Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Supporting Information

Improving the water splitting performance of nickel electrodes by optimizing pore structure using phase inversion method

Ruigen Ding#, Shengsheng Cui#, Jie Lin, Zijun Sun, Pingwu Du*, Chusheng Chen*

CAS Key Laboratory of Materials for Energy Conversion, Collaborative Innovation Center of Chemistry for Energy Materials, and Department of Materials Science and Engineering, University of Science and Technology of China, Hefei, Anhui 230026, P. R. China

# contributed equally to this work
*To whom correspondence should be addressed
E-mail: dupingwu@ustc.edu.cn; ccsm@ustc.edu.cn

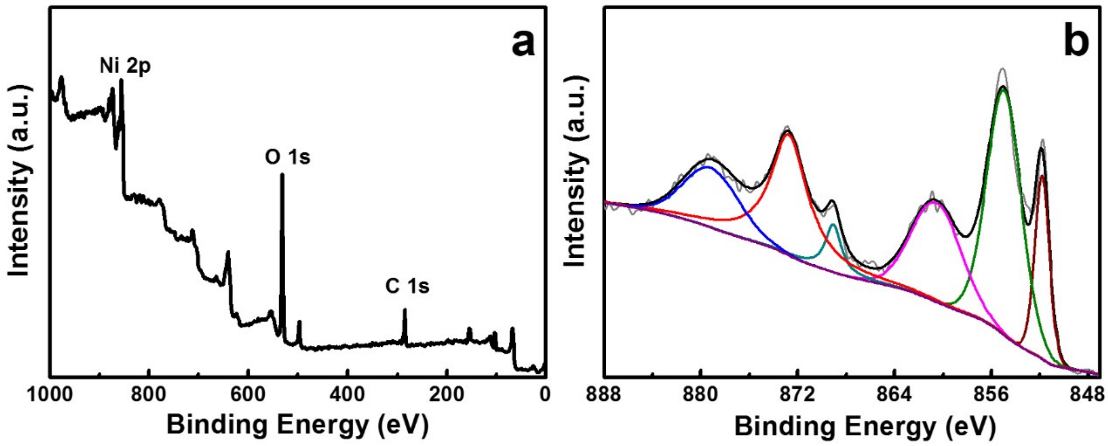

Figure S1. (a) XPS survey spectrum for NP. (b) Ni 2p character.

