Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B

Supplied Materials

Large–area, three–dimensional interconnected graphene oxide intercalated with self–doped polyaniline nanofibers as a free–standing electrocatalytic platform for adenine and guanine

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1. XPS characterization of GNO-SPAN

The C 1s XPS spectrum of GNO-SPAN shown in Figure S1A clearly indicated a certain extent of oxidation of graphite upon chemical exfoliation. The three prominent peaks (284.5, 285.3, 287.0 eV) observed on GNO-SPAN present the existence of a certain amount of functional groups on the surface[1,2]. From N 1s XPS spectrum (Figure S1B), the benzenoid amine with binding energy (BE) centered at 399.5 eV and the nitrogen cationic radical (N + ·) with BE at 401.9 eV are clearly identified[3]. As shown in Fig. S1C (S 2p XPS spectrum), the S 2p peaks appeared at 167.4 eV and 168.4 eV are consistent with the existence of $-SO_3^-$ groups in the GNO-SPAN, which is further confirmed by O 1s XPS spectrum (Fig. S1D, 532.7 eV) [4]. In addition, the peak at 531.1 eV in O 1s XPS spectrum is corresponding to C-O entity[5].

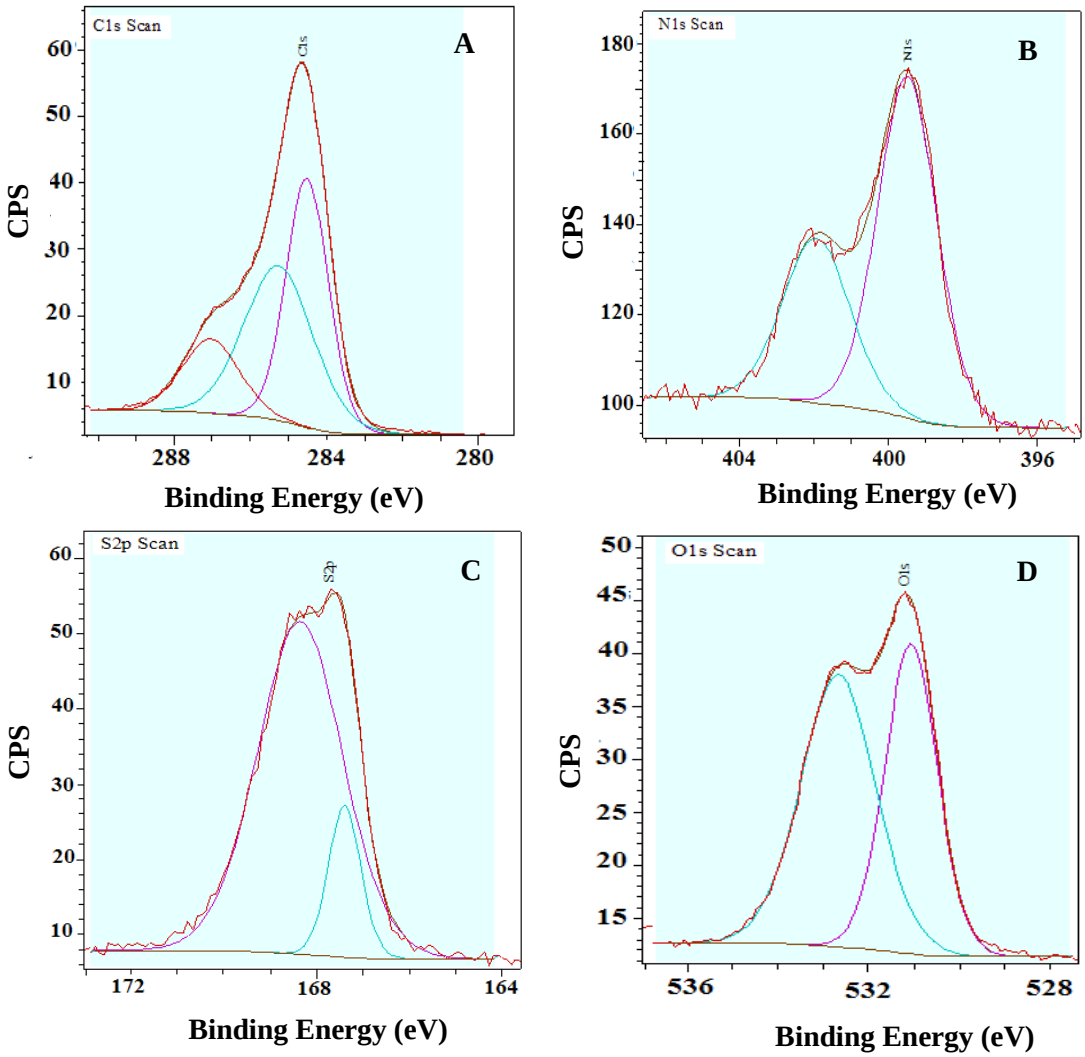

Fig. S1 The C 1s(A), N 1s(B), O 1s (C) and S 2p (D) XPS spectrum of GNO-SPAN. *Note*: count per second (CPS)

1 Y. Wang, S. Zhang, D. Du, Y. Y. Shao, Z. H. Li, J. Wang, M. H. Engelhard, J. H. Li and Y. H. Lin, *J. Mater. Chem.*, 2011, **21**, 5319.

2 C. Z. Zhu, S. J. Guo, Y. X. Fang, L. Han, E. K. Wang and S. J. Dong, *Nano Res.*, 2011, **4**, 648.

3 X. M. Feng, R. M. Li, Y. W. Ma, R. F. Chen, N. E. Shi, Q. L. Fan and W. Huang, *Adv. Funct. Mater.*, 2011, **21**, 2989.

4 S. G. Wu, T. L. Wang, Z. Y. Gao, H. H. Xu, B. N. Zhou and C. Q. Wang, *Biosens. Bioelectron.*, 2008, **23**,1776.

5 S. S. Gupta, T. S. Sreeprasad, S. M. Maliyekkal, S. K. Das and T. Pradeep, *ACS Appl. Mater. Interfaces*, 2012, **4**, 4156.

