Electrodeposition of Fe-Complexes on Oxide Surfaces for Efficient OER Catalysis

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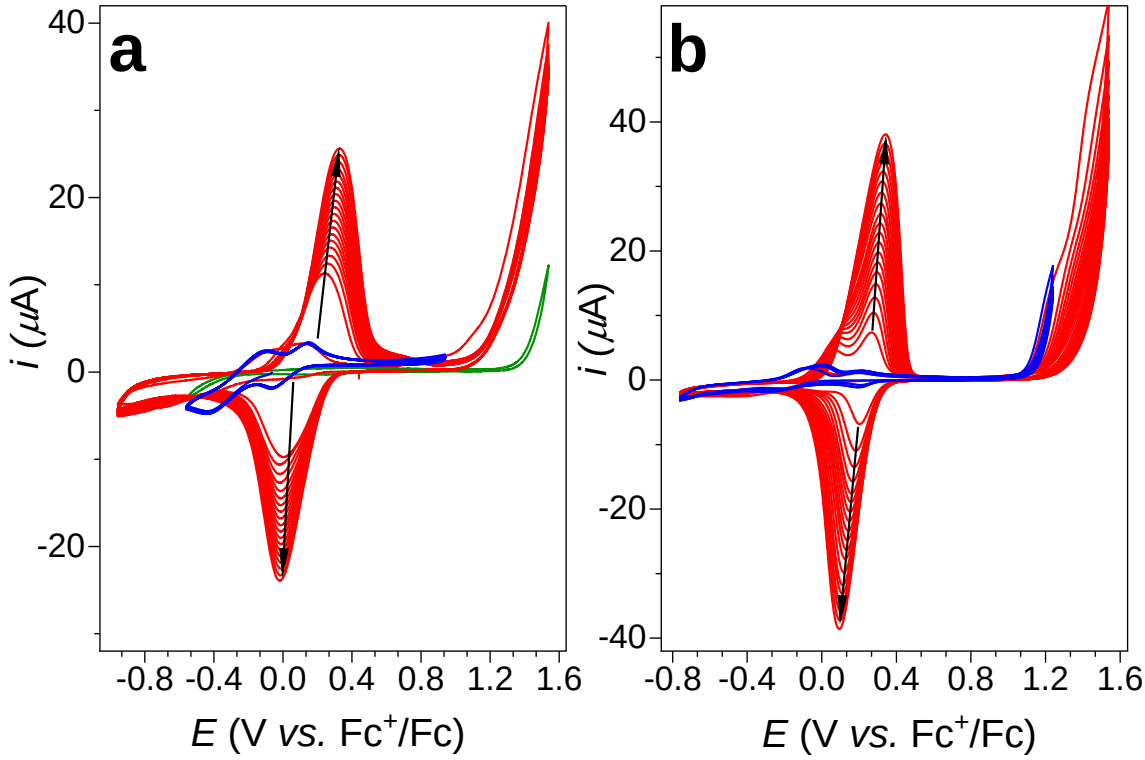

Figure S1. (a) CV scans of **1** (0.4 mM) in DCM with added H_2O (3 mmol in 0.5 mL acetone) on a BDD electrode (0.071 cm^2); (b) CV scans of **2** (0.4 mM) under the same conditions. Settings: under Ar, ν = 100 mV/s, Pt, and Ag^+/Ag (0.01 M $AgNO_3$, 0.1 M TBAP/acetonitrile), as counter, and reference electrodes, respectively. Red curves: 20 cycles in a broader potential range in both cases show that the anodic oxidation above +1.2 V *vs*. Fc^+/Fc is required for electrodeposition (compare to the blue CVs, 10 cycles, in a narrower potential range). The green CV was recorded in DCM (10 mL) with added H_2O (3 mmol in 0.5 mL acetone) on a BDD electrode (0.071 cm^2) for comparison.

