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

Supporting information

A highly efficient gold/electrospun PAN fibers material for improved laccase biocathodes for biofuel cell applications

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SI1. Design of the Si/PAN/Au electrodes

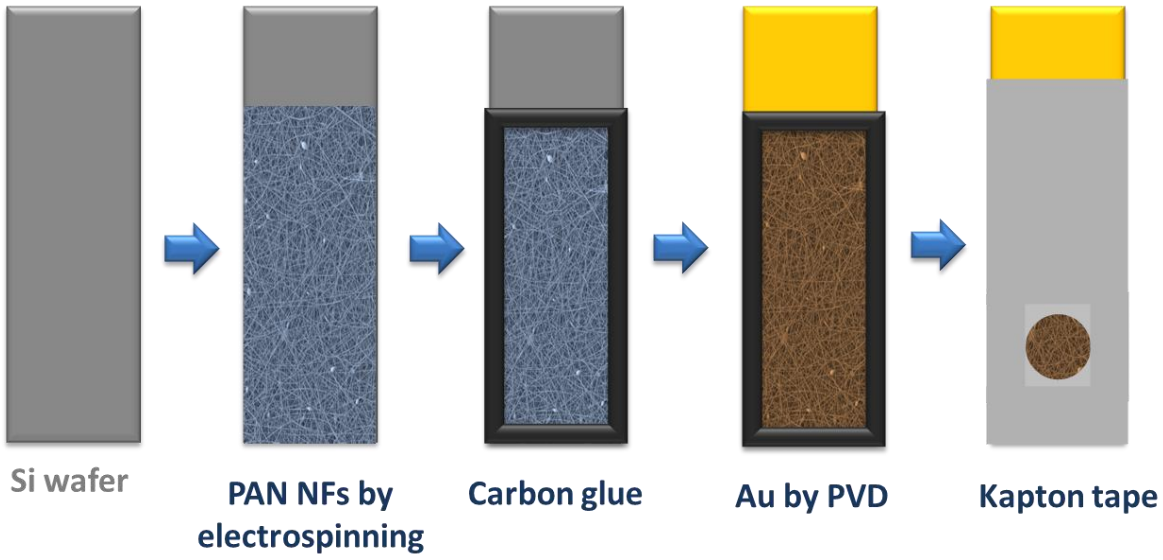

Figure SI1a. Schema of the design of PAN/Au NFs electrodes

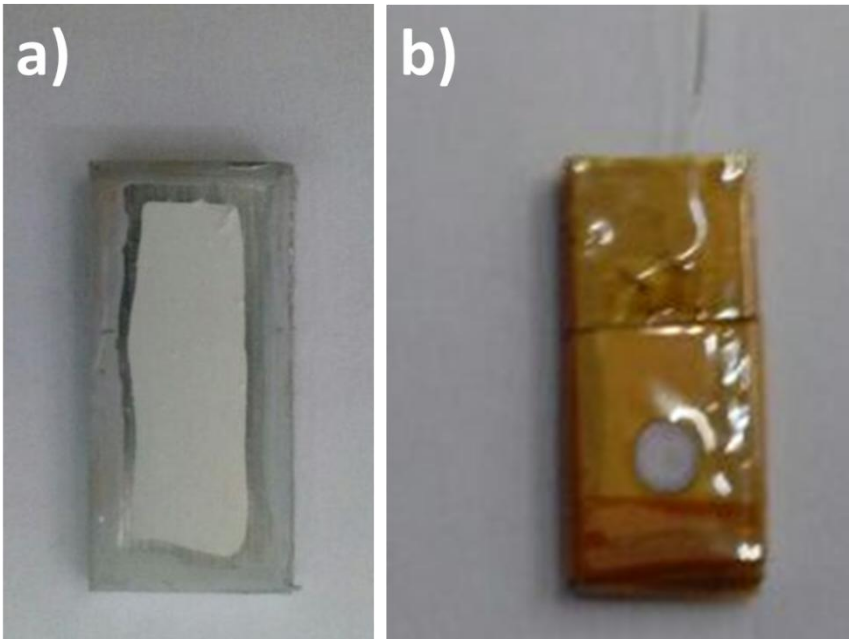

Figure SI1b. Digital micrograph of the PAN/Au electrodes.

