Electronic Supplementary Material (ESI) for Catalysis Science & Technology

Electronic Supplementary Information

Ag nanoparticles decorated polyaniline nanofibers: synthesis, characterization, and applications toward catalytic reduction of 4-nitrophenol and electrochemical detection of H_2O_2 and glucose

Guohui Chang[a], Yonglan Luo[a], Wenbo Lu[a], Xiaoyun Qin[a], Abdullah M. Asiri[b,c], Abdulrahman O. Al-Youbi[b,c] and Xuping Sun[a,b,c]*

[a]State Key Lab of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022 Jilin, China.

[b]Chemistry Department, Faculty of Science, King Abdulaziz University, Jeddah 21589, Saudi Arabia

[c]Center of Excellence for Advanced Materials Research, King Abdulaziz University, Jeddah 21589, Saudi Arabia

*To whom correspondence should be addressed. E-mail: sunxp@ciac.jl.cn. Fax: (+86) 431-85262065; Tel: (+86) 431-85262065

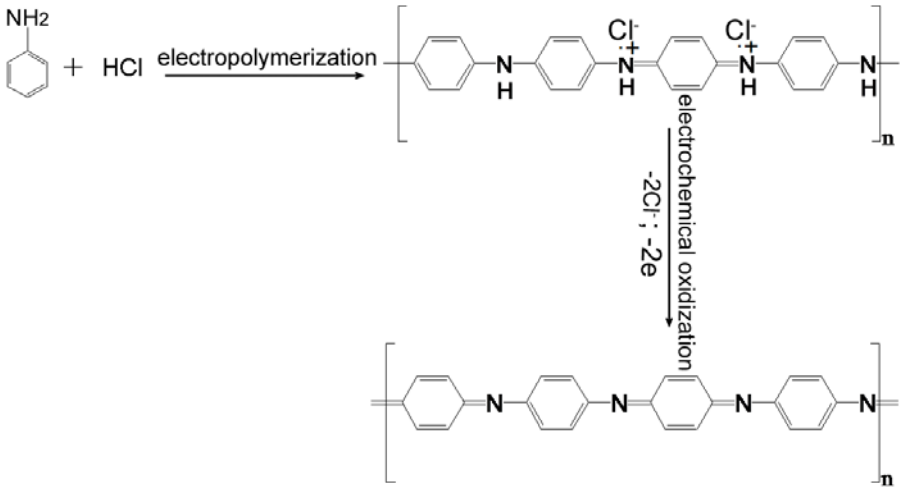

Fig. S1 A schematic illustrating the chemical structure and electropolymerization process of PANI.