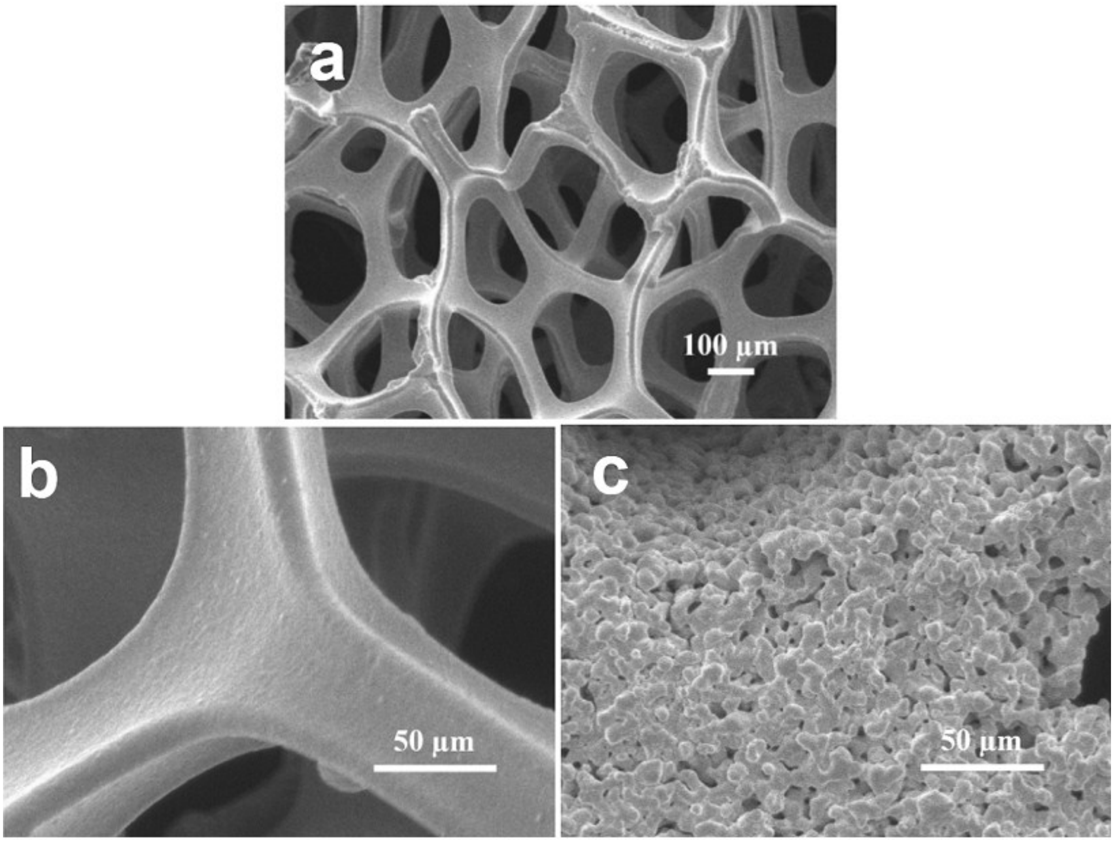

Figure S2. SEM images of NF (a) and the pore walls for NF (b) and NP (c).

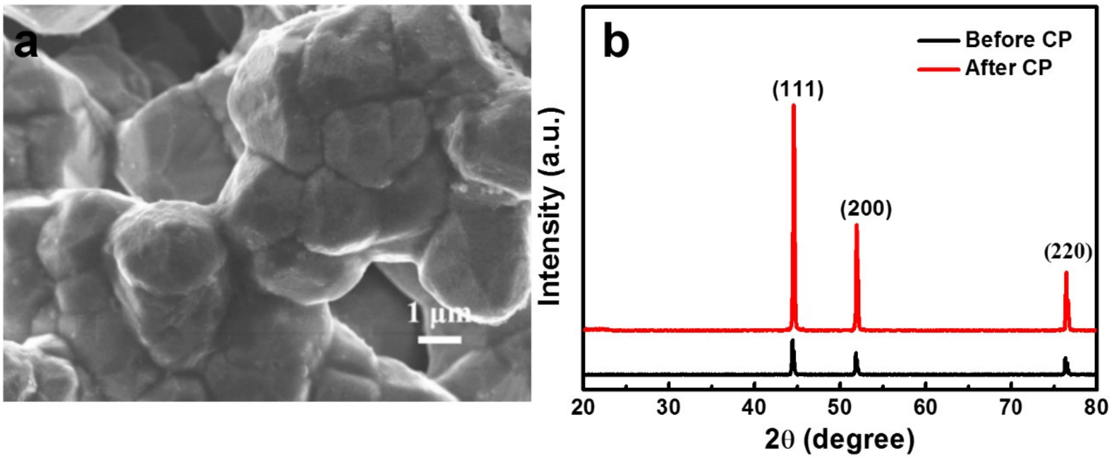

Figure S3. (a) SEM image of NP after Chronopotentiometric (CP) electrolysis for OER. (b) XRD patterns of NP before and after CP electrolysis for OER.

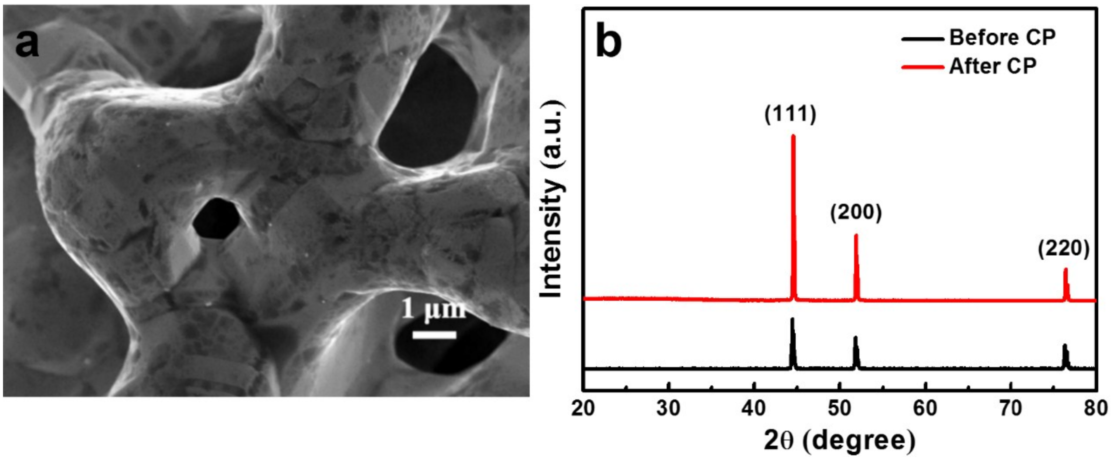

Figure S4. (a) SEM image of NP after Chronopotentiometric (CP) electrolysis for HER. (b) XRD patterns of NP before and after CP electrolysis for HER.