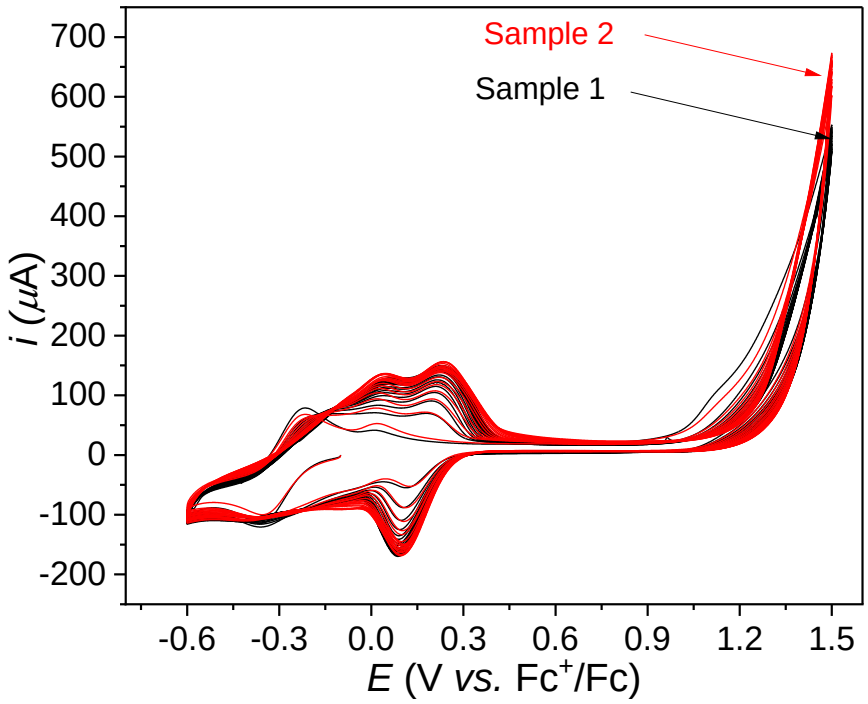

Figure S2. Comparison of two parallel electrodeposition experiments using complex **1** (0.8 mM) on ITO (1.5 cm^2) in DCM with added water (3 mmol in 0.5 mL acetone) illustrating good reproducibility. Settings: under Ar, ν=100 mV/s, 20 cycles, Pt, and Ag^+/Ag (0.01 M $AgNO_3$, 0.1 M TBAP/acetonitrile), as counter, and reference electrodes, respectively. See the analogous experiments on FTO in Fig. 3c for comparison.

