Carbon Nanotube Supported Molybdenum Carbide as Robust Electrocatalyst for Efficient Hydrogen Evolution Reaction

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Table S1 Comparison of the catalytic performance for HER between carbon supported molybdenum carbide of this work and reported recently

Catalyst	η_{10} (mV)	Tafel slope (mV dec^{-1})	CV cycles for stability test	CV potential range for stability test (V)	Electrolyte	Reference
Mo_2C/N-CNTs	137	50	20000	-0.3~0.3	0.5M H_2SO_4	This work
	145	47	10000	-0.3~0.3	1M KOH	
Mo_2C/CNT-RGO	145	64	1000	-0.3~0.2	0.5M H_2SO_4	1
N-Mo_xC@C HSs	172	60	\	\	0.5M H_2SO_4	2
Co/Mo_2C@N-CNTs	170	92	1000	\	1M KOH	3
Mo_2C/CNTs	255	103	1000	\	0.5M H_2SO_4	4
MoC_x/N-CNTs	136	56	3000	-0.4~0	0.5M H_2SO_4	5
N,P-Mo_xC/NF	107	65	1000	-0.2~0.2	0.5M H_2SO_4	6
	135	57	1000	\	1M KOH	
Mo_2C/CNTs	110	51	1000	\	0.5M H_2SO_4	7
Mo_2N -Mo_2C/HGr	157	55	2000	\	0.5M H_2SO_4	8
	154	68	2000	\	1M KOH	
Mo_2C@N-DC/G	107	66	1000	0.17~0.27	0.5M H_2SO_4	9
Mo_2C/Carbon cloth	72	53	5000	-0.3~0	1M KOH	10
Mo_2C/CNTs	112	54	1000	\	0.5M H_2SO_4	11

Mo_2C/CNT-RGO	200	67	\	\	0.5M H_2SO_4	12
Mo_2C/NC	152	58	\	\	0.5M H_2SO_4	13
	135	56	1000	-0.6~0	1M KOH	
Mo_2C/N-CNTs	195	75	1000	\	0.5M H_2SO_4	14
Mo_2C/B,N-C	184	68	3000	\	0.5M H_2SO_4	15
	145	57	3000	\	1M KOH	
Mo_2C/NC	187		1000	\	0.5M H_2SO_4	16
	116	48	1000	\	1M KOH	
N,P-Mo_2C/C	103	57	2000	-0.4~0.05	0.5M H_2SO_4	17
	80	46	\	\	1M KOH	

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Table 1 e Comparison of the catalytic activity for HER between NP-Mo_2C/PCMS-2-36-750 and other biomass-derived carbon/Mo_2C and several Mo_2C-based catalysts reported recently.

The calibration of SCE reference electrode was tested in a standard three-electrode system with two polished Pt electrodes and our SCE as the working, counter electrodes and reference electrode, respectively. Electrolytes were pre-purged high purity hydrogen to form a saturated solution of hydrogen. Then, linear scanning voltammetry (LSV) was performed at a scan rate of 0.1 mV/s. The potential at the current of zero was considered as the thermodynamic potential (vs. SCE) and was found to be -0.262 V and -1.04 V in 0.5 M H_2SO_4 and 1 M KOH solution, respectively.

