

Supporting Information

Nitrite-Enhanced Charge Transfer to and from Single Polyaniline Nanotubes

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1. Nanoimpacts of individual PANI nanotubes at various potentials in the presence of nitrite

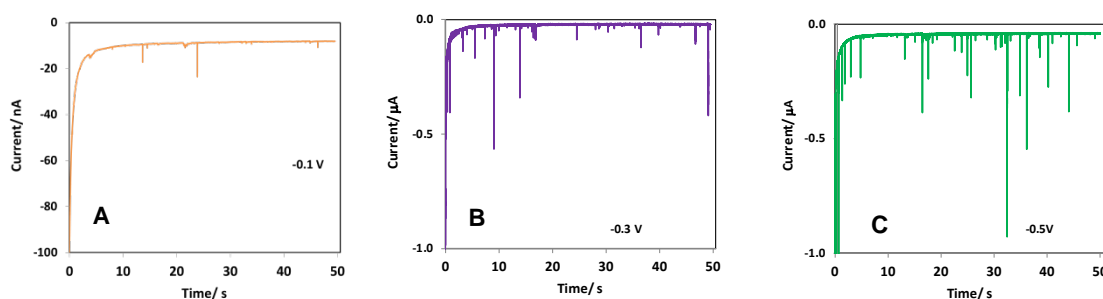


Figure S1 (A-C) Representative chronoamperometric scans in 0.2 M HSO₄ solution containing 0.02 g L⁻¹ PANI nanotube suspension and 3 mM nitrite applying various potentials of -0.1 V, -0.3 V and -0.5 V.

2. Preparation of PANI nanotubes

Polyaniline (PANI) hollow fibres were fabricated using a previously described method ^[1]. The detailed procedures are described in the supporting information. Briefly, the self-made electrospun polystyrene (PS) nanofiber with the average size of 156 ± 60 nm was treated in concentrated sulfuric acid (98%, w/w) followed by rinsing with water to get the sulfonated PS. After impregnation of the sulfonated PS with 150 mM aniline hydrochloride solution overnight, the oxidation polymerisation of aniline results in the formation of PANI in the presence of ammonium persulfate with the mole ratio of ammonium persulfate and aniline of 1:1 in 1 M HCl solution. Subsequently, the resulting product was washed with water and ethanol and dried overnight in a vacuum oven at 60 °C. Finally, the inner core of PANI-covered fibre was dissolved by tetrahydrofuran to obtain the PANI hollow fibres. After washing with 1 M HCl, the obtained PANI mainly exists in its metallic conductive emeraldine salt form, as evidenced via ¹³C NMR by MacDiarmid^[2]. The detailed characterization of the PANI hollow fibres was performed previously ^[1a].

References:

- [1] a) X. Ma, J. Yang, W. Cai, G. Zhu, J. Liu, *Chemical Research in Chinese Universities* **2016**, 32, 702-708; b) Y. Yang, Y. Chu, F. Yang, Y. Zhang, *Materials Chemistry and Physics* **2005**, 92, 164-171; c) J. Liu, G. Zhu, X. Li, C. Batchelor-McAuley, S. V. Sokolov, R. G. Compton, *Applied Materials Today* **2017**, 7, 239-245.
- [2] T. Hjertberg, W. Salaneck, I. Lundstrom, N. Somasiri, A. MacDiarmid, *Journal of Polymer Science: Polymer Letters Edition* **1985**, 23, 503-508.