

Supporting Information

γ -FeOOH and amorphous Ni-Mn hydroxide on carbon nanofoam paper electrodes for hybrid supercapacitors

Tuyen Nguyen*, M. Fátima Montemor

CQE - Centro de Química Estrutural, DEQ - Departamento de Engenharia Química, Instituto Superior
Técnico, Universidade de Lisboa, 1049-001 Lisboa, Portugal. *Email: nguyen.tuyen@tecnico.ulisboa.pt

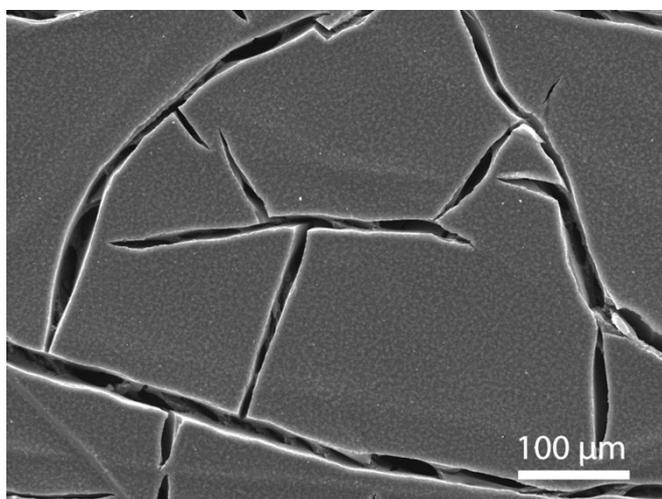


Figure S1. FEG-SEM image of the blank carbon nanofoam paper (CNFP).

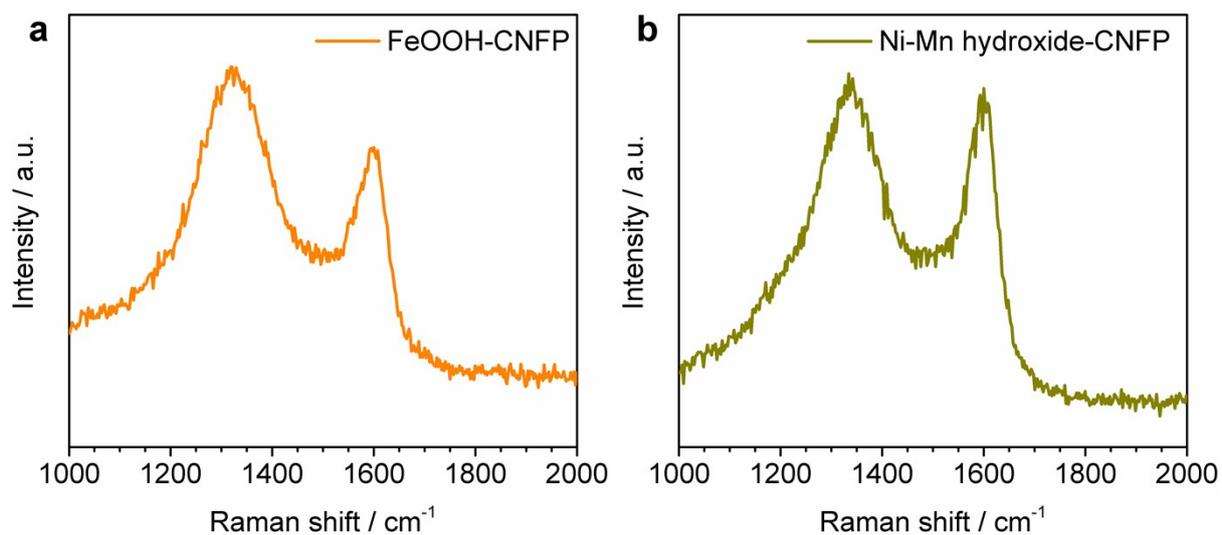


Figure S2. Raman spectra at high wavenumbers (a) FeOOH-carbon nanofoam paper (CNFP) and (b) Ni-Mn hydroxide-CNFP.

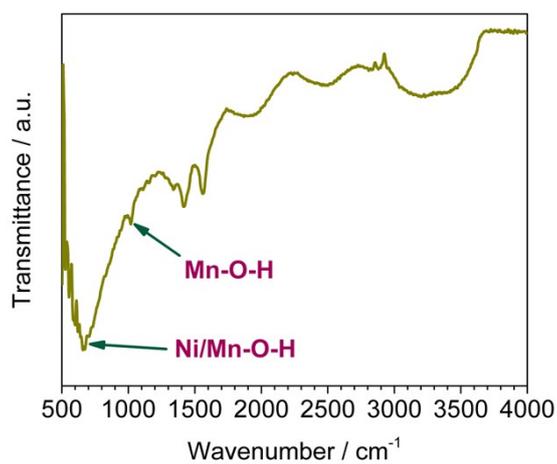


Figure S3. FTIR spectrum of Ni-Mn hydroxide-carbon nanofoam paper (CNFP).