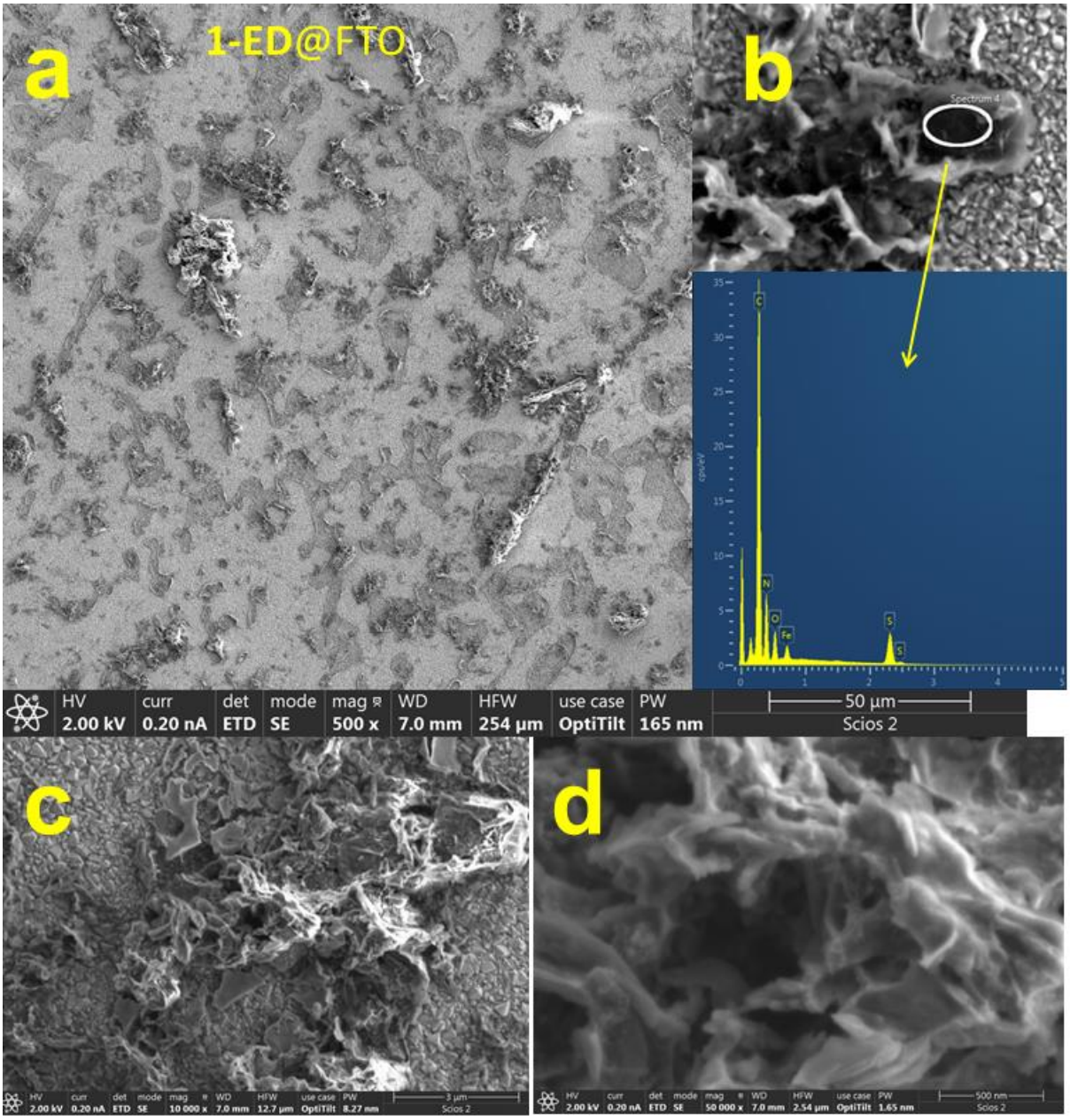

Figure S3. (a) SEM image of **1**-ED@FTO as-prepared and cleansed with MilliQ water to remove salt residues, (b) EDX spectrum of the area within the white circle; (c-d) SEM images at different magnifications (see the footers for experimental settings).