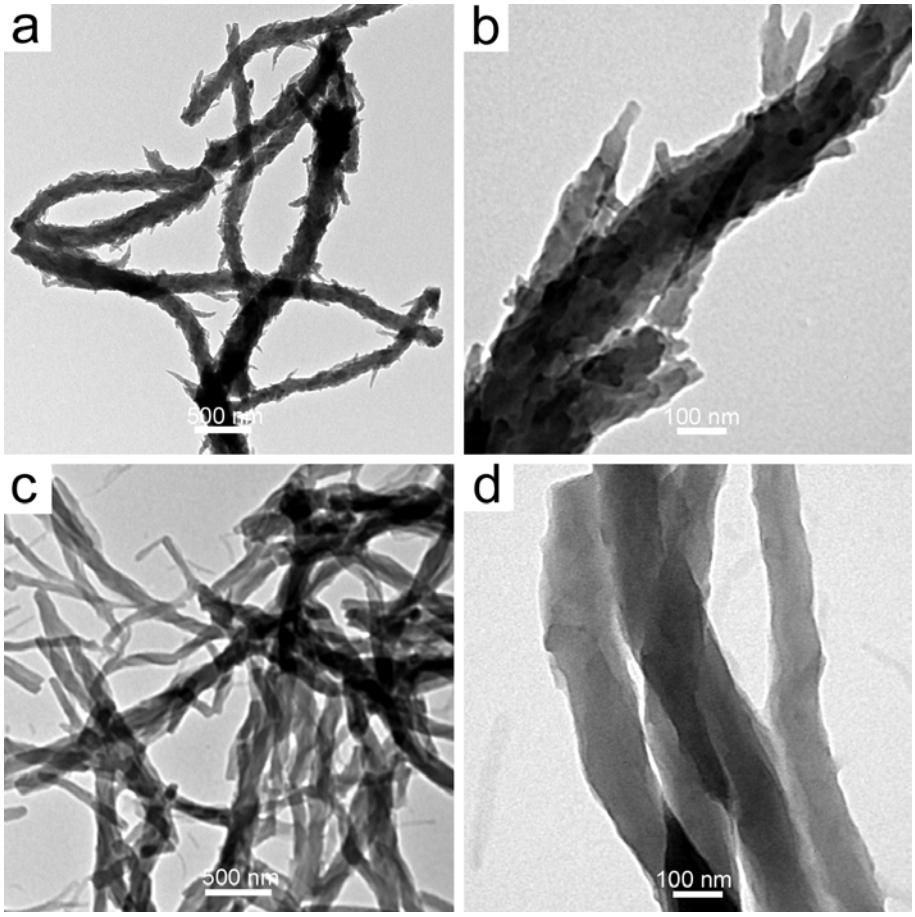

Fig. S2 Low magnification TEM images of PANINFs formed in a solution containing 0.1 M aniline and 1 M HCl at an applied potential of (a) 1.0 V and (c) 1.5 V. The corresponding high magnification TEM images are shown in (b) and (d), respectively.

Fig. S3 Photographs of AgNPs/PANINFs dispersed in (a) water and (b) acetone.

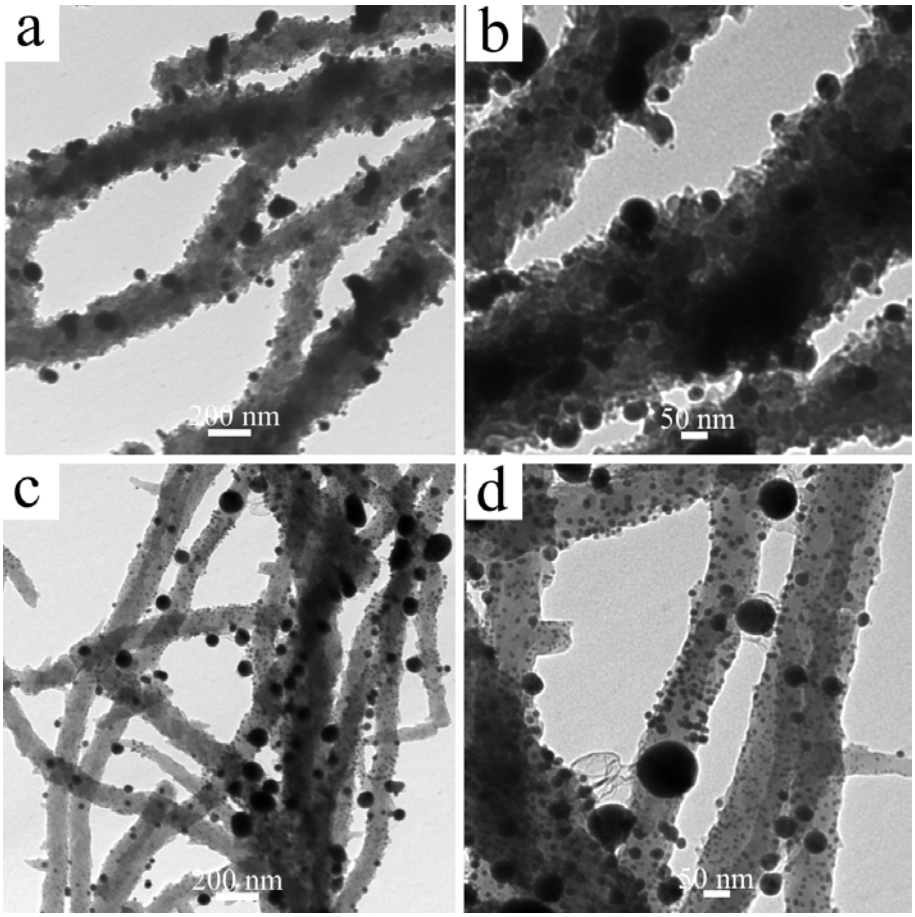

Fig. S4 Low magnification TEM images of AgNPs/PANINFs composites obtained by increasing the amount of Ag^{+} up to (a) 4-fold and (c) 8-fold. The corresponding high magnification TEM images are shown in (b) and (d), respectively.