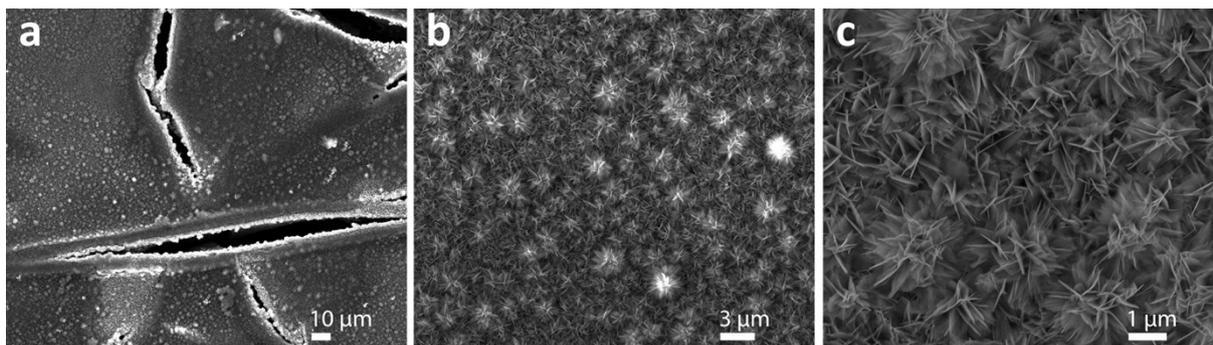


Figure S4. SEM images at different magnifications of FeOOH-carbon nanofoam paper (FH-CNFP) after cycling.

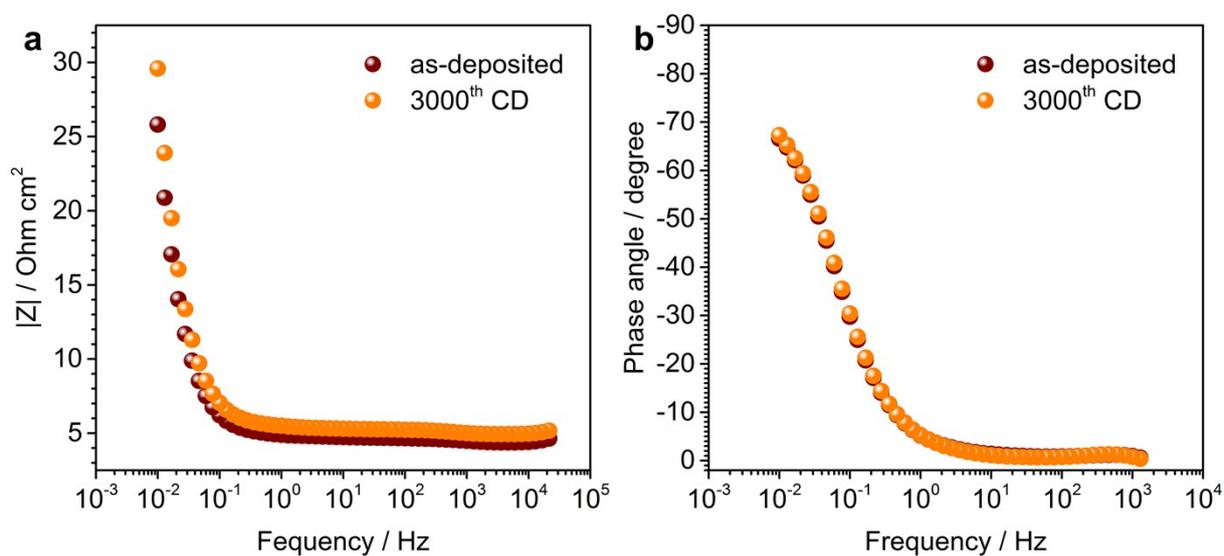


Figure S5. Electrochemical Impedance Bode plots of (a) magnitude and (b) phase angle versus frequency of the as-deposited FeOOH-carbon nanofoam paper (FH-CNFP) electrode and of the electrode after 3000 charge-discharge cycles.

