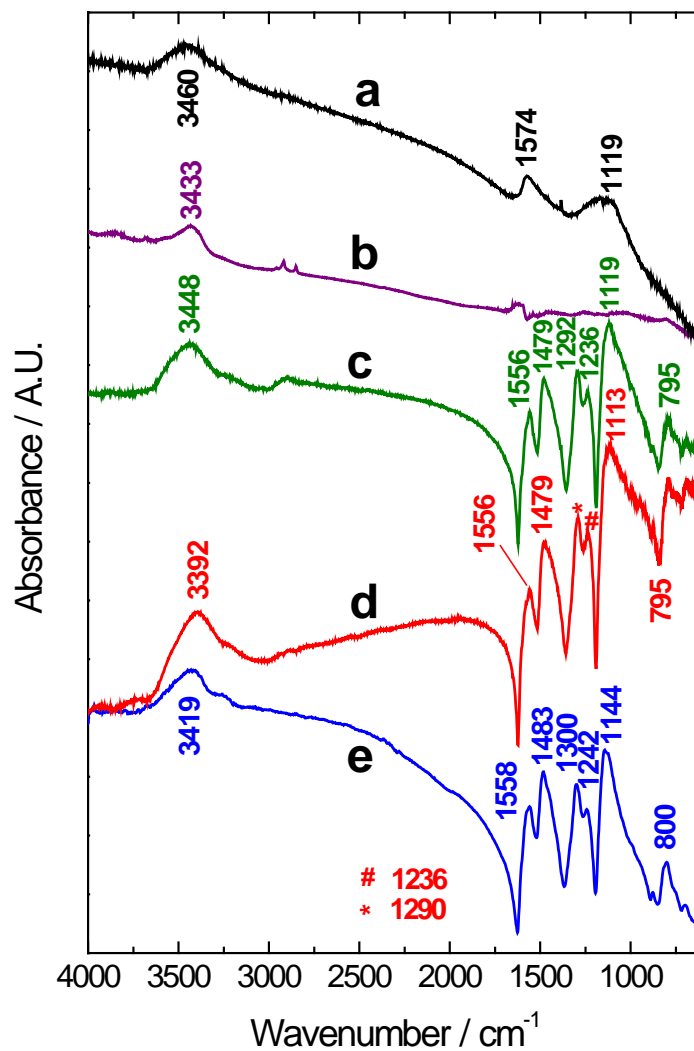


Fig. S1. The FTIR-spectra of (a) graphene (< 3 monolayers), (b) exfoliated graphite (30-50 monolayers) (c) neat PANI(ES), (d) PANI(ES)-graphene and (e) PANI(ES)-graphite.

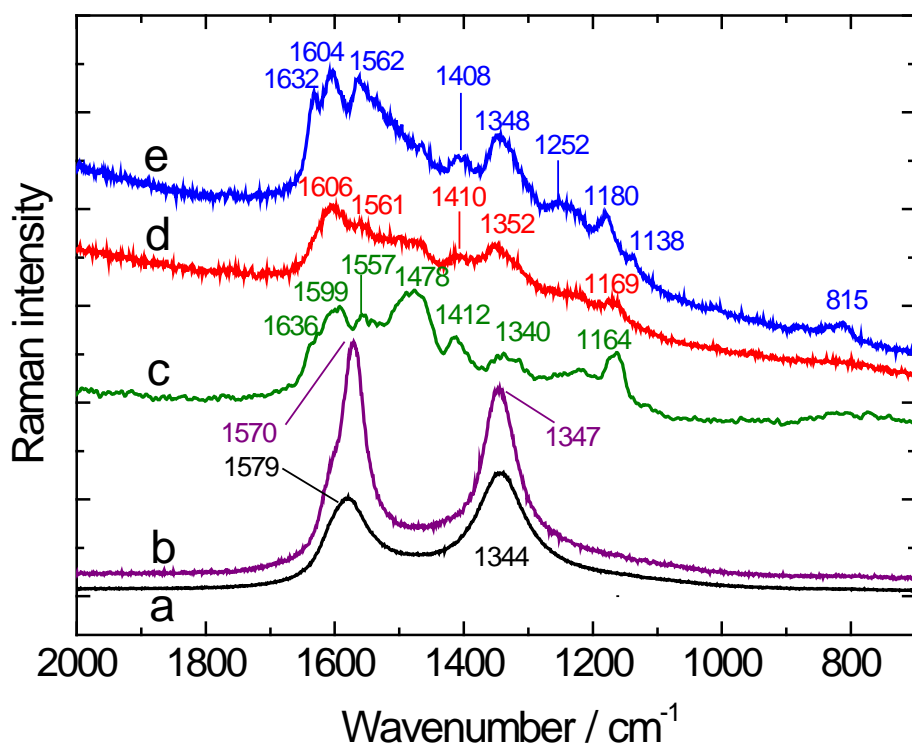


Fig. S2. Raman spectra of (a) graphene (< 3 monolayers), (b) exfoliated graphite (30-50 monolayers), (c) neat PANI(EB) and (d) PANI(EB)-graphene and (e) the PANI(EB)-graphite composites; λ_{exc} : 514 nm.