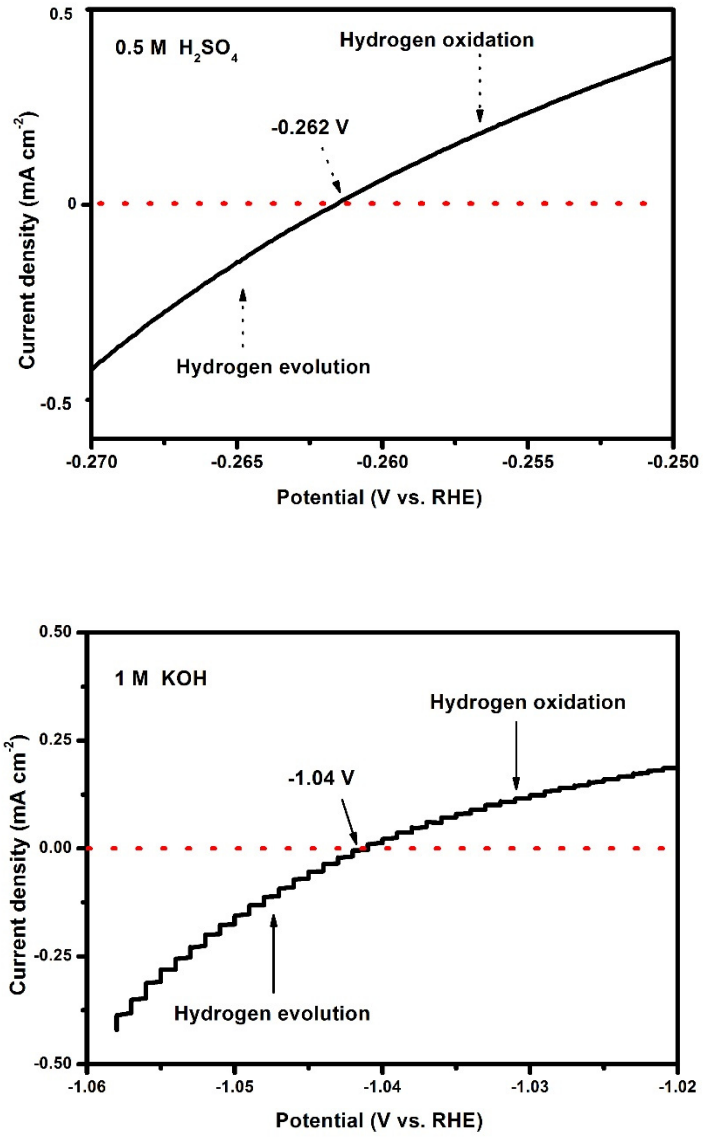


Figure S1 Calibration of SCE vs RHE.

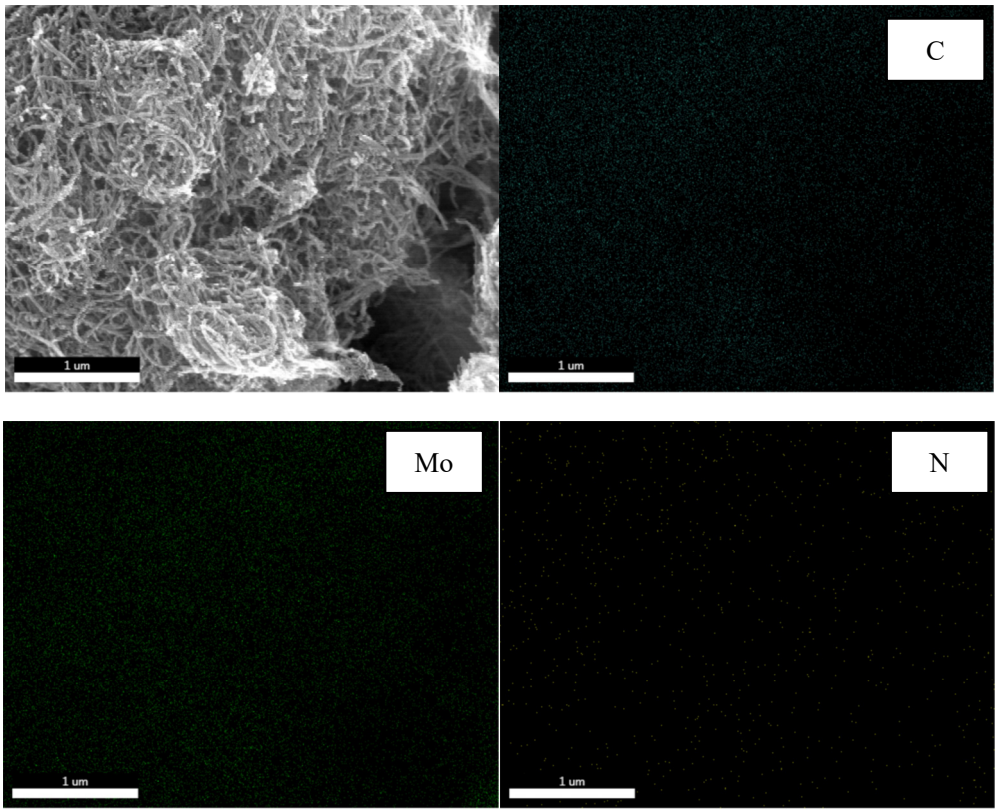
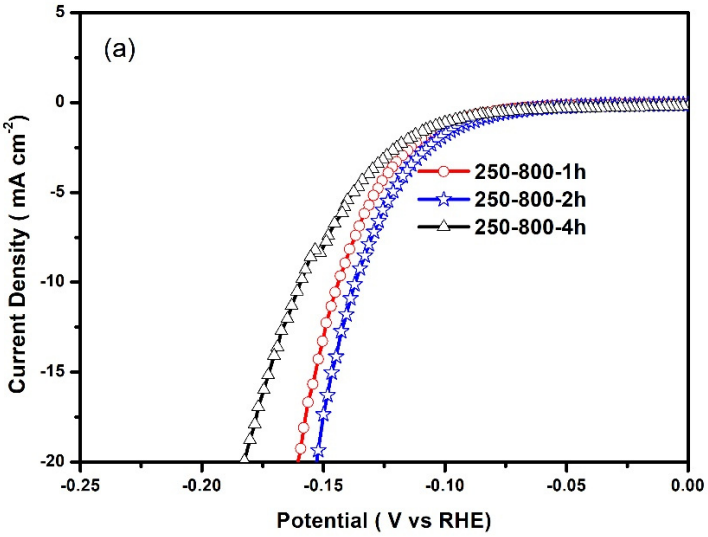