SI2. Cross section view of Si/PAN/Au electrodes

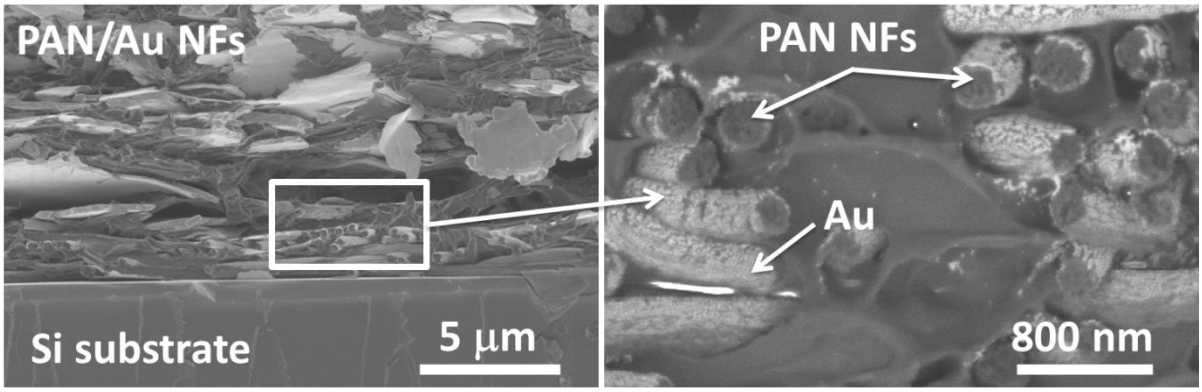

Figure SI2. Cross section SEM images of PAN/Au NFs electrodes

SI3. Cracks observed on thick Au layers

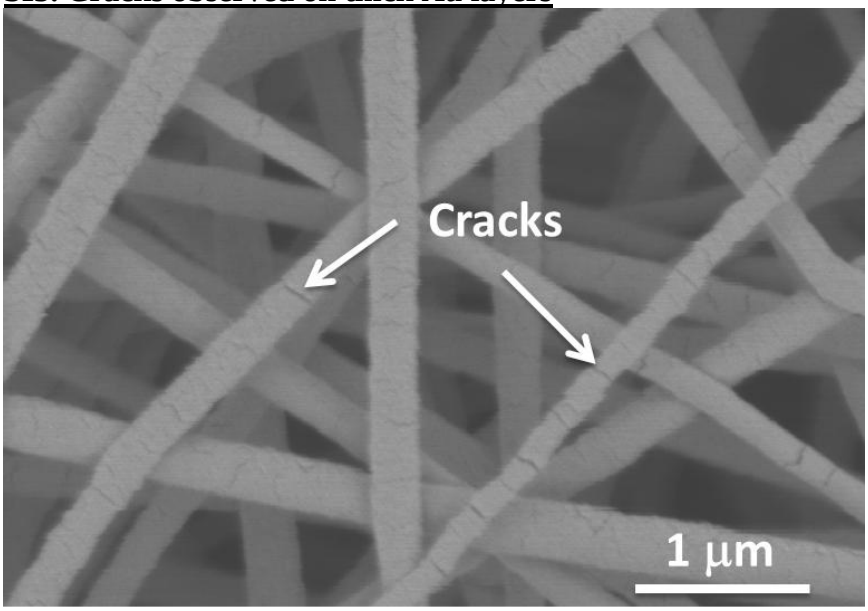

Figure SI3. SEM of PAN/Au NFs obtained by electrospinning for 240 s followed by sputtering of 284 nm of Au layer

SI4. PAN NFs biocathode activity towards O_2 reduction with and without immobilized ABTS

