Supporting Information

Hydrogen evolution of MoS_2/AOCF electrocatalyst doped with Ni element

Tingxian Tao, Xiaohan Lu, Mingxing Qin, Liru Chen, Wei Gao, Siyu Lu, and Zhichuan Wu*

Anhui Laboratory of Functional Coordinated Complexes for Materials Chemistry and Application,

Anhui Polytechnic University, Beijing Middle Road, Wuhu 241000, China.

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Synthesis of AOCF: 5 g polyacrylonitrile fiber (PAN) was added to a mixed solution of hydroxylamine hydrochloride and sodium carbonate prepared in a certain proportion, stirred in a water bath at 65 °C for 2 hours, then washing with DI water to pH=7, and finally dried naturally to obtain amidoxime fiber (AOCF).

Synthesis of MoS_2: $Na_2MoO_4{\cdot}2H_2O$ (0.242 g) and CH_3CSNH_2 (0.751 g) were intermittently dissolved in 30 mL DMSO. After being stirring for 2 hours to form homogeneous solution, the mixture was transferred into the Teflon-lined autoclave of 40 mL, and heated at 180 °C for 13 h. The resultant product was collected by centrifugation, washed with DI water and anhydrous ethanol several times. Finally, the obtained sample was dried 12 hours for 65 °C.

Synthesis of Ni@MoS_2: $Na_2MoO_4{\cdot}2H_2O$ (0.242 g), CH_3CSNH_2 (0.751 g) and $NiCl_2{\bullet}6H_2O$ (0.012 g) were intermittently dissolved in 30 mL DMSO. After being stirring for 2 hours to form homogeneous solution, the mixture was transferred into the Teflon-lined autoclave of 40 mL, and heated at 180 °C for 13 h. The resultant product was collected by centrifugation, washed with DI water and anhydrous ethanol several times. Finally, the obtained sample was dried 12 hours for 65 °C.

Synthesis of MoS_2/AOCF: Firstly, AOCF (3 g) were added to dimethyl sulfoxide (DMSO) and stirred at 70 ℃ for 24 h and then rested at room temperature for 24 h. $Na_2MoO_4{\cdot}2H_2O$ (0.242 g) and CH_3CSNH_2 (0.751 g) were intermittently dissolved in 30 mL of the above solution. After being stirring for 2 hours to form homogeneous solution, the mixture was transferred into the Teflon-lined autoclave of 40 mL, and heated at 180 °C for 13 h.

Synthesis of MoS_2/PAN: Firstly, PAN (3 g) were added to dimethyl sulfoxide (DMSO) and stirred at 70 ℃ for 24 h and then rested at room temperature for 24 h. $Na_2MoO_4{\cdot}2H_2O$ (0.242 g) and CH_3CSNH_2 (0.751 g) were intermittently dissolved in 30 mL of the above solution. After being stirring for 2 hours to form homogeneous

solution, the mixture was transferred into the Teflon-lined autoclave of 40 mL, and heated at 180 °C for 13 h.

Synthesis of Ni@MoS_2/PAN: Firstly, PAN (3 g) were added to dimethyl sulfoxide (DMSO) and stirred at 70 ℃ for 24 h and then rested at room temperature for 24 h. $Na_2MoO_4 \cdot 2H_2O$ (0.242 g), CH_3CSNH_2 (0.751 g) and $NiCl_2 \bullet 6H_2O$ (0.012 g) were intermittently dissolved in 30 mL of the above solution. After being stirring for 2 hours to form homogeneous solution, the mixture was transferred into the Teflon-lined autoclave of 40 mL, and heated at 180 °C for 13 h.

Table S1. Comparison of the electrocatalytic HER performance of MoS_2-based electrocatalysts in acidic solution.

Catalysts	η_{10} (mV)	Tafel slope (mV/dec)	C_{dl} (mF/cm^2)	Ref.
Ni@MoS_2/AOCF	173	54.80	58.97	This work
Pt-MoS_2	151	96	-	1
Al-MoS_2	248	82	19.1	2
Zn@MoS_{2-x}	194	73	2.07	3
g–C_3N_4/30%FeS_2/MoS_2	193	87.7	20.9	4
Defective MoS_2 nanoflakes	214	52	10.8	5
N-C@P-MoS_2	188	68	8.31	6
MCM@MoS_2–Ni	161	81	4.8	7
MoS_2 -polymer carbon nanodot	290	80	43.5	8
V-MoS_2	146	48	26.1	9
MoS_2@RGO/MMT	233	53	9.83	10
MoS_2-cPAN	185	68	-	11