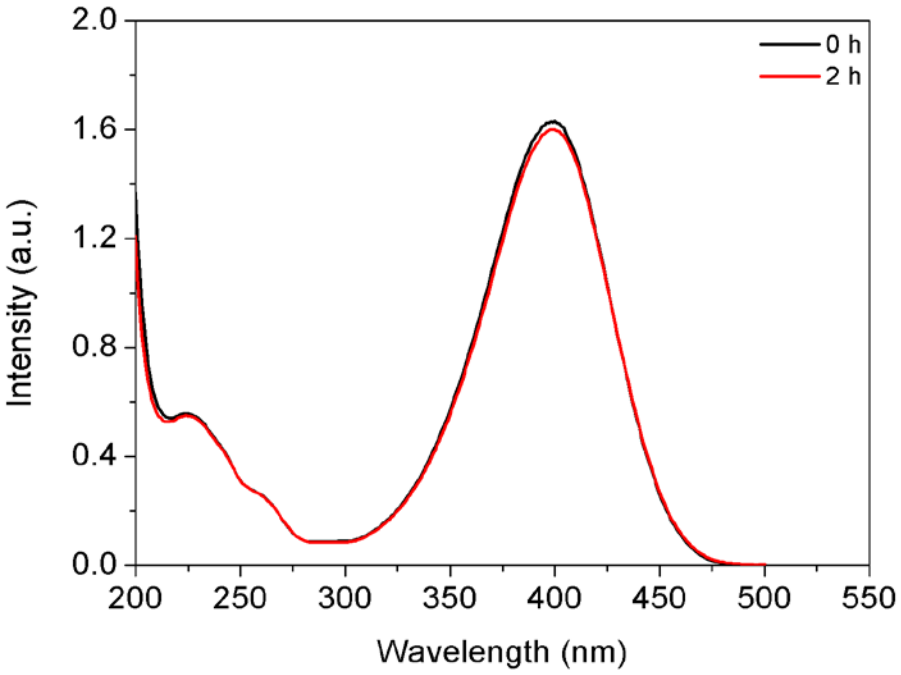

Fig. S5 UV-vis absorption spectra of 4-NP in the presence of the PANINFs and $NaBH_4$ for 0 and 2 h.

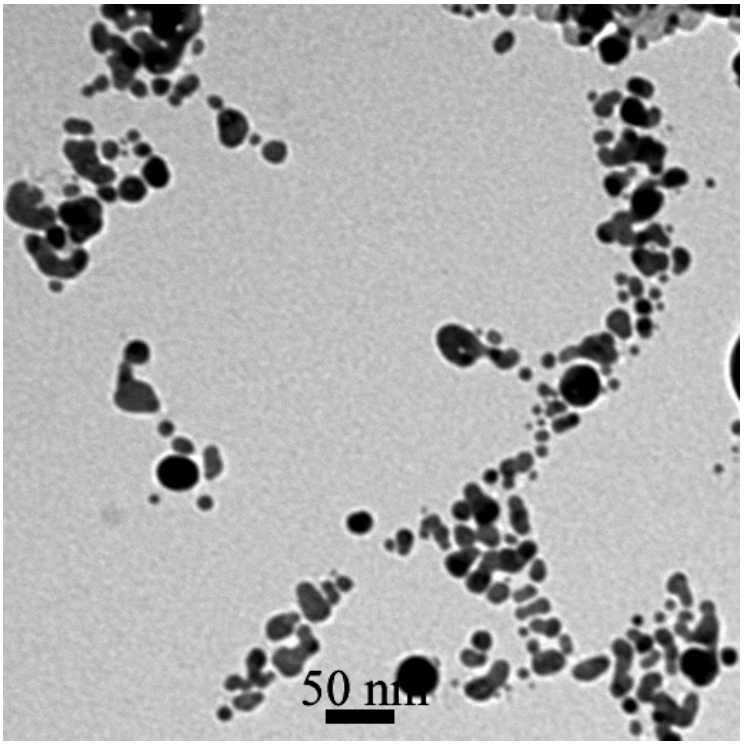

Fig. S6 TEM image of citrate-stabilized AgNPs.

