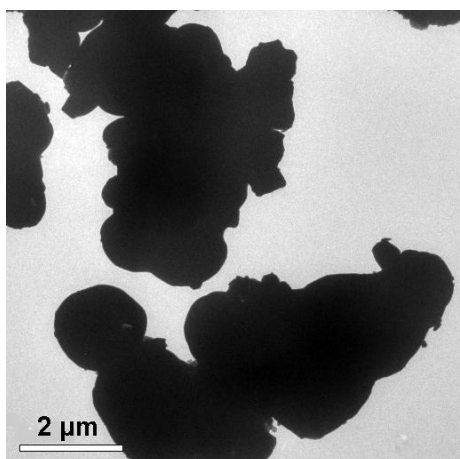


## **Supporting Information.**

### **Nanoporous Molybdenum Carbide Nanowire as an Advanced Electrocatalyst for the Hydrogen Evolution Reaction**

Lei Liao,<sup>a,b</sup> Sinong Wang,<sup>a</sup> Jingjing Xiao,<sup>a</sup> Xiaojun Bian,<sup>a</sup> Yahong Zhang,<sup>a</sup> Micheál D. Scanlon,<sup>b</sup> Xile Hu,<sup>c</sup> Yi Tang,<sup>a</sup> Baohong Liu,<sup>a</sup> Hubert H. Girault<sup>b</sup>

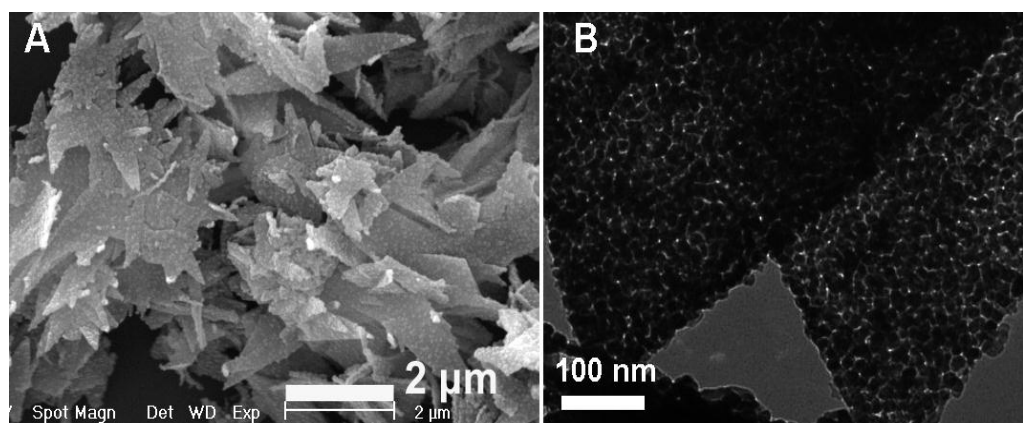
<sup>a</sup>Department of Chemistry, State Key Lab of Molecular Engineering of Polymers and Laboratory of Molecular Catalysis and Innovative Materials, Fudan University, Shanghai 200433, P. R. China; <sup>b</sup>Laboratoire d'Electrochimie Physique et Analytique, Ecole Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland; <sup>c</sup>Laboratory of Inorganic Synthesis and Catalysis, Ecole Polytechnique Fédérale de Lausanne, CH-1015 Lausanne, Switzerland.



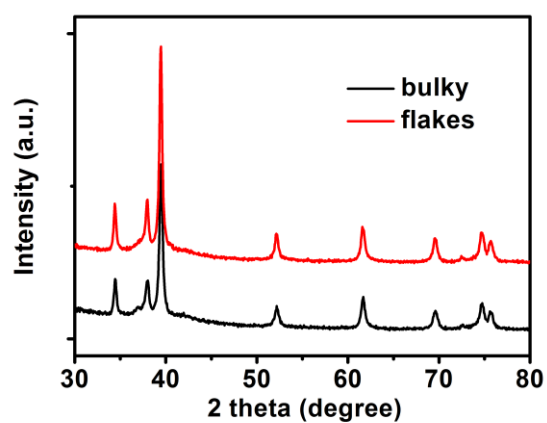
**Figure S1.** TEM image of commercial Mo<sub>2</sub>C sample.