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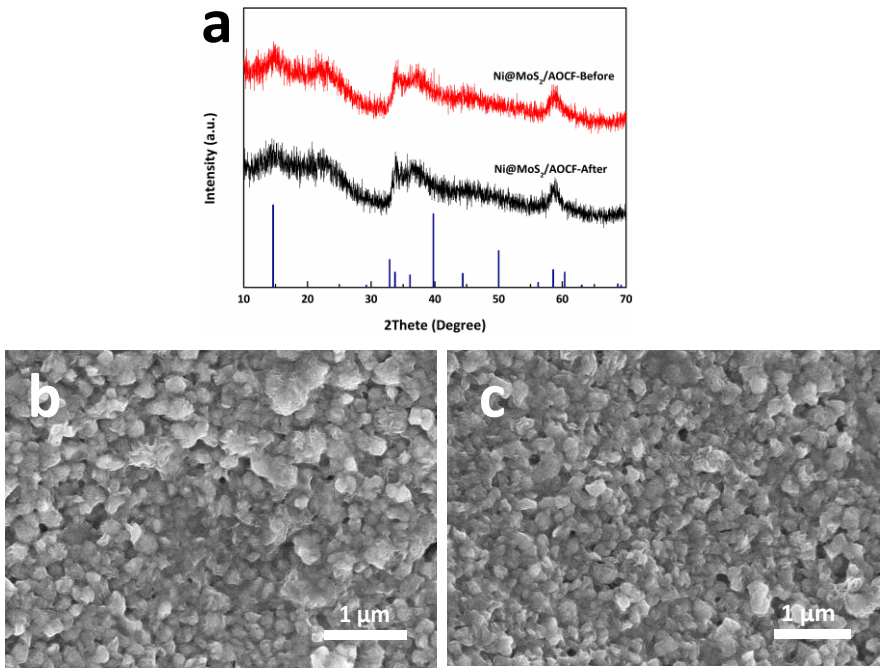

Figure S1. (a)XRD patterns of Ni@MoS_2/AOCF before and after Chronopotentiometry test under a current density of 10 mA/cm^2 for 36000s; SEM images of Ni@MoS_2/AOCF before (b) and after (c) Chronopotentiometry test under a current density of 10 mA/cm^2 for 36000s.

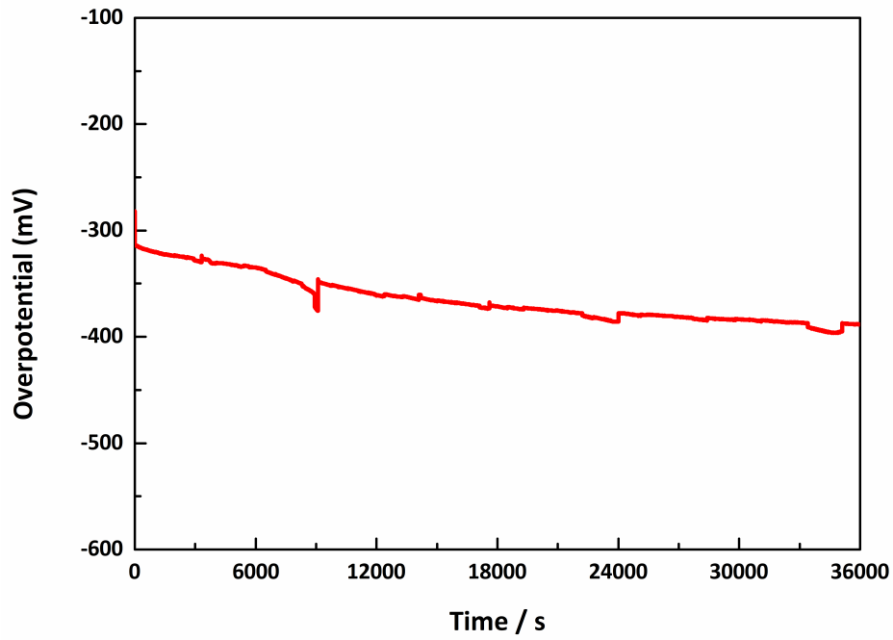

Figure S2. Chronopotentiometry test of Ni@MoS_2/PAN under a current density of 10 mA/cm^2 for 36000s;

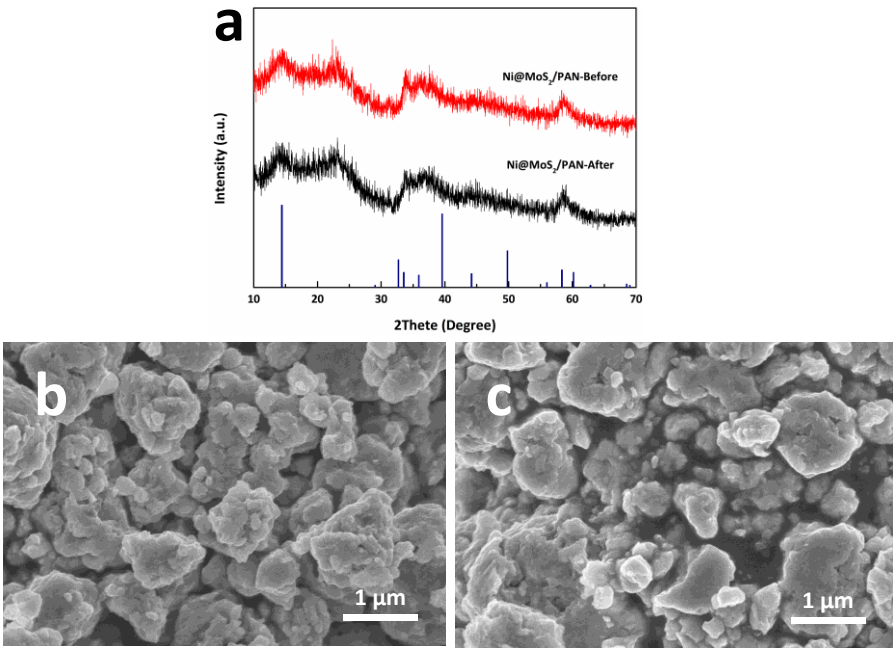

Figure S3. (a)XRD patterns of Ni@MoS_2/PAN before and after Chronopotentiometry test under a current density of 10 mA/cm^2 for 36000s; SEM images of Ni@MoS_2/PAN before (b) and after (c) Chronopotentiometry test under a current density of 10 mA/cm^2 for 36000s.