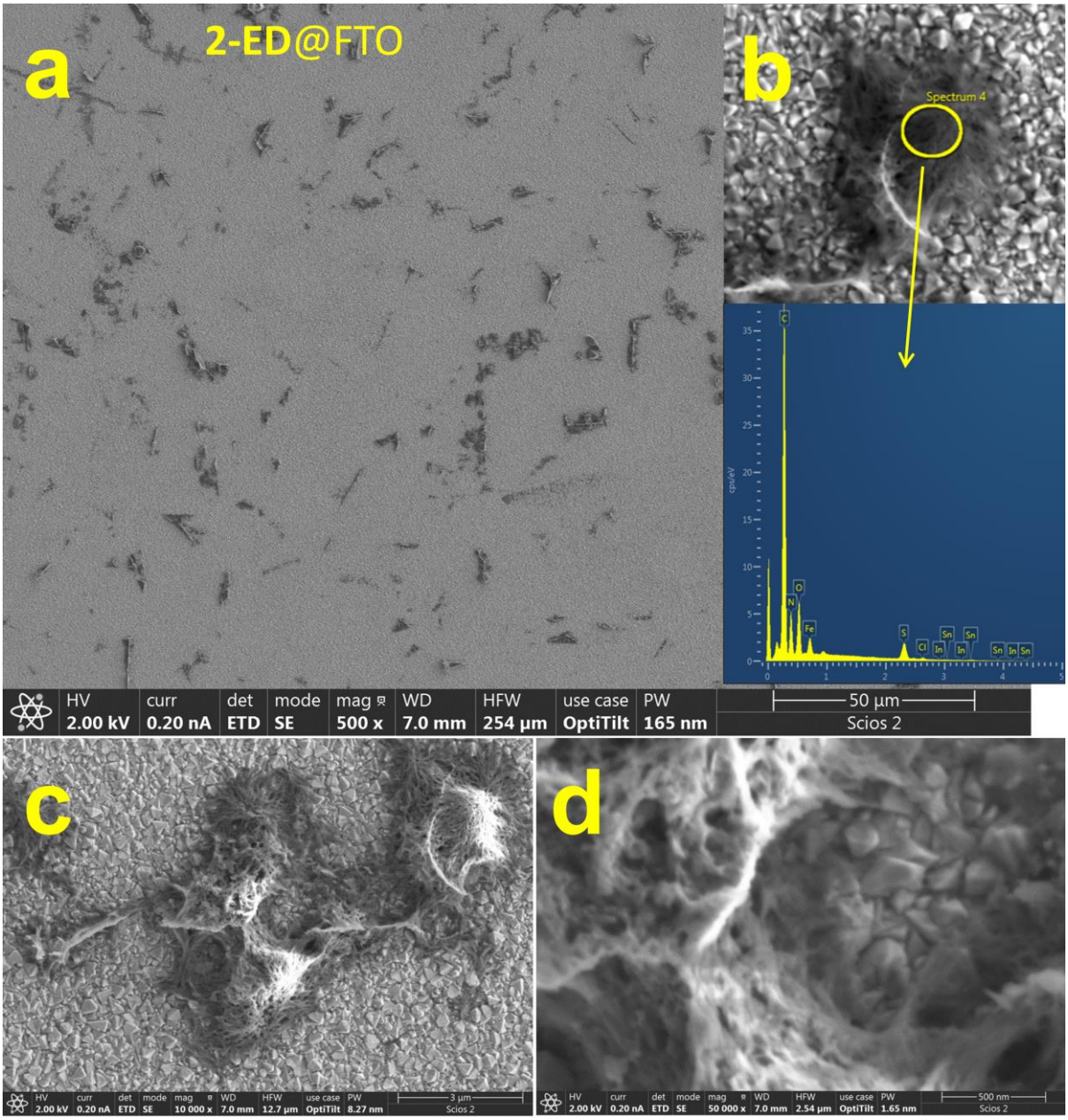

Figure S4. (a) SEM image of **2**-ED@FTO as-prepared and cleansed with MilliQ water to remove salt residues, (b) EDX spectrum of the area within the white circle; (c-d) SEM images at different magnifications (see the footers for experimental settings).