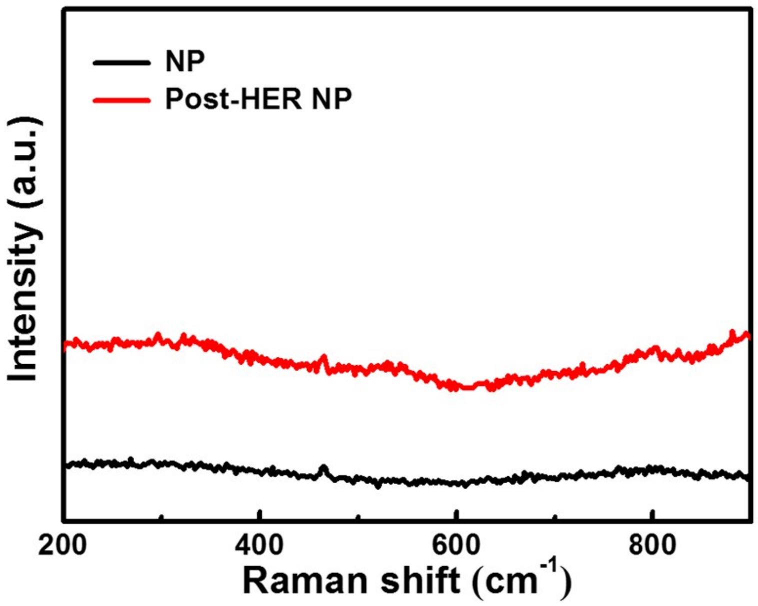

Figure S5. Raman spectra for NP and NP after Chronopotentiometric (CP) electrolysis for HER in 1.0 M KOH.

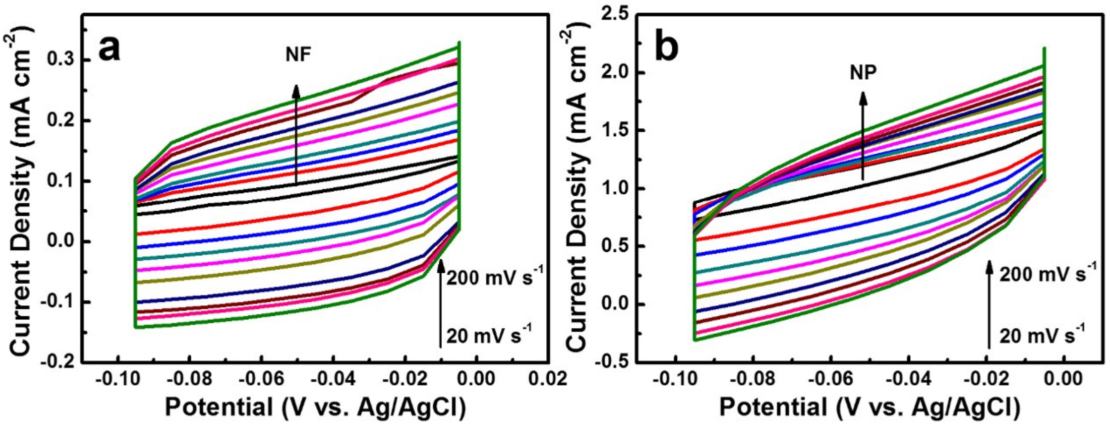

Figure S6. Cyclic voltammetry curves of NP (a) and NF (b) in the region of -0.1-0 V vs. Ag/AgCl at various scan rates (20, 40, 60 mV s^{-1}, etc.).

Table S1. Kinetic parameters of hydrogen evolution reaction of NP and NF. Exchange current density (j_0) were calculated from Tafel plots using extrapolation method.

Catalytic electrodes	**b (mV dec^{-1})**	**j_0 (μA cm^{-2})**
NF	90	51
NP	81	347