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Electronic Supplementary Information (ESI)

Nanoscale engineering and Mo-doping of 2D ultrathin ReS_2 nanosheets for remarkable electrocatalytic hydrogen generation

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Fig. S1. HRTEM image of the flat-lying 10%Mo-ReS_2 nanosheets.

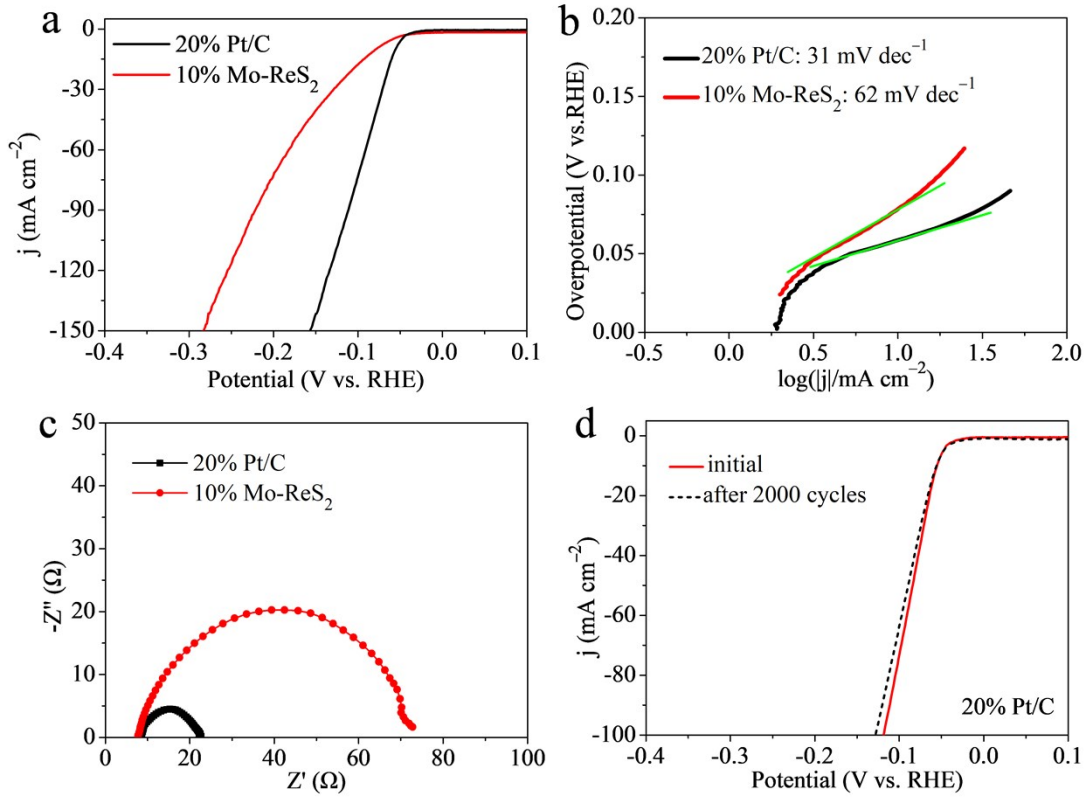

Fig. S2. (a-c) HER performance of the commercial 20%Pt/C and 10%Mo-ReS_2 catalysts. (d) LSV curves of the commercial 20%Pt/C catalyst before and after 2000 CV cycles.

