Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supporting Information

Carbon impurities-free, novel Mn, N co-doped porous Mo_2C nanorods for efficient and stable hydrogen evolution reaction

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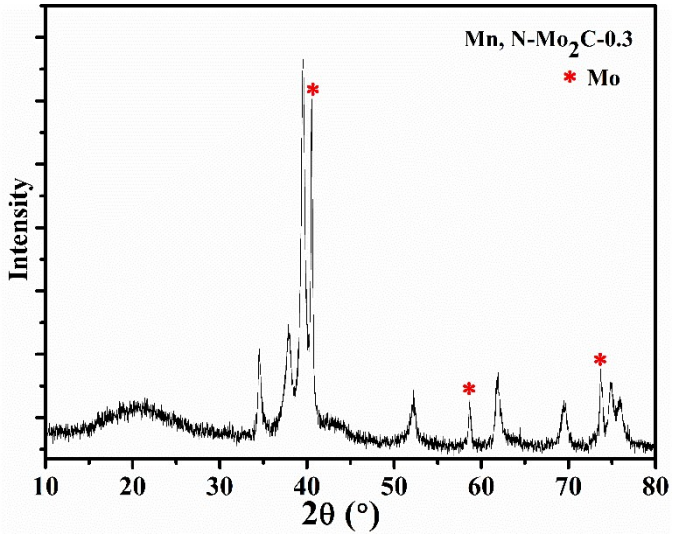

Fig. S1 XRD pattern of Mn, N-Mo_2C-0.3.

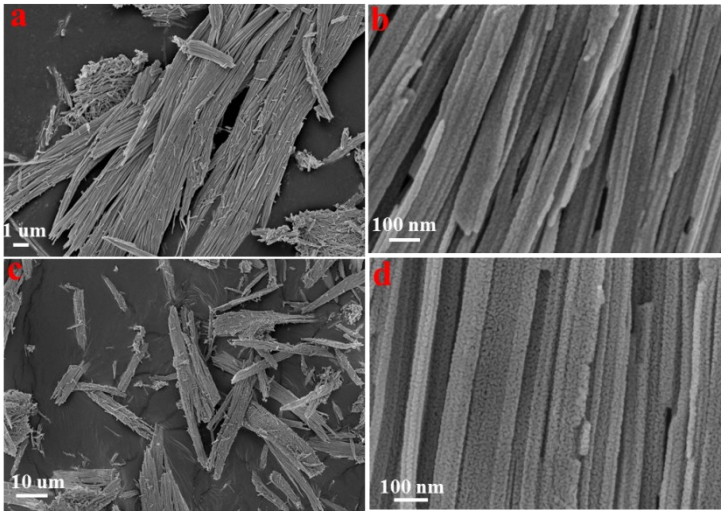

Fig. S2 SEM images of Mn, N-Mo_2C-0 (a-b) and Mn, N-Mo_2C-0.01 (c-d).

Tab. S1 Mn contents of Mn, N-doped Mo_2C electrocatalysts measured by ICP-OES.

Sample	Mn wt%
Mn, N-Mo_2C-0	0
Mn, N-Mo_2C-0.001	0
Mn, N-Mo_2C-0.005	0.38
Mn, N-Mo_2C-0.01	0.77
Mn, N-Mo_2C-0.05	3.3

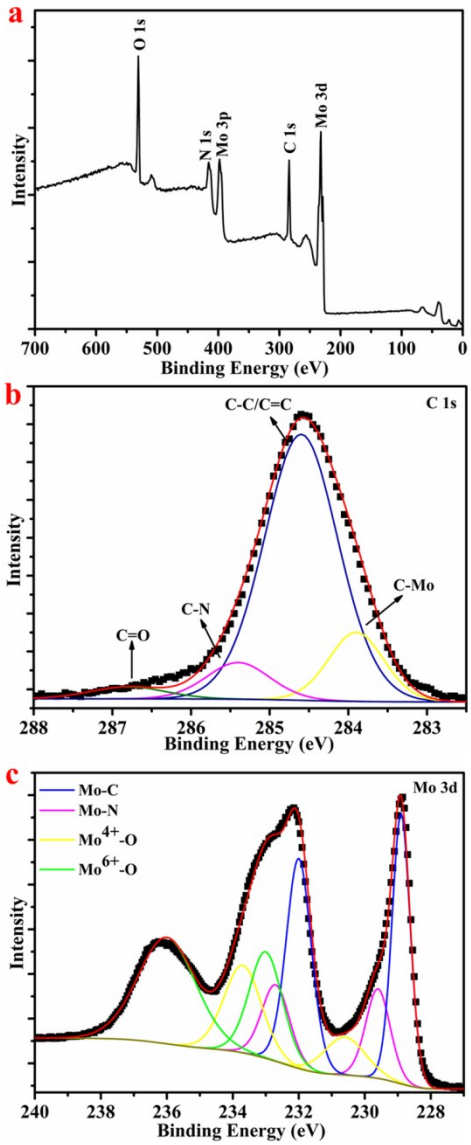

Fig. S3 (a) XPS survey spectrum, (b) C 1s, and (c) Mo 3d high-resolution XPS spectra of Mn, N-Mo_2C-0.