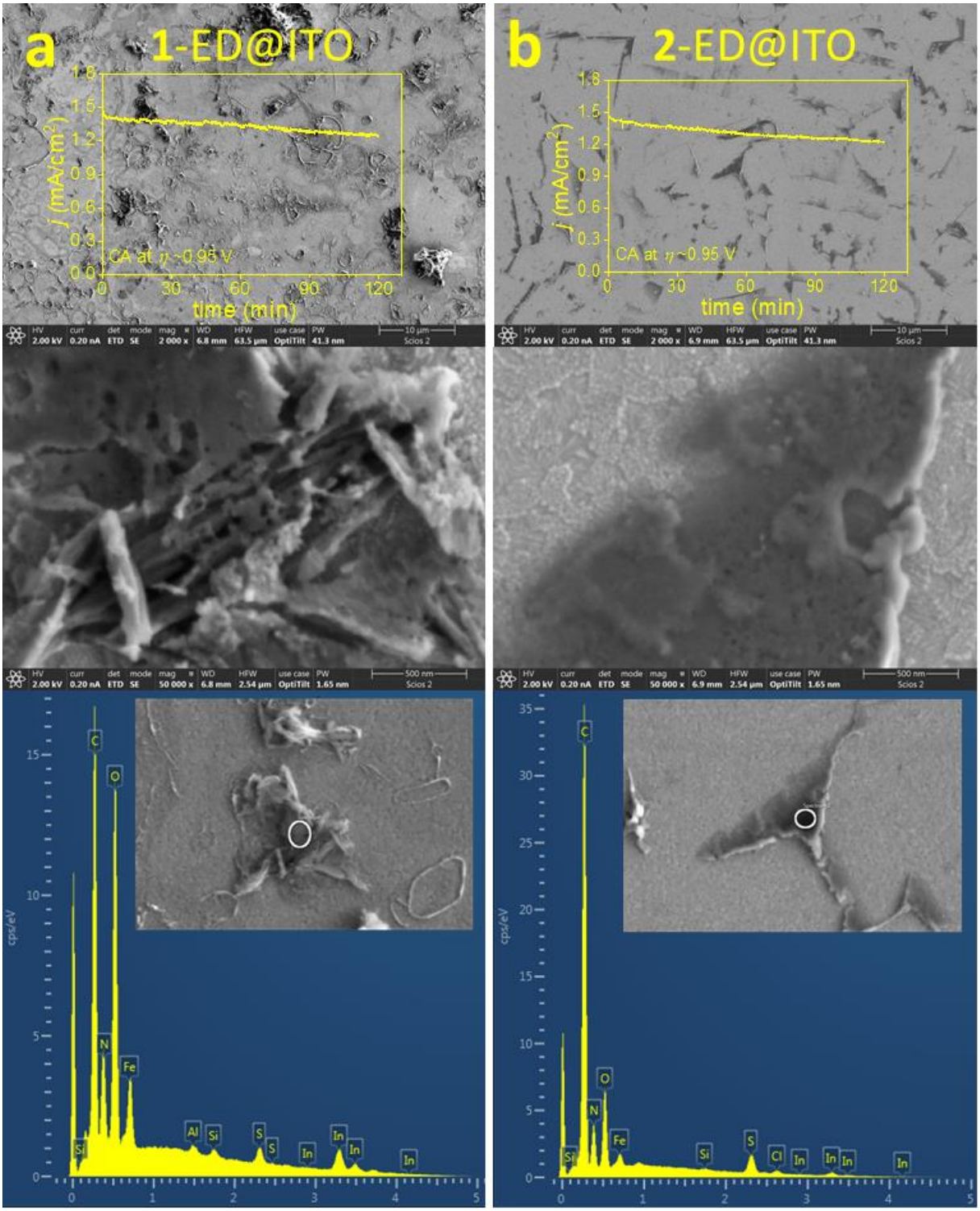

Figure S5. (a) SEM images at different magnifications and EDX spectrum of **1**-ED@ITO as-prepared and cleansed with MilliQ water to remove salt residues, (b) SEM images at different magnifications and EDX spectrum of **2**-ED@ITO as-prepared (see the footers for experimental settings). Insets on the top: CA currents at +1.5 V *vs*. AgCl/Ag by using these electrodes.