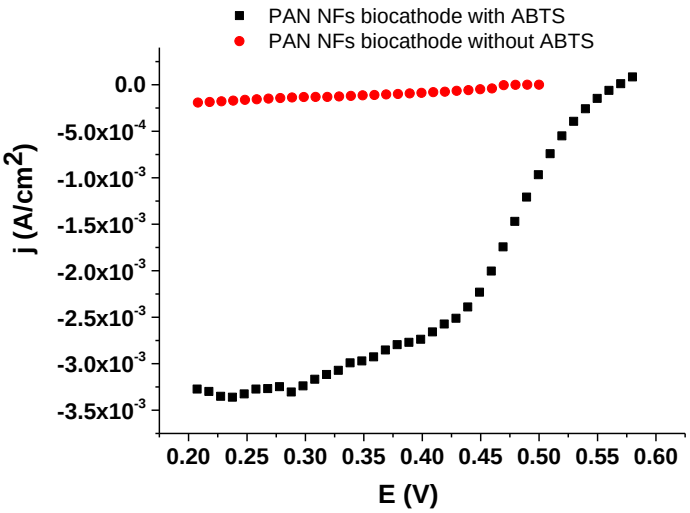

Figure SI4. Polarization curves of a PAN NFs biocathode with and without immobilized ABTS in O_2-saturated phosphate solution (pH 5, 0.1M). Scan rate 3.3 mV s^{-1}.

SI5. Characterization of the bioanode

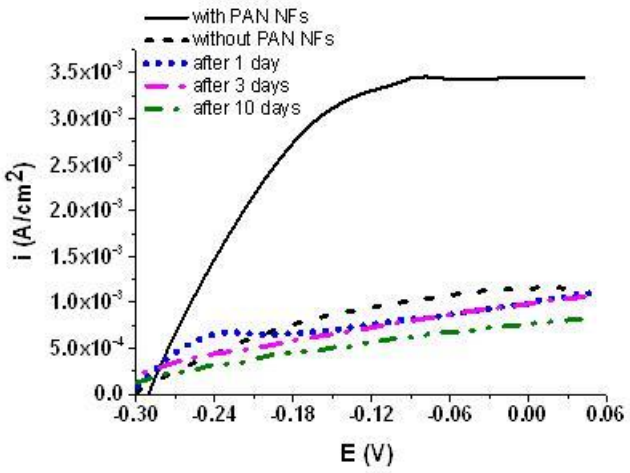

Figure SI5. Polarization curves of a bioanode with and without PAN NFs in phosphate solution (pH 9, 0.1M) with 160 µL ethanol. Evolution of the polarization curves of the PAN NFs bioanode with time (after one, three, and ten days). Scan rate 3.3 mV s^{-1}.

SI6. Characterization of the bioanode

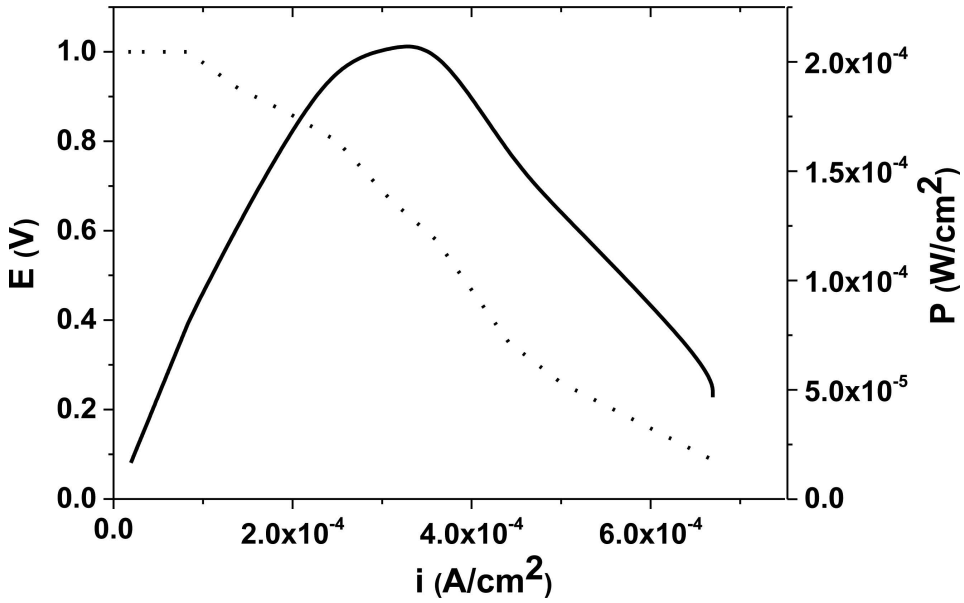

Figure SI6. Typical cell voltage (dashed line) and resulting power density (bold line) versus current density of the constructed laccase biocathodes with respect to ADH bioanodes, evaluated on the basis of the cell voltage upon changing the external resistance between 1kΩ and 1MΩ.