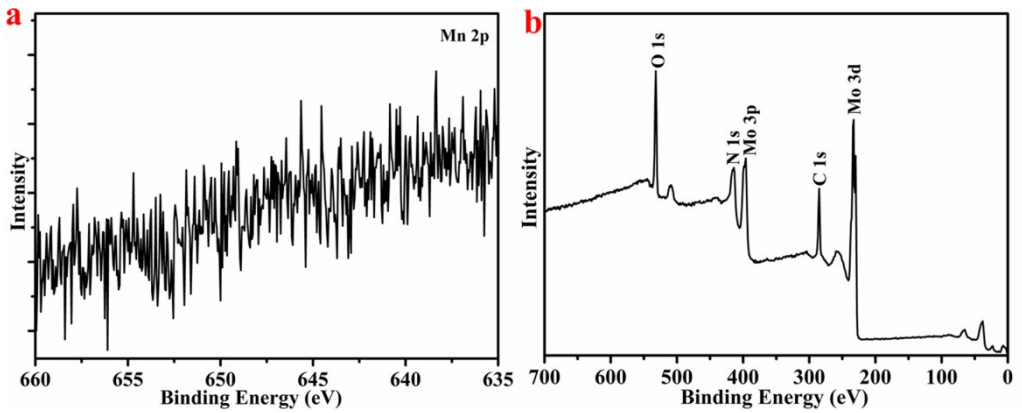

Fig. S4 (a) Mn 2p high-resolution and (b) XPS survey spectra of Mn, N-Mo_2C-0.01.

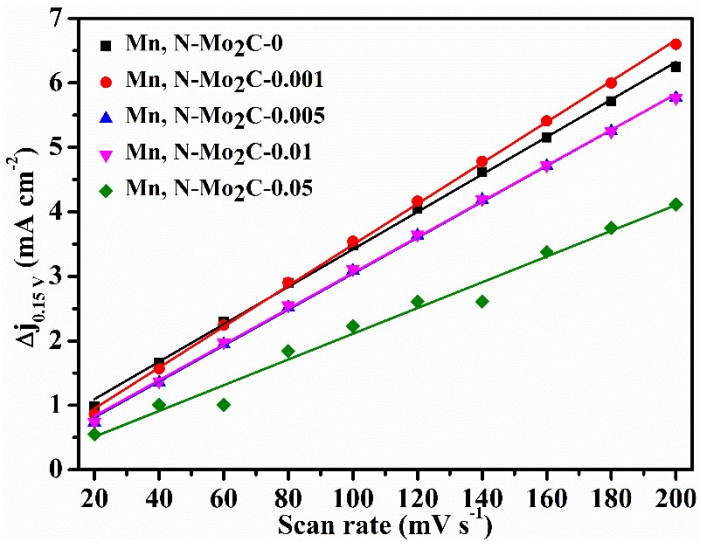

Fig. S5 Capacitive current at 0.15 V as a function of scan rate for Mn, N-doped Mo_2C electrocatalysts ($\Delta j_0 = j_a - j_c$) in the potential range of 0-0.3 V, where no Faradaic process occured.

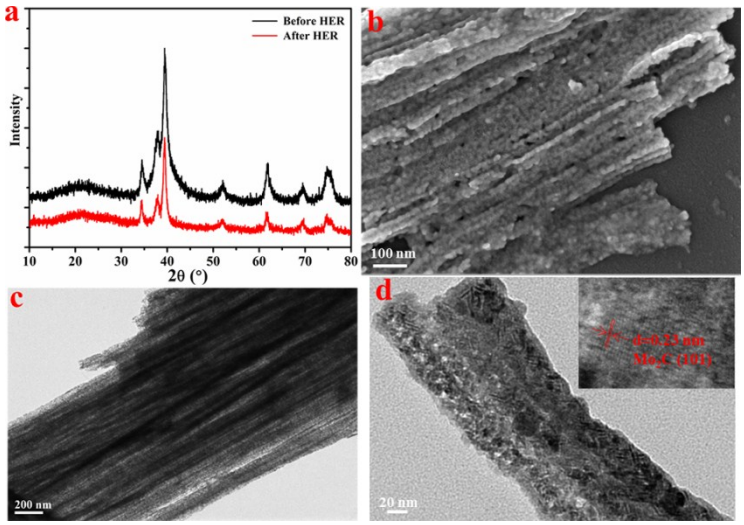

Fig. S6 (a) XRD patterns of Mn, N-Mo_2C-0.01 before and after HER test (1000 CV cycles). (b) SEM image, (c, d) TEM images for Mn, N-Mo_2C-0.01 after 1000 CV cycles. The inset in Fig, S6d is the HRTEM image of Mn, N-Mo_2C-0.01 after 1000 CV cycles.

Tab. S2 Comparison of the electrocatalytic activity of Mn, N-Mo_2C-0.01 and other related electrocatalysts reported for HER in acid solution.

Catalyst	Loading density (mg cm^{-2})	Current density j (mA cm^{-2})	Overpotential at the corresponding j (mV)	Tafel slope (mV dec^{-1})	Reference
Mn, N-Mo_2C-0.01	~0.55	10	163	66	This work
Mo_2N-Mo_2C/ HGr-3	~0.337	10	157	55	*Adv. Mater.* 2018, 30, 1704156
Mo_2C/CNT-GR	~0.65	10	130	58	*ACS Nano* 2014, 8, 5164
Mo-Mo_2C-0.077	~0.38	10	150	55	*J. Mater. Chem. A,* 2018, 6, 10028
Mo_2C-GNR	/	10	152	65	*ACS Nano* 2017, 11, 384
Co-Mo_2C-0.020	0.14	10	140	39	*Adv. Funct. Mater.* 2016, 26, 5590
Co-NC@Mo_2C	~0.83	10	143	60	Nano Energy 57, (2019), 746
Mo_2C@NC nanomesh	0.5	10	36	33.7	*Adv. Funct. Mater.* 2018, 28, 1705967
uf-Mo_2C/CF-2	0.25	10	184	71	Small Methods 2018, 1700396
Mo_2C/C (2:2)	0.28	10	180	71	*ACS Appl. Mater. Inter.,* 2017, 9, 41314