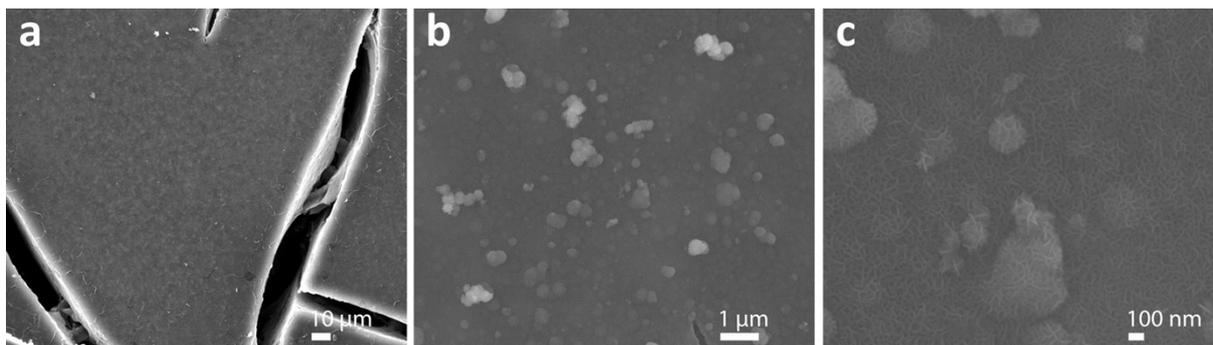


Figure S6. SEM images at different magnifications of Ni-Mn hydroxide-carbon nanofoam paper (NMH-CNFP) after cycling.

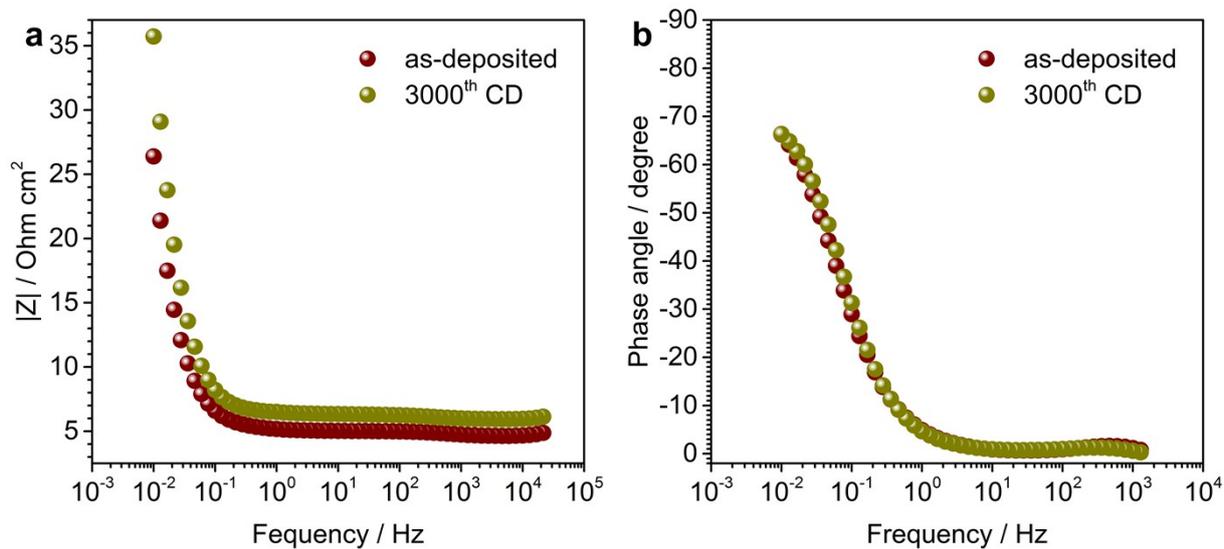


Figure S7. Bode plots of (a) magnitude and (b) phase angle versus frequency of the as-deposited Ni-Mn hydroxide-carbon nanofoam paper (NMH-CNFP) electrode and of the electrode after 3000 charge-discharge cycles.