Table S1. Assignments and wavenumbers of the main Raman bands of graphene, graphite, PANI(EB), PANI(EB)-graphene and PANI(EB)-graphite. The benzoid, quinoid and semiquinone radical units are denoted by B, Q and SQR, respectively.

<i>Graphene</i>	<i>Graphite</i>	<i>PANI(EB)</i>	<i>PANI(EB)- graphene</i>	<i>PANI(EB)- graphite</i>	<i>Assignments</i>	<i>Ref.</i>
(cm ⁻¹)	(cm ⁻¹)	(cm ⁻¹)	(cm ⁻¹)	(cm ⁻¹)		
-	-	-	-	815	Ring symmetric stretching; amine deformation	3
-	-	-	-	1138	C-H in-plane bending (Q)	1, 3
-	-	1164	1169	1180	C-H in-plane bending (B)	1, 3
-	-	-	-	1252	C-N ⁺ stretching (SQR)	1-3
1344	1347	-	-	-	D-band (defect zones)	4
-	-	1340	1352	1348	C-N ⁺ stretching (SQR)	1, 5
-	-	1412	1410	1408	C-C stretching (Q)	3
-	-	1478	1473	-	C=N and CH=CH stretching (Q)	1-3, 6
-	-	1557	1561	1562	C-C stretching	3, 6
1579	1570	-	-	-	G-band (doubly degenerate zone centre E_{2g} mode)	4
-	-	1599	1606	1604	C=C stretching (Q)	1,3
-	-	1636	-	1632	C-C stretching (B)	1-3

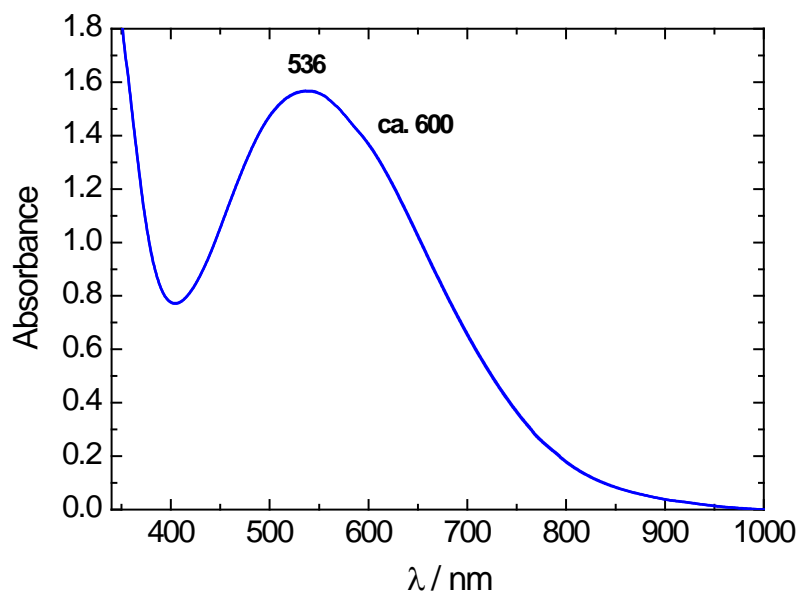


Fig. S3. UV-vis spectra of the PANI-graphite film measured at equilibrium at pH=7.8 and 9.5. The two spectra are overlapping. The composite film was casted onto the tin oxide glass substrate which was coated with a 10 nm thick Pt layer. The pH of the supporting electrolyte (0.1 M NaCl) was adjusting with NaOH either to pH=7.8 or 9.5 and measured with a pH electrode before and after the UV-vis measurement (ca. 1 min).

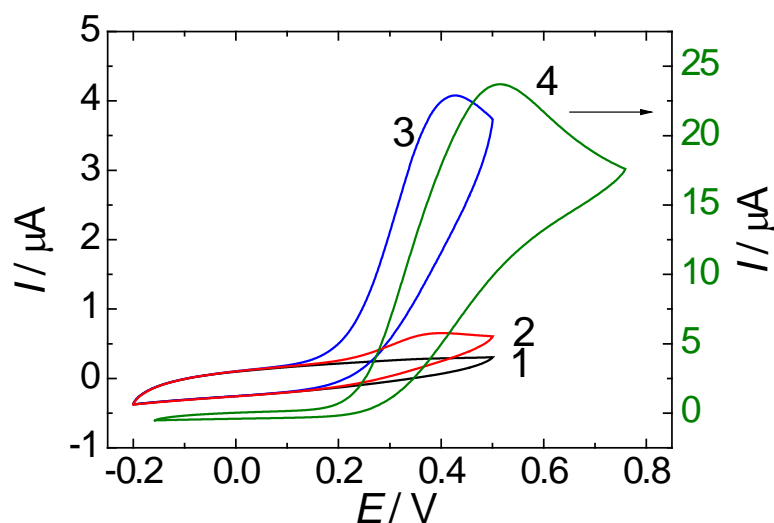


Fig. S4. Cyclic voltammograms of (1) 10^{-5} M, (2) 10^{-4} M, (3) 10^{-3} M and (4) 10^{-2} M ascorbic acid measured with glassy carbon as the working electrode; Reference electrode: Ag/AgCl/3 M KCl, $v=50 \text{ mV s}^{-1}$.

References

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