

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

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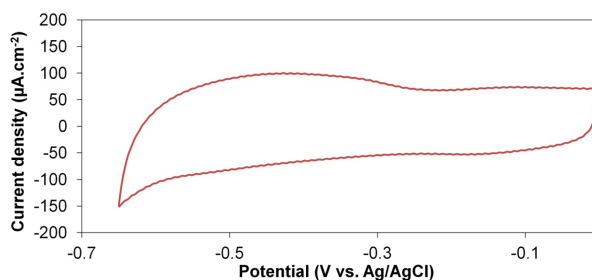
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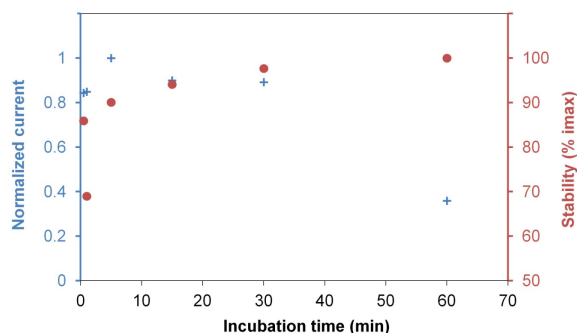
e-mail : [lojou@imm.cnrs.fr](mailto:lojou@imm.cnrs.fr)

### Supporting Information

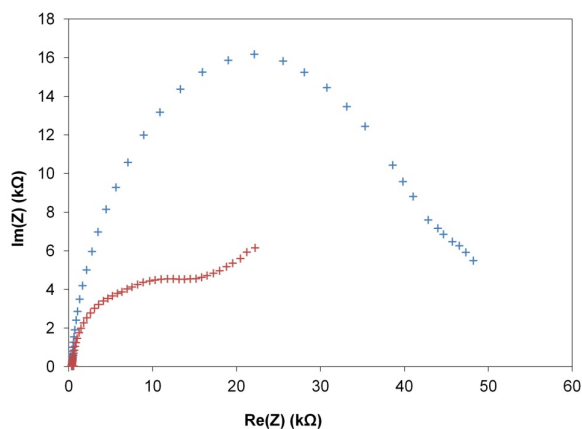
**Figure SI 1:** CV curves for H<sub>2</sub> oxidation on a 855  $\mu\text{g}\cdot\text{cm}^{-2}$  CNF-modified PG electrode with no MbH1 in 50 mM HEPES buffer, pH 6.8 at 60°C under H<sub>2</sub> atm. in quiescent conditions. Scan rate was 5  $\text{mV}\cdot\text{s}^{-1}$ .



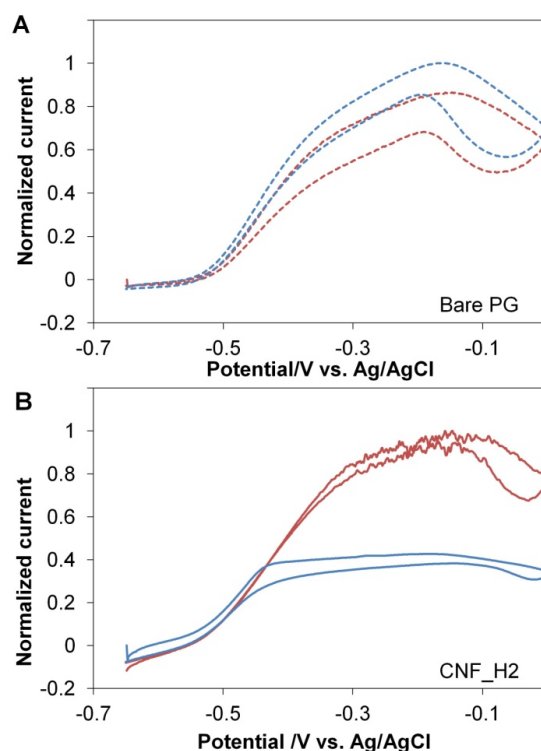
**Figure SI 2:** Adsorption kinetics (+) and stability of the catalytic signal (●) for H<sub>2</sub> oxidation by 2  $\mu\text{M}$  MbH1 as a function of the incubation time on 855  $\mu\text{g}\cdot\text{cm}^{-2}$  CNF\_H2-modified PG electrode. The currents are measured from CV curves for H<sub>2</sub> oxidation by MbH1 adsorbed on CNF\_H2-modified PG electrodes in 50 mM HEPES buffer, pH 6.8 at 60°C under H<sub>2</sub> atm in quiescent conditions. The stability is reported as a percentage of the remaining current.