Figure S2 SEM image and corresponding elemental distributions.



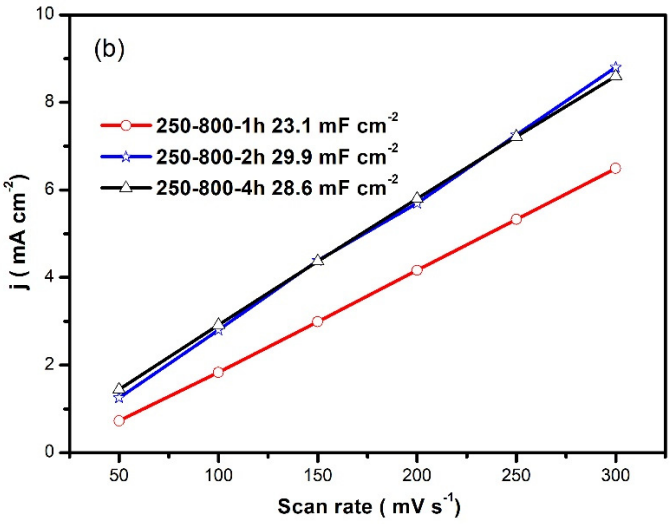


Figure S3 (a) polarization curves and (b) capacitive plots at 0.15 V of catalysts in 0.5 M H_2SO_4 solution.

