Electronic Supplementary Information to:

An electrochemically functional layer of hydrogenase extract on an electrode of large and tunable specific surface area

Stefanie Schlicht,[a] Loïc Assaud,[a,‡] Moritz Hansen,[b] Markus Lickleder,[a] Mikhael Bechelany,[c] Mirjam Perner [b] and Julien Bachmann[a,*]

[a] *Friedrich-Alexander University Erlangen-Nürnberg, Department of Chemistry and Pharmacy, Egerlandstrasse 1, D-91058 Erlangen, Germany*

[b] *University of Hamburg, Faculty of Mathematics, Informatics and Biology, Biozentrum Klein Flottbek, Ohnhorststrasse 18, D-22609 Hamburg, Germany*

[c] *Institut Européen des Membranes, IEMM, ENSCM UM2 CNRS UMR5635, Place Eugène Bataillon, F-34095 Montpellier Cedex 5, France*

‡ Current address: ICMMO – Bât. 410, Université Paris-Sud 11, Rue du Doyen Georges Poitou, F-91405 Orsay Cedex, France

* Corresponding author: julien.bachmann@fau.de

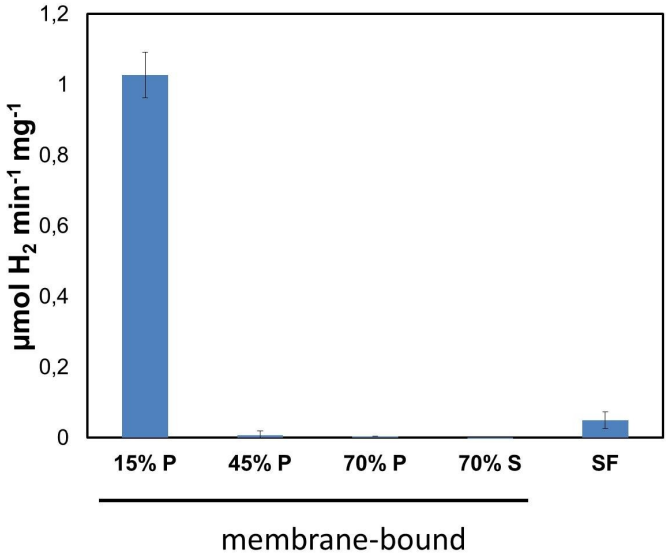

Figure S1. H_2 uptake activity of the different *E. coli* enzyme fractions. Enzyme activities were determined after precipitation by different concentrations of ammonium sulfate and resuspension of the pellet (membrane-fraction), in the supernatant after precipitation at 70% ammonium sulfate and of soluble enzymes. P, resuspended pellet; S, supernatant; SF, soluble fraction.

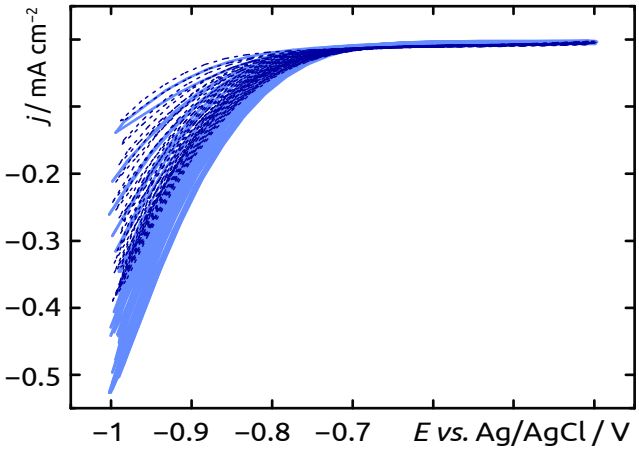

Figure S2. Cyclic voltammetry (CV) of fiber-based electrodes (electrospun for 6 h) with and without hydrogenase coating (solid light blue and dotted dark blue lines, respectively) recorded at 50 mV s^{-1} in buffer electrolyte (pH 8). The overpotential η is calculated from the experimental potential E measured vs. Ag/AgCl as $\eta = E + 0.67$ V. The CVs were initiated at $E = -0.40$ V and the first 20 cycles are displayed. The current increases over the course of the first 20 cycles for both samples in a similar manner.

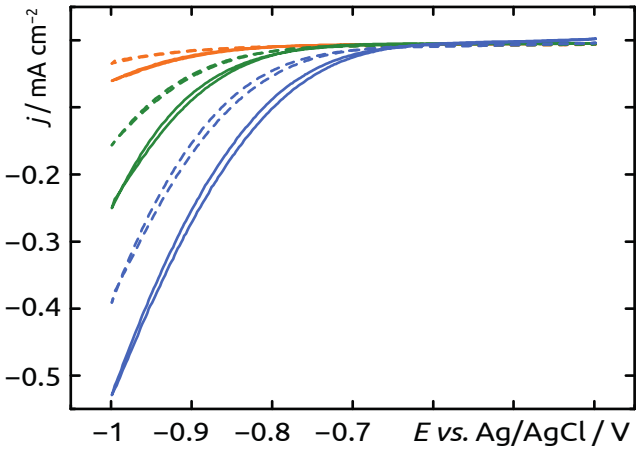

Figure S3. Cyclic voltammetry of fiber-based electrodes with three distinct fiber amounts: electrospun for 1 h (orange), 3 h (green), and 6 h (blue), before (dotted lines) and after hydrogenase treatment (continuous lines). The data were taken at 50 mV s^{-1} in buffer electrolyte (pH 8). The overpotential η is calculated from the experimental potential E measured vs. Ag/AgCl as $\eta = E + 0.67$ V. The CVs were initiated at $E = -0.40$ V and 19 cycles were performed before the cycle displayed was recorded.

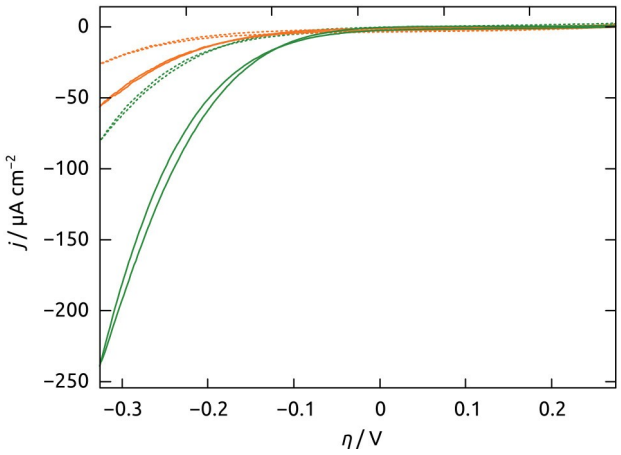

Figure S4. Cyclic voltammograms of two samples from **Figure S3** taken in the same conditions, freshly prepared (solid lines) and 7 hours later (dotted lines). The data serve as a control experiment: the activity loss corresponds to hydrogenase decomposition, and supports the assignment of the large initial electrochemical activity to the enzymes.