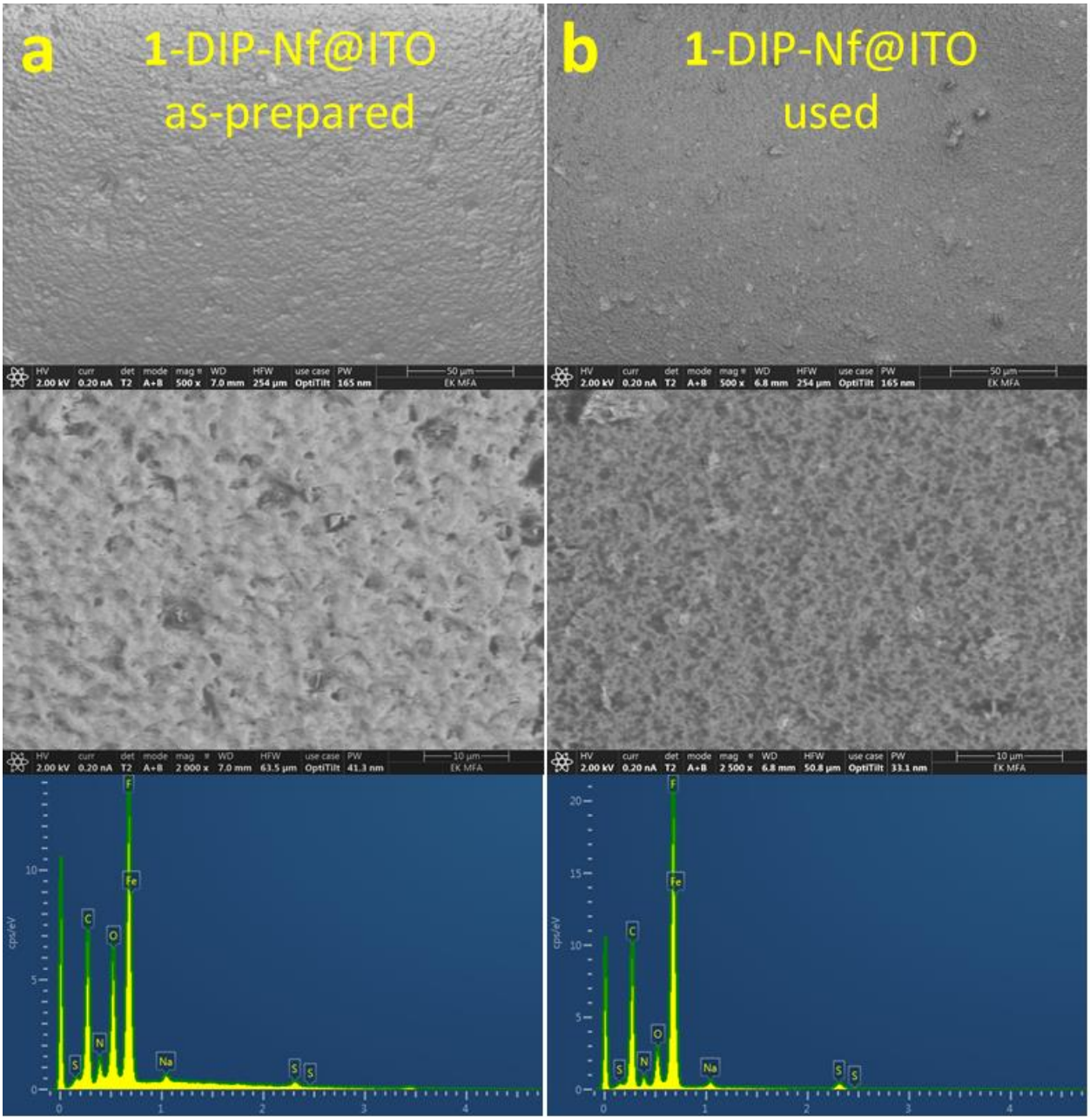

Figure S6. (a) SEM images and EDX spectrum of the as-prepared **1**-DIP-Nf@ITO sample and (b) the same sample after the electrochemical investigations (for details of the follow-up electrochemistry see Fig. 4a-c). The SEM parameters are found in the footers above.