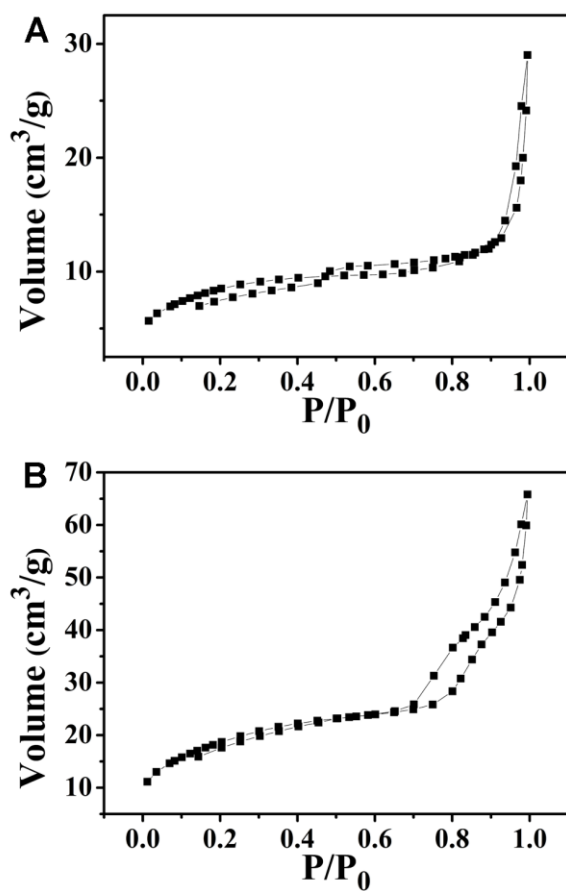
**Figure S2.** SEM image of bulky Mo<sub>2</sub>C foams.



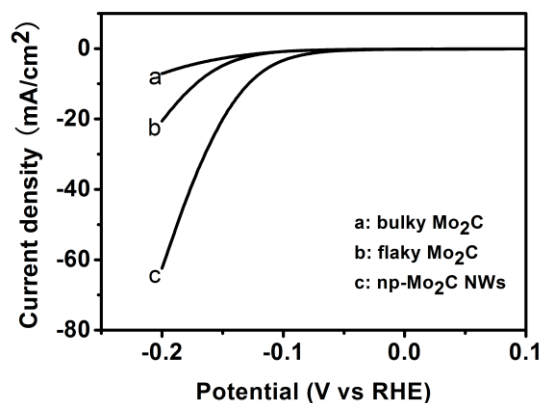
**Figure S3.** SEM (A) and TEM (B) images of Mo<sub>2</sub>C flakes.



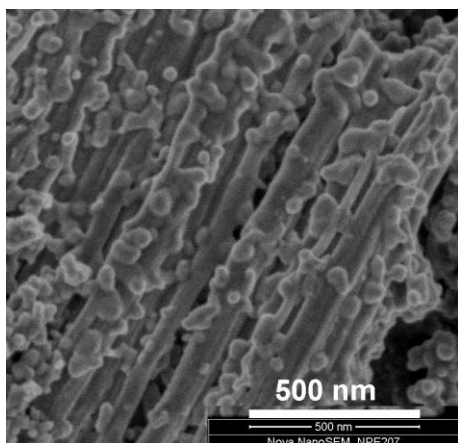
**Figure S4.** XRD patterns of bulky Mo<sub>2</sub>C and Mo<sub>2</sub>C flakes.