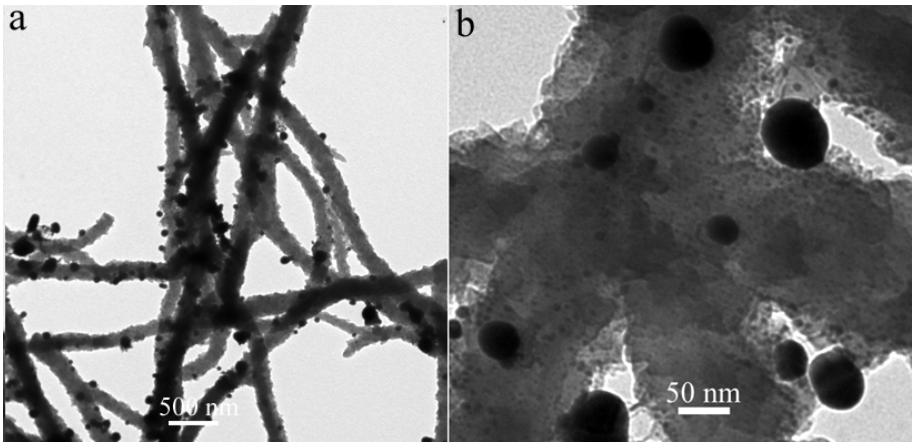

Fig. S7 (a**)** Low and (b) high magnification TEM images of AgNPs/PANINFs composites after the reduction reaction.

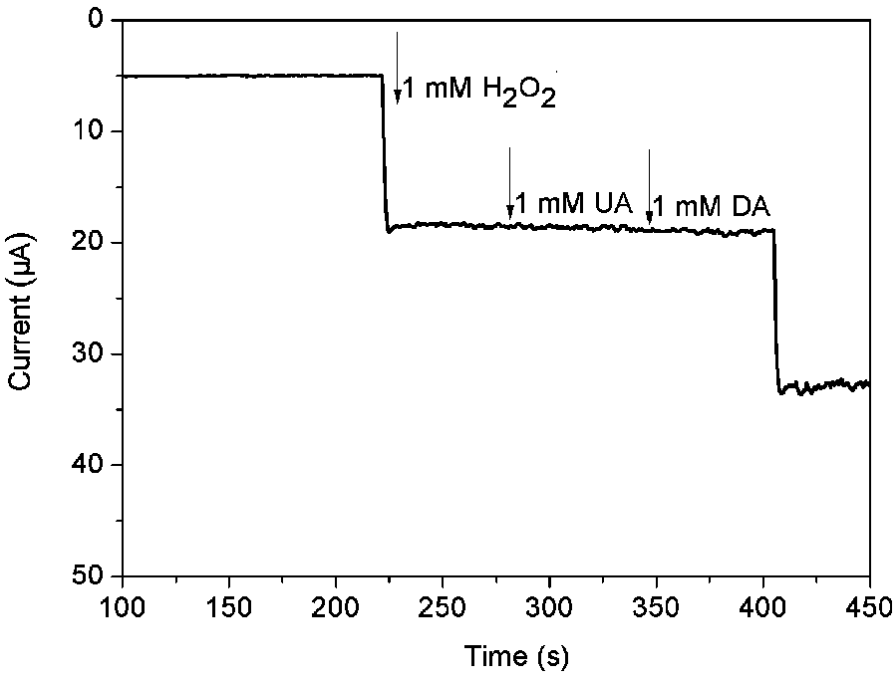

Fig. S8 The current responses of AgNPs/PANINFs/GCE to the sequential additions of 1.0 mM H_2O_2, 1.0 mM UA and 1.0 mM DA.