2. Optimization of determination conditions

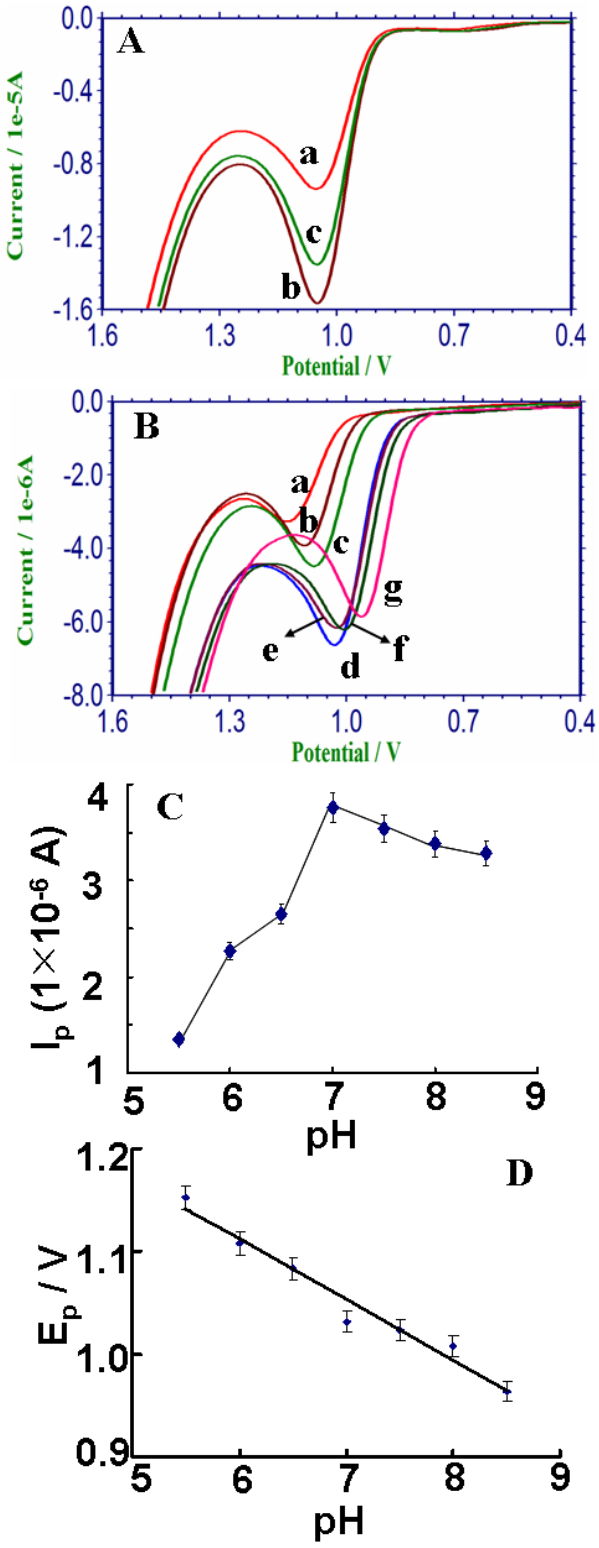

Fig. S2 (A) Representative DPV of 2×10^{-4} mol/L adenine in ABS (a), B–R (b) and PBS (c) buffer solutions. (B), (C), (D) The effect of pH on the electrooxidation of 5.0×10^{-5} mol/L adenine. (a)–(g) 5.5, 6.0, 6.5, 7.0, 7.5, 8.0 and 8.5. *Note*: Each point is the mean of three measurements, and the error bars correspond to the standard deviation.

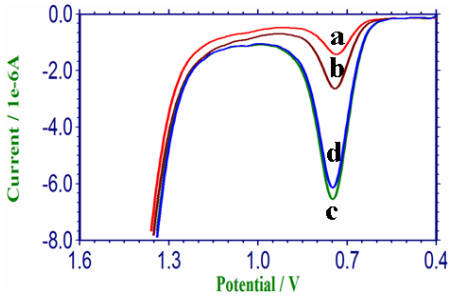

Fig. S3 Representative DPV in B–R solution with 2×10^{-4} mol/L guanine recorded at GNO–SPAN with different ultrasonic time s (a) 10 min, (b) 20 min, (c) 30 min, (d) 40 min.