**Figure S5.** Nitrogen adsorption/desorption isotherm of bulky Mo<sub>2</sub>C (A) and Mo<sub>2</sub>C flakes (B).

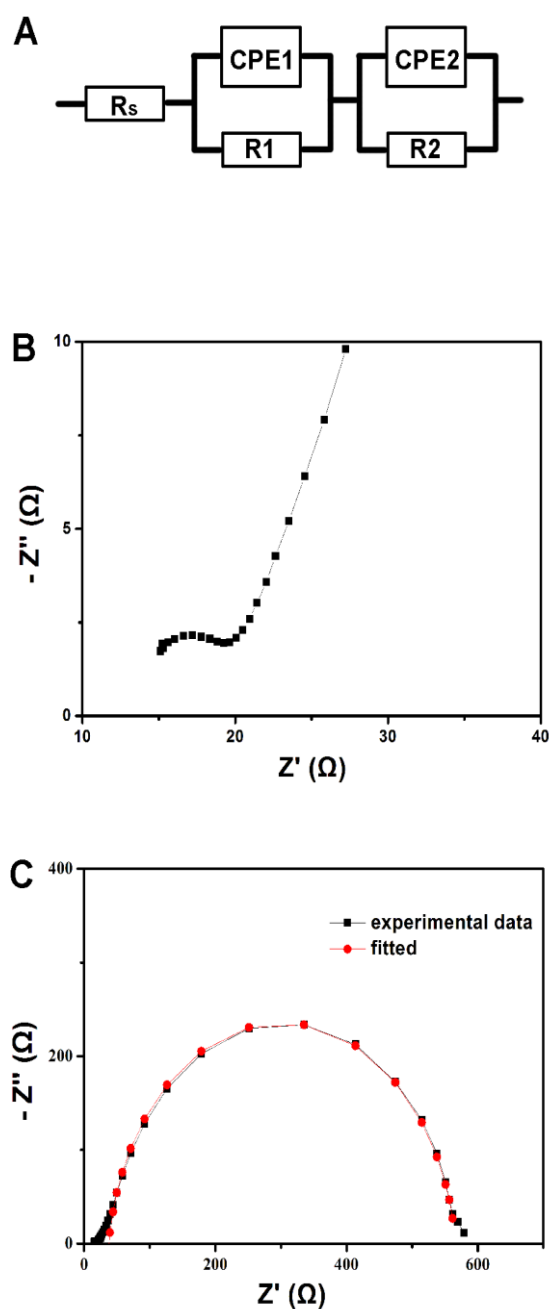


**Figure S6.** Polarization curves obtained from glassy carbon electrodes modified with np-Mo<sub>2</sub>C NWs, bulky Mo<sub>2</sub>C and flaky Mo<sub>2</sub>C. Each electrode was modified with the same amount of catalysts.

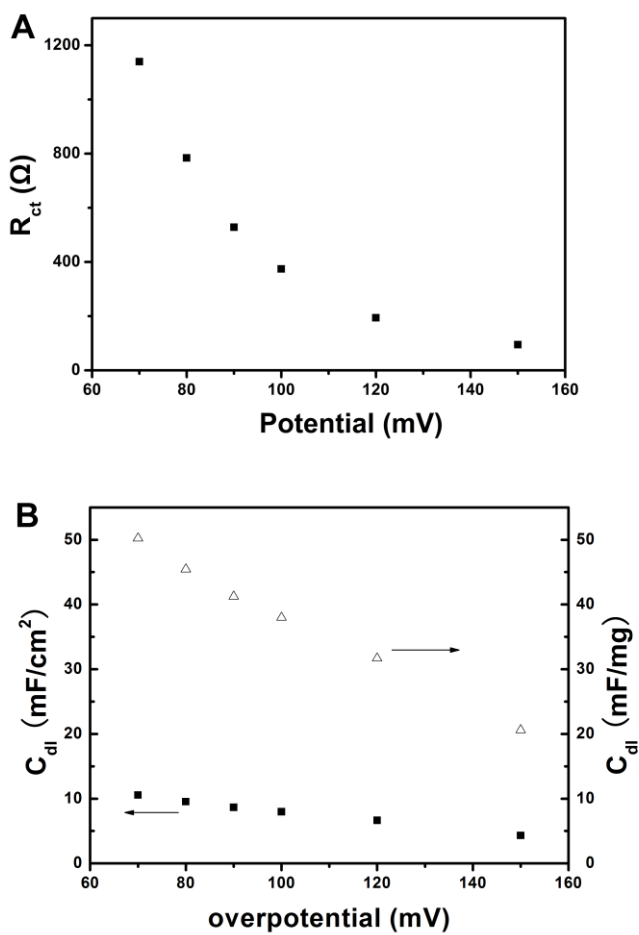


**Figure S7.** SEM image of np-Mo<sub>2</sub>C NWs mixed with Vulcan carbon (w/w 1:1).

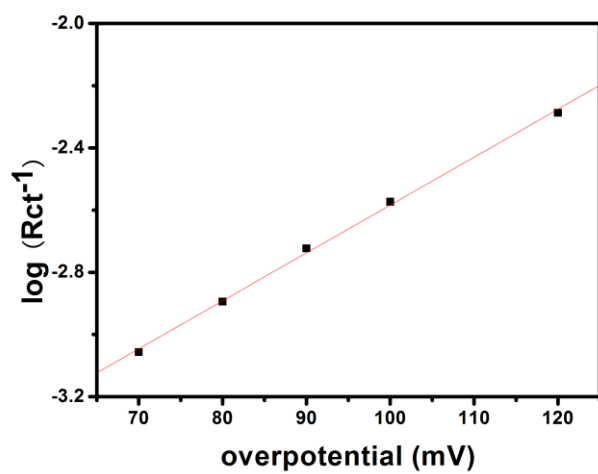




**Figure S8.** (A) Equivalent electrical circuit used to model the HER process on np-Mo<sub>2</sub>C NWs-modified GCE at various overpotentials. (B-C) Nyquist plots of np-Mo<sub>2</sub>C NWs-modified GCE at  $\eta = 90$  mV. The square symbols are experimental data and line with the circle dots is modeled by (A).



**Figure S9.** The low-frequency charge transfer resistance  $R_{ct}$  (A) and constant phase element (B) as a function of the HER overpotentials for np-Mo<sub>2</sub>C NWs-modified GCE in 0.5 M H<sub>2</sub>SO<sub>4</sub>.



**Figure S10.** Plots of  $\log (R_{ct}^{-1})$  vs. overpotential for np-Mo<sub>2</sub>C NWs.