CARBON NANOFIBER MESOPOROUS FILMS: EFFICIENT PLATFORMS FOR BIO-HYDROGEN OXIDATION IN BIOFUEL CELLS

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Supporting Information

Figure SI 1: CV curves for H_2 oxidation on a 855 µg.cm^{-2} CNF-modified PG electrode with no MbH1 in 50 mM HEPES buffer, pH 6.8 at 60°C under H_2 atm. in quiescent conditions. Scan rate was 5 mV.s^{-1}.

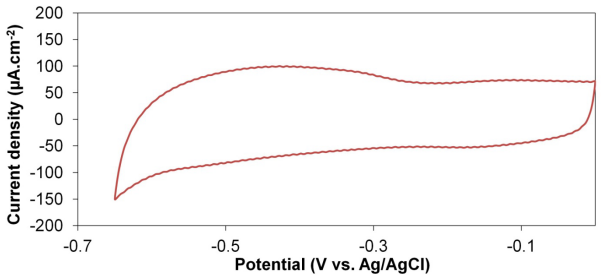

Figure SI 2: Adsorption kinetics (+) and stability of the catalytic signal (●) for H_2 oxidation by 2 µM MbH1 as a function of the incubation time on 855 µg.cm^{-2} CNF_H2-modified PG electrode. The currents are measured from CV curves for H_2 oxidation by MbH1 adsorbed on CNF_H2-modified PG electrodes in 50 mM HEPES buffer, pH 6.8 at 60°C under H_2 atm in quiescent conditions. The stability is reported as a percentage of the remaining current.

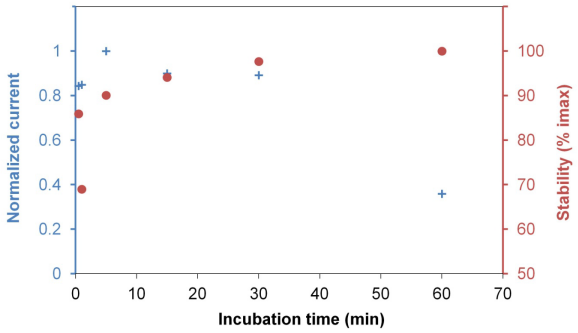

Figure SI 3: Impedance spectra recorded at a 36 µg.cm^{-2} CNF_H2-modified electrode with 2µM MbH1 adsorbed for 30 min according to procedure (a) (+), and at a 36 µg.cm^{-2} CNF_H2-modified electrode mixed with 2µM MbH1 according to procedure (b) (+).

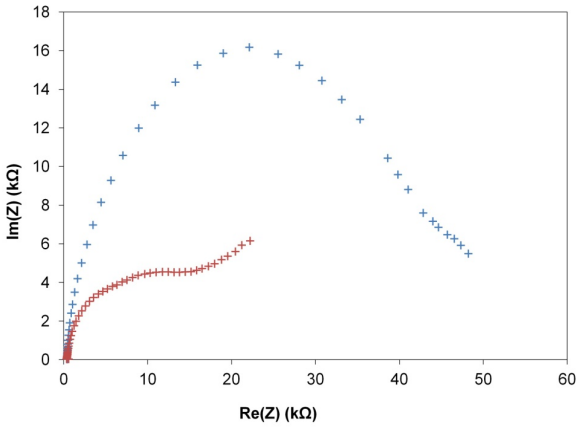

Figure SI 4: CV curves for H_2 oxidation by 2µM MbH1 adsorbed for 30 min on a bare PG electrode (A) or on a 855 µg.cm^{-2} CNF_H2-modified PG electrode (B) in 50 mM HEPES buffer, pH 6.8 at 60°C under H_2 atm in H2 OFF conditions (blue curves) and H2 ON conditions at a H_2 flow rate 1 cm^3.s^{-1} (red curves). In (A) and (B) the blue and red CV curves are two consecutive cycles. Scan rate was 5 mV.s^{-1}.