3. Determinations of guanine and adenine

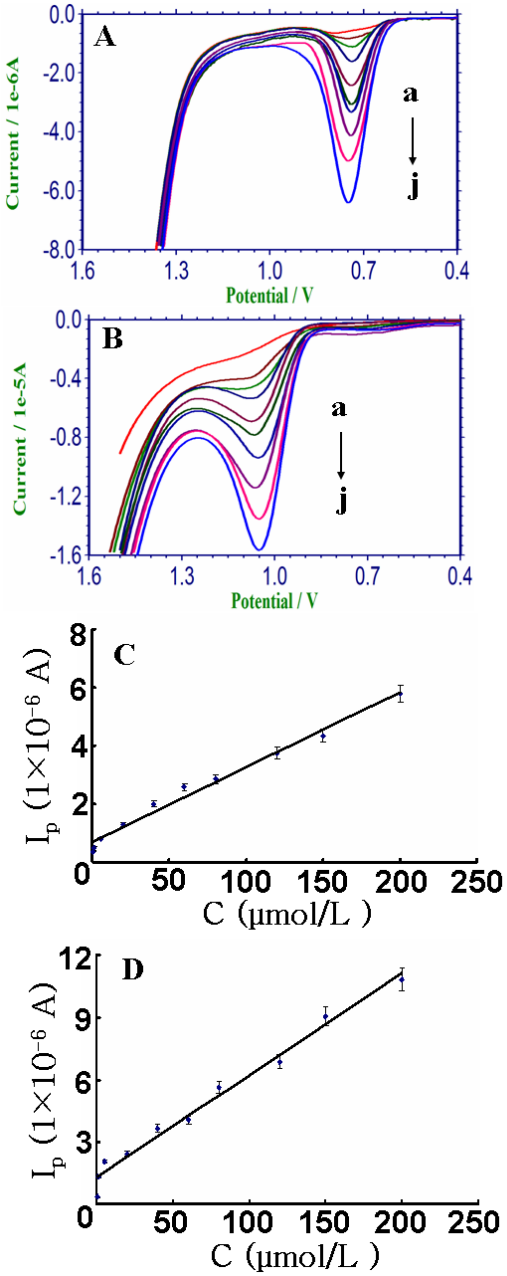

Fig. S4 Representative DPV of guanine (A) and adenine (B) (from a to j: 0.5, 1, 5, 20, 40, 60, 80, 120, 150 and 200 μmol/L) at GNO–SPAN/CPE in B–R. Calibration curves of the oxidation peakcurrent versus different concentration of guanine (C) and adenine (D), respectively. *Note*: Each point is the mean of three measurements, and the error bars correspond to the standard deviation.

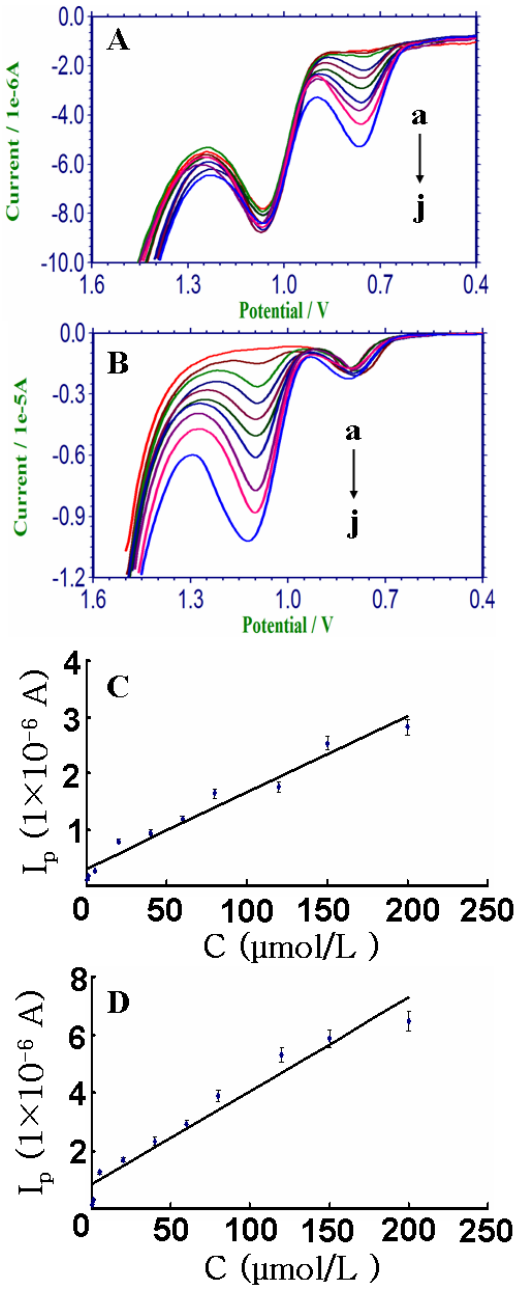

Fig. S5 (A) Representative DPV of guanine (from a to j: 0.5, 1, 5, 20, 40, 60, 80, 120, 150 and 200 μmol/L) in B–R (pH 7.0) with coexistence of 5.0×10^{-5} mol/L adenine at GNO–SPAN/CPE. (B) Representative DPV of adenine (from a to j: 0.5, 1, 5, 20, 40, 60, 80, 120, 150 and 200 μmol/L) in B–R (pH 7.0) with coexistence of 5.0×10^{-5} mol/L guanine at GNO–SPAN/CPE. (C) Calibration curve of guanine. (D) Calibration curve of adenine. *Note*: Each point is the mean of three measurements, and the error bars correspond to the standard deviation.