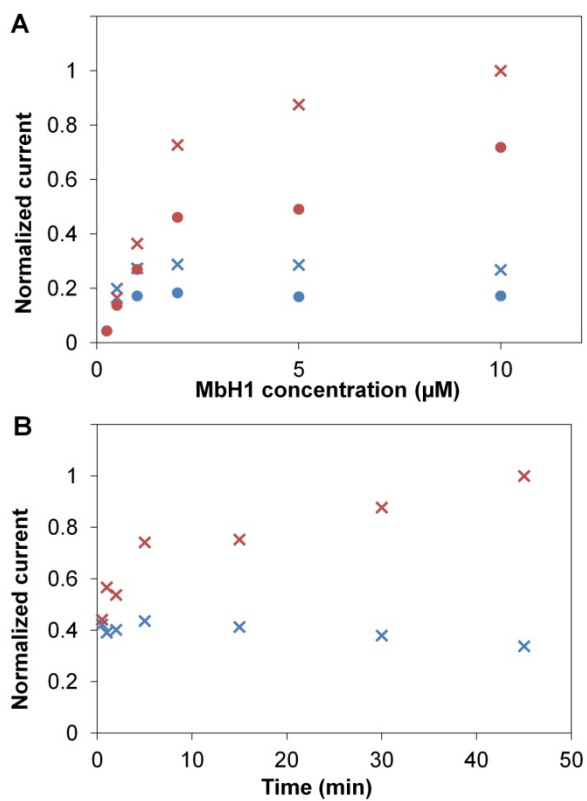
**Figure SI 3:** Impedance spectra recorded at a  $36 \mu\text{g}\cdot\text{cm}^{-2}$  CNF\_H2-modified electrode with  $2\mu\text{M}$  MbH1 adsorbed for 30 min according to procedure (a) (+), and at a  $36 \mu\text{g}\cdot\text{cm}^{-2}$  CNF\_H2-modified electrode mixed with  $2\mu\text{M}$  MbH1 according to procedure (b) (+).



**Figure SI 4:** CV curves for  $\text{H}_2$  oxidation by  $2\mu\text{M}$  MbH1 adsorbed for 30 min on a bare PG electrode (A) or on a  $855 \mu\text{g}\cdot\text{cm}^{-2}$  CNF\_H2-modified PG electrode (B) in 50 mM HEPES buffer, pH 6.8 at  $60^\circ\text{C}$  under  $\text{H}_2$  atm in  $\text{H}_2$  OFF conditions (blue curves) and  $\text{H}_2$  ON conditions at a  $\text{H}_2$  flow rate  $1 \text{ cm}^3\cdot\text{s}^{-1}$  (red curves). In (A) and (B) the blue and red CV curves are two consecutive cycles. Scan rate was  $5 \text{ mV}\cdot\text{s}^{-1}$ .



**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<sub>2</sub> oxidation by MbH1 adsorbed on CNF\_H2-modified PG electrodes in 50 mM HEPES buffer, pH 6.8 at 60°C, under H<sub>2</sub> atm. in quiescent conditions (blue marks), and H<sub>2</sub> ON conditions at a H<sub>2</sub> flow rate 1 cm<sup>3</sup>.s<sup>-1</sup> (red marks). In (A) the circles stand for a 285 μg.cm<sup>-2</sup> CNF\_H2-modified PG electrode and the crosses for a 855 μg.cm<sup>-2</sup> CNF\_H2-modified PG electrode.



**Figure SI 6:** CV curves for  $\text{H}_2$  oxidation by  $2\mu\text{M}$  MbH1 adsorbed at a PG electrode modified by  $1140\ \mu\text{g}\cdot\text{cm}^{-2}$  CNF under a  $\text{H}_2$  flow rate of  $5.2\ \text{cm}^3\cdot\text{s}^{-1}$ .  $V = 5\ \text{mV}\cdot\text{s}^{-1}$ ,  $50\ \text{mM}$  HEPES buffer, pH 6.8,  $60\ ^\circ\text{C}$ .