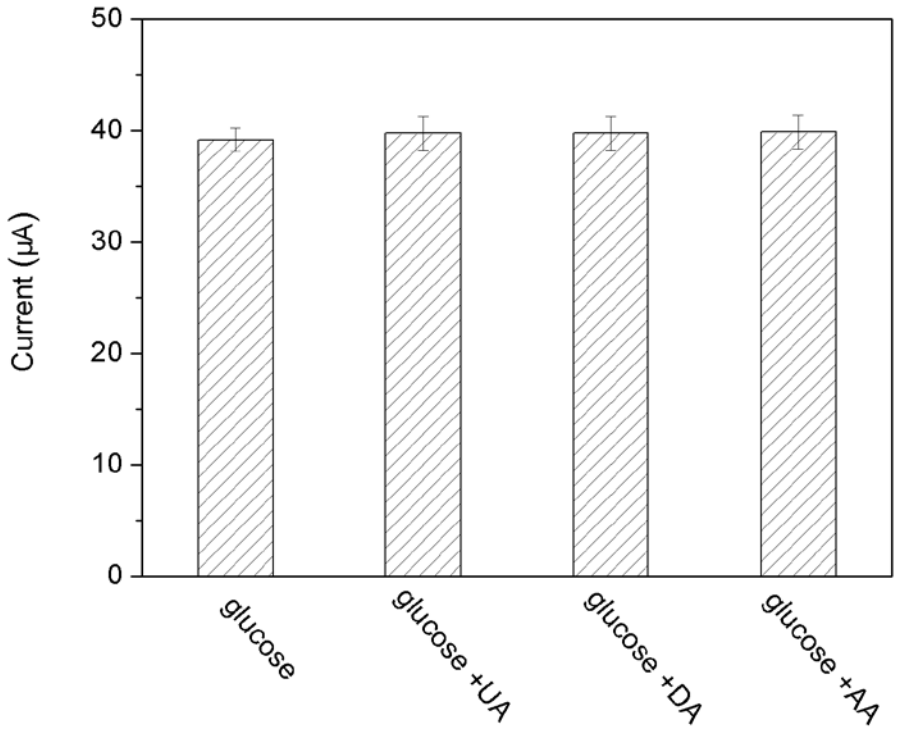

Fig. S9 Comparison of the responses of GOD/AgNPs/PANINFs/GCE to the addition of 2 mM glucose, 2 mM glucose with 0.1 mM ascorbic acid (UA), 2 mM glucose with 0.1 mM uric acid (DA), and 2 mM glucose with 0.1 mM dopamine (UA) **i**n O_2–saturated 0.2 M PBS (pH 7.4) at -0.58 V.

Type of electrodes	Performance		References
	LOD (μM)	Linear range (mM)	
GOD-GN-CS/GCE	20	0.08-12	1
GOD-GN-AuNPs-CS/GCE	180	2-14	2
GOD-GN-AuNPs-CS/GCE	376	1-6	3
GOD/Au_{nano}/Pt_{nano}/CNT/AuE	400	0.5-17.5	4
GOD/Ppy/PtE	—	37.6	5
GOD/AgNPs/PANINFs/GCE	250	1-12	This work

Table S1 A comparison of this work with literature work regarding the performance of the glucose assay using different modified electrodes.

References

1. X. Kang, J. Wang, H. Wu, A. Aksay, J. Lin and Y. Lin, *Biosens. Bioelectron.*, 2009, **25**, 901.
2. C. Shan, H. Yang, D. Han, Q. Zhang, A. Ivaska and L. Niu, *Biosens. Bioelectron.*, 2010, **25**, 1070.
3. M. H. Yang, B.G. Choi, H. Park, W. H. Hong, S. Y. Lee andT. J. Park, *Electroanalysis*, 2010, **22**, 1223.
4. X. Chou, D. Duan, G. Shen and R. Yu, *Talanta*, 2007, **71**, 2040.
5. Y. M. Uang and T. C. Chou, *Biosens. Bioelectron.*, 2003, **19**, 141.