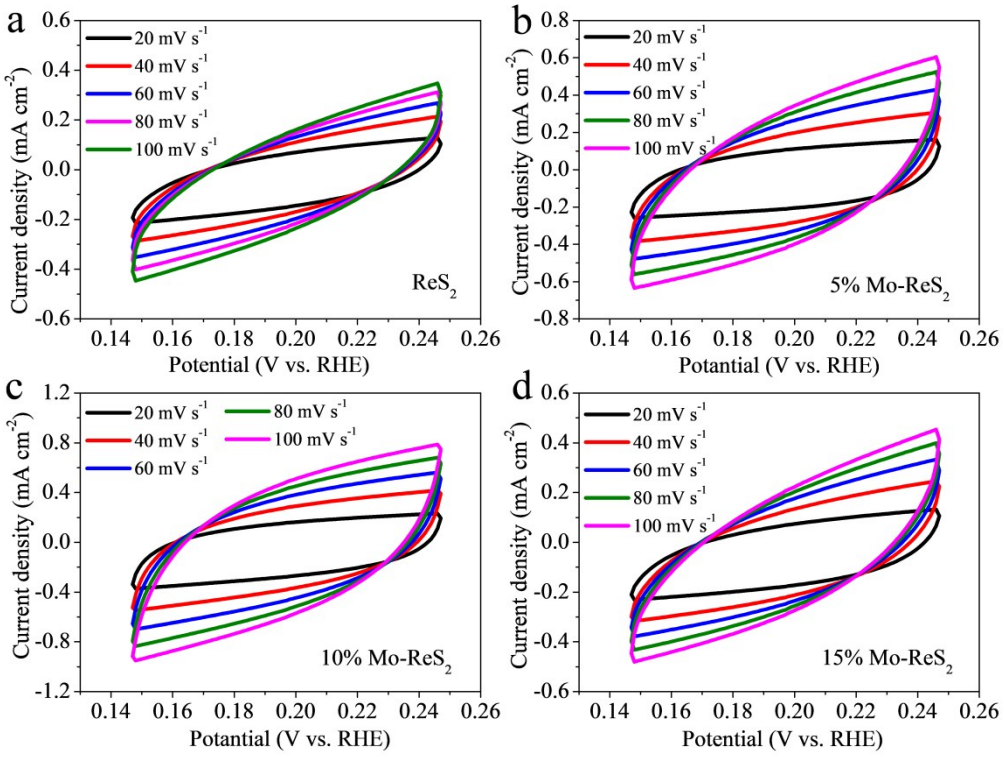

Fig. S3. CV curves of the various catalysts at different scan rates. (a) ReS_2, (b) 5% Mo-ReS_2, (c) 10% Mo-ReS_2, and (d) 15% Mo-ReS_2.

Table S1. Recent advance of ReS_2-based catalysts for electrocatalytic hydrogen evolution.

Catalysts	**η@ 10 mA cm^{-2}** (mV)	**Tafel slope** (mV dec^{-1})	**Electrolyte**	**Counter electrode**	**Stability**	**Reference**
10% Mo-ReS_2 nanospheres	81	62	0.5M H_2SO_4	graphite rod	50 h	This work
ReS_2 on 3D carbon foam	336	NA	0.5M H_2SO_4	Pt	NA	Electrochemistry Communications, 2016, 63, 39–43
as-exfoliated ReS_2 nanosheets	~300	75	0.5M H_2SO_4	Pt wire	NA	Nanoscale, 2014, 6, 12458–12462
Li-vertical ReS_2@Au	~195	84	0.5M H_2SO_4	Pt wire	NA	Nano Lett., 2016, 16, 3780−3787
Monolayer ReS_2 with Re vacancy (V_{Re}-ReS_2)	147	69	0.5M H_2SO_4	graphite carbon	NA	ACS Nano, 2018, 12, 4486−4493
ReSSe nanodots	84	50.1	0.5M H_2SO_4	graphite carbon	NA	J. Am. Chem. Soc., 2018, 140, 8563–8568
ReS_2 nanosheets on conductive carbon fiber cloth (ReS_2@CFC)	206	80	0.5M H_2SO_4	graphite rod	NA	Nano Energy, 2018, 48, 337–344
ReS_2@CFC under light illumination	167	77			2.8 h	
ReS_2 nanosheets on conductive carbon fiber paper (ReS_2@CFP)	236	146	0.5M H_2SO_4	Pt foil	NA	Nano Energy, 2018, 46, 305–313
ReS_2@CFP under light irradiation for 2h (ReS_2@CFP-L2h)	116	137			10h	

ReS_2/Si-30s under light illumination	NA	73.7	0.5M H_2SO_4	Pt wire	NA	Adv. Mater. Interfaces, 2018, 1801663
ReS_2/Ni_3S_2 p-n heterostructure on Ni foam under light illumination	106	111	1.0 M KOH	graphite rod	15 h	ACS Appl. Mater. Interfaces, 2019, 11, 40014-40021