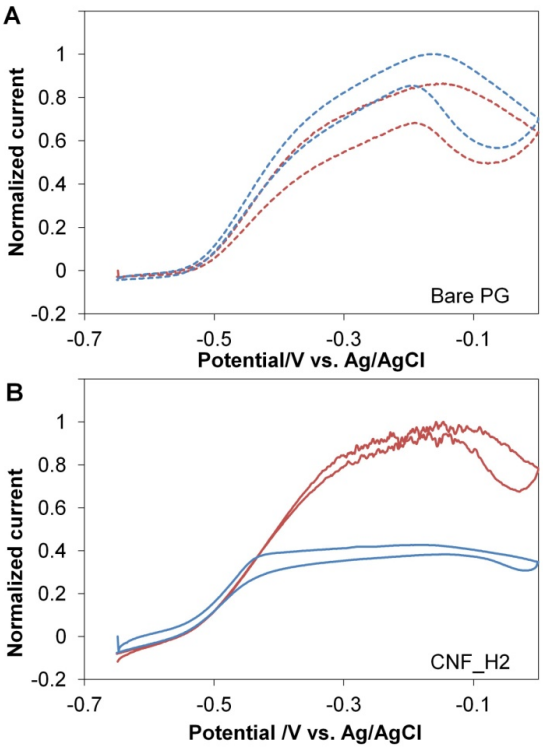

Figure SI 5: Adsorption isotherms (A) and kinetics (B) of MbH1 for two CNF deposits on a PG electrode. The currents are measured from CV curves for H_2 oxidation by MbH1 adsorbed on CNF_H2-modified PG electrodes in 50 mM HEPES buffer, pH 6.8 at 60°C, under H_2 atm. in quiescent conditions (blue marks), and H2 ON conditions at a H_2 flow rate 1 $cm^3.s^{-1}$ (red marks). In (A) the circles stand for a 285 $\mu g.cm^{-2}$ CNF_H2-modified PG electrode and the crosses for a 855 $\mu g.cm^{-2}$ CNF_H2-modified PG electrode.

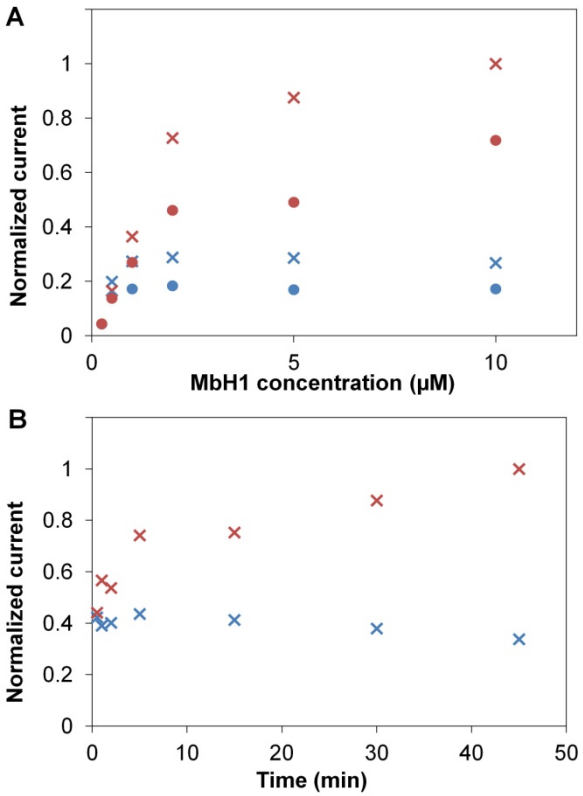

Figure SI 6: CV curves for H_2 oxidation by 2µM MbH1 adsorbed at a PG electrode modified by 1140 µg.cm^{-2} CNF under a H_2 flow rate of 5.2 cm^3.s^{-1}. V = 5 mV.s^{-1}, 50 mM HEPES buffer, pH 6.8, 60 °C.