Electronic Supplementary Material (ESI) for Catalysis Science & Technology.

Polysulfide Induced Synthesis of Mo doped NiS_x Based on Solid Nanoplate Arrays for Efficient Oxygen Evolution Catalysis

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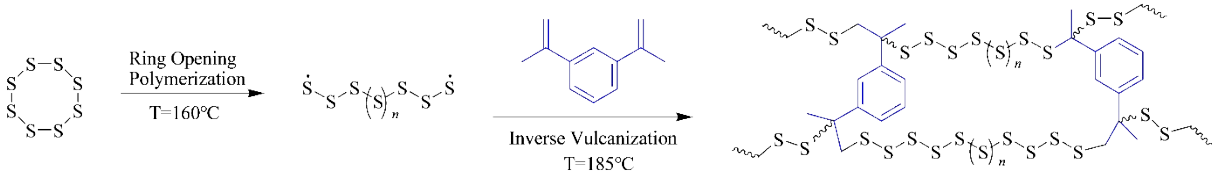

Scheme S1 Schematic for the synthesis process of poly(S-r-DIB).

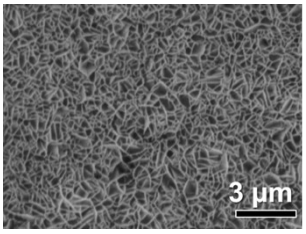

Figure S1 SEM image of $NiMoO_4$ on the surface of Ni foam.

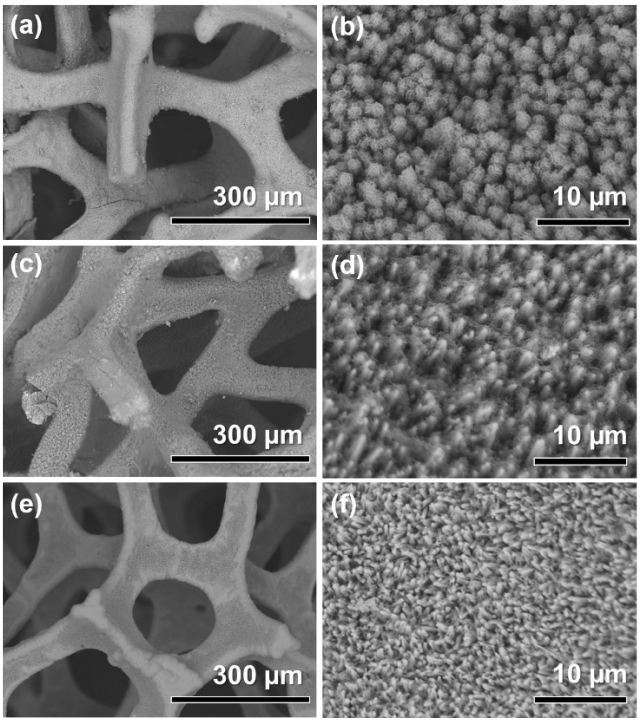

Figure S2 SEM images of (a) Mo-NiS_x-m /Ni, (b) Mo-NiS_x-s/Ni, (c) and (d) NiS_x-p/Ni.

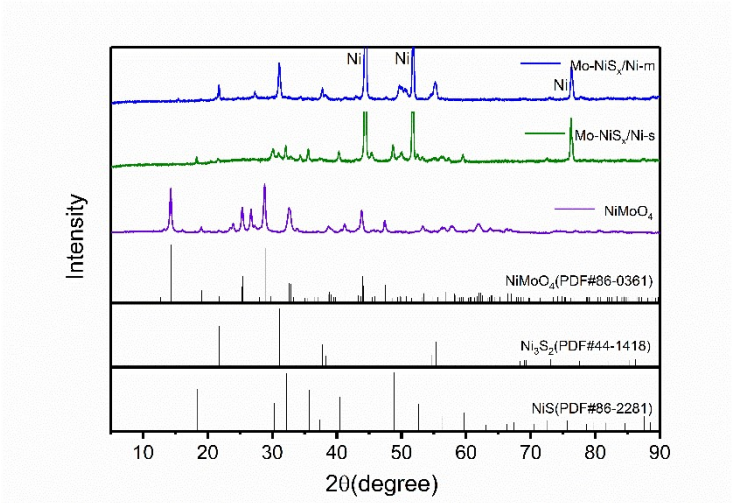

Figure S3 XRD patterns of Mo-NiS_x/Ni-m, Mo-NiS_x/Ni-s and $NiMoO_4$.

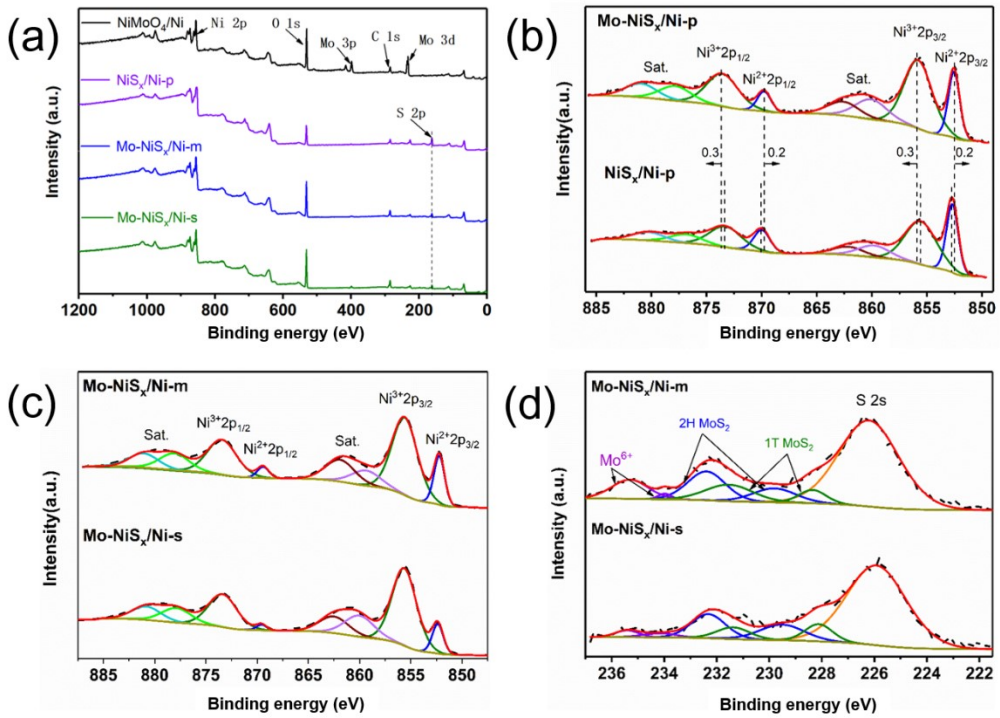

Figure S4 XPS full-spectrum survey for $MoNiO_4$/Ni, NiS_x/Ni-p, Mo-NiS_x/Ni-m and Mo-NiS_x/Ni-p. (b) The Ni 2p XPS spectra comparison of Mo-NiS_x/Ni-p and NiS_x/Ni-p. (c) The Ni 2p XPS spectra of Mo-NiS_x/Ni-s and NiS_x/Ni-m. (d) The Mo 3d XPS spectra of Mo-NiS_x/Ni-s and NiS_x/Ni-m.

Table S1 Comparison of OER activity for as-prepared Mo-NiS_x-p/Ni with other Nickel-sulfur electrodes in alkaline solution.

Samples	η_{10} [mV]	η_{50} [mV]	η_{100} [mV]	Tafel Slope [mV dec^{-1}]	Reference
Mo doped nickel sulfide mixed crystal	--	184	240	38.74	This work
Cobalt–manganese sulfides grown on Ni foam	--	--	298	43.9	1
Mo-Doped Ni_3S_2/Ni_xP_y on Ni foam	--	238	270	60.6	2
$MoS_2/Co_9S_8/Ni_3S_2$/Ni	166	--	--	58	3
NiS porous hollow microspheres	320	--	--	59	4
Millerite phase NiS	139	--	--	32	5
3D Structured Mo-doped Ni_3S_2 Nanosheets	260	--	--	85	6
Mulberry-like NiS/Ni nanoparticles	301	--	--	46	7
Porous $NiCo_2S_4$/FeOOH nanowire arrays	~200	--	--	71	8
Heterogeneous lamellar-edged Fe-$Ni(OH)_2/Ni_3S_2$ nanoarray	269	--	--	46	9
High-Index-Faceted Ni_3S_2 Branch Arrays	220	--	300	--	10
Cu-doped Ni3S2 nanosheet arrays on Ni foam	259			54.9	11

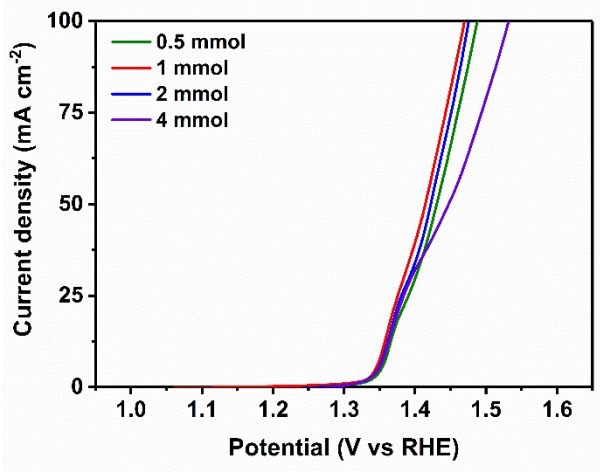

Figure S5 The polarization curves of Mo-NiS_x/Ni-p with different Mo content.

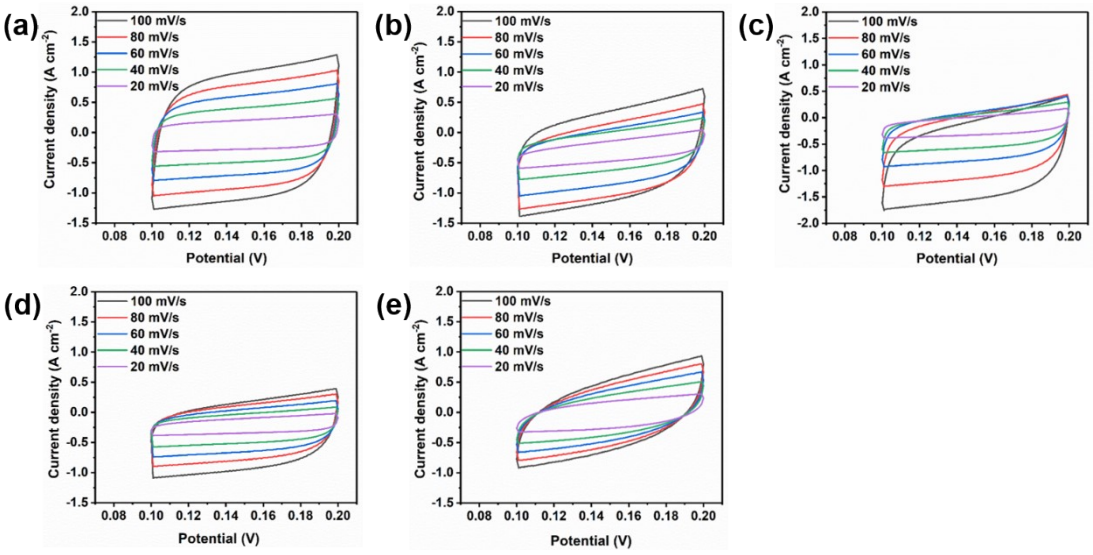

Figure S6 OER cyclic voltammetry at the scan rates of 20, 40, 60, 80 and 100 mV s-1 for ECSA of (a) Mo-NiS_x/Ni-p, (b) Mo-NiS_x/Ni-m, (c) Mo-NiS_x/Ni-s, (d) NiS_x/Ni-p and (e) $NiMoO_4$/Ni.