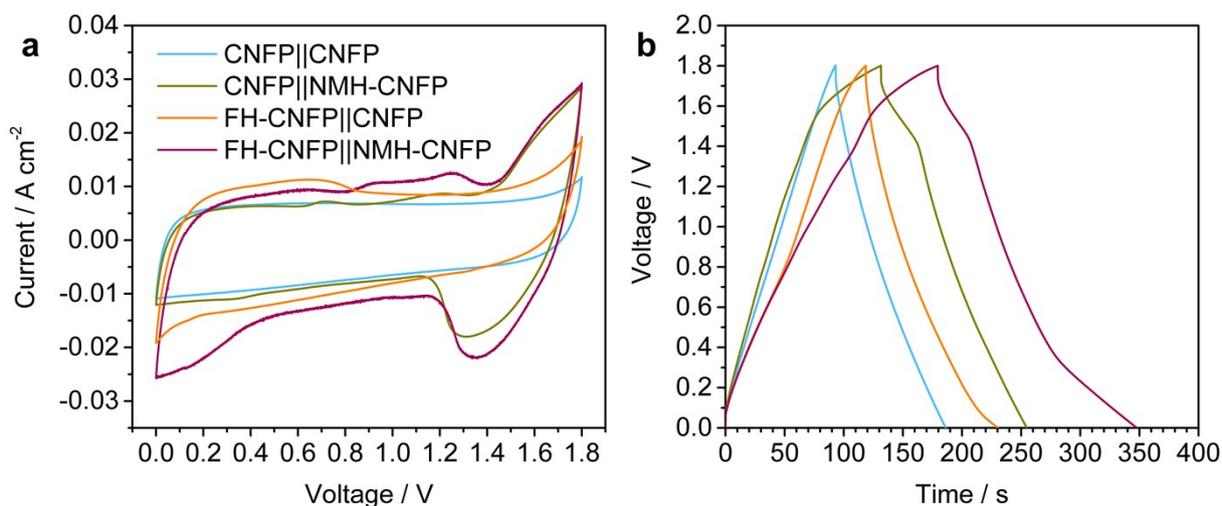


Figure S8. (a) Cyclic voltammograms at 15 mV s⁻¹ and (b) charge-discharge plots at 10 mA cm⁻² in 1 M KOH of different cells: symmetric carbon nanofoam paper (CNFP) || CNFP, asymmetric FeOOH-CNFP (FH-CNFP) || CNFP, asymmetric CNFP || Ni-Mn hydroxide-CNFP (NMH-CNFP) and asymmetric FH-CNFP || NMH-CNFP. A legend in Figure S7a is also applied for Figure S7b.

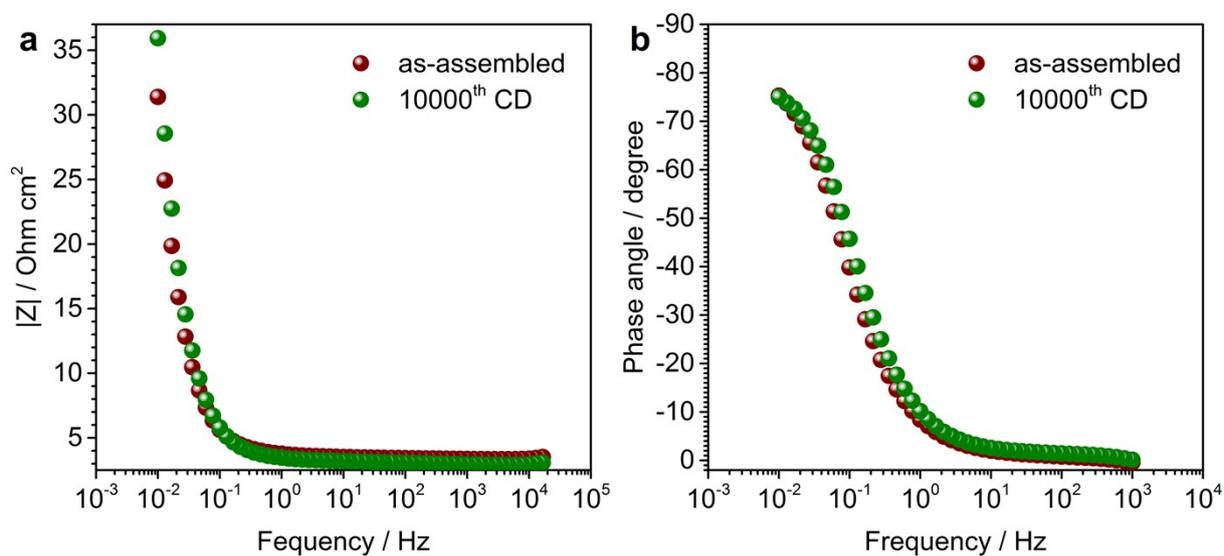


Figure S9. Bode plots of (a) magnitude and (b) phase angle versus frequency of the asymmetric FH-CNFP || NMH-CNFP cell and of the cell after 10000 charge-discharge cycles.