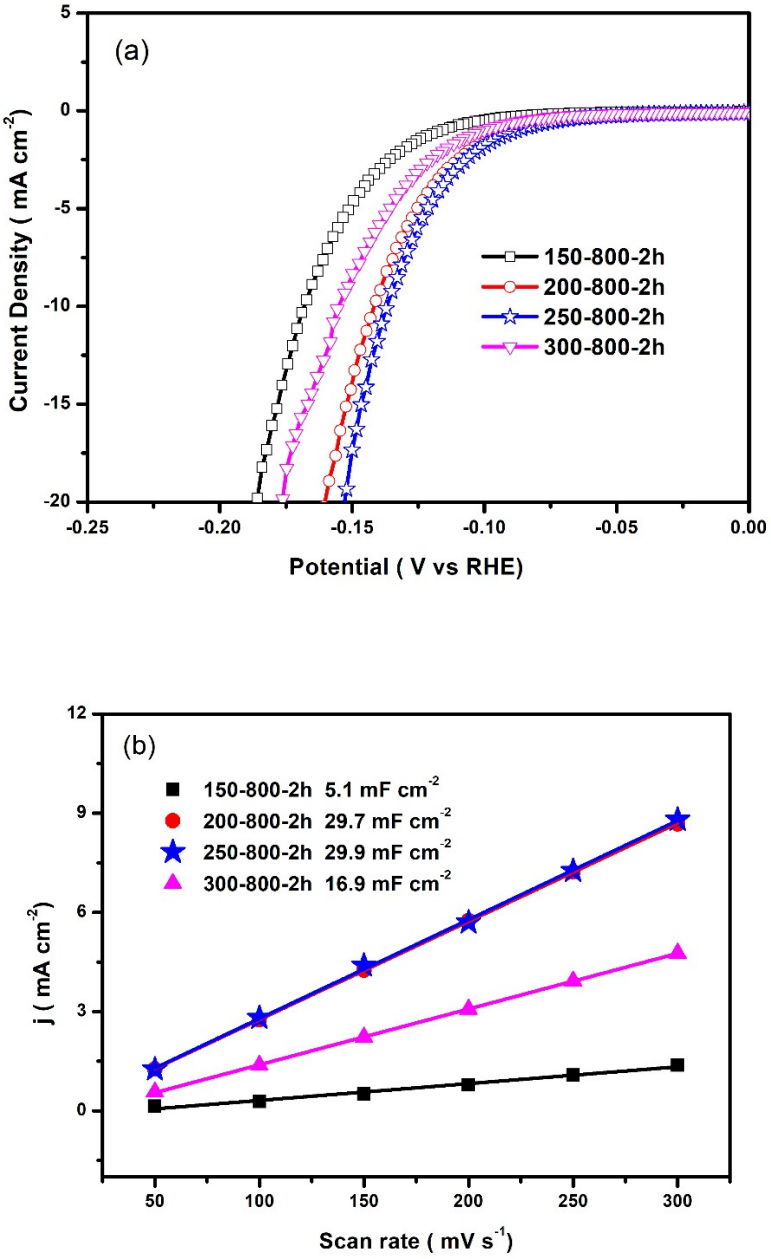


Figure S4 (a) polarization curves and (b) capacitive plots at 0.15 V of catalysts in 0.5 M H_2SO_4 solution.

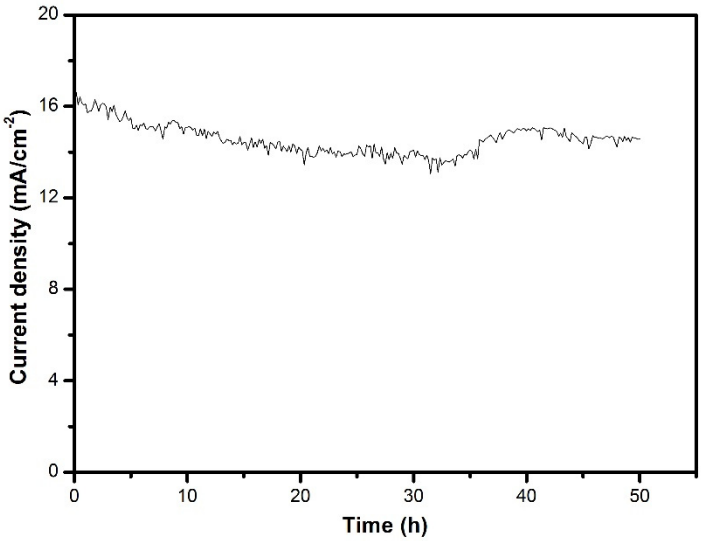


Figure S5 Time dependence of current density over 250-800-2h catalyst during HER at -0.15 V in 0.5 M H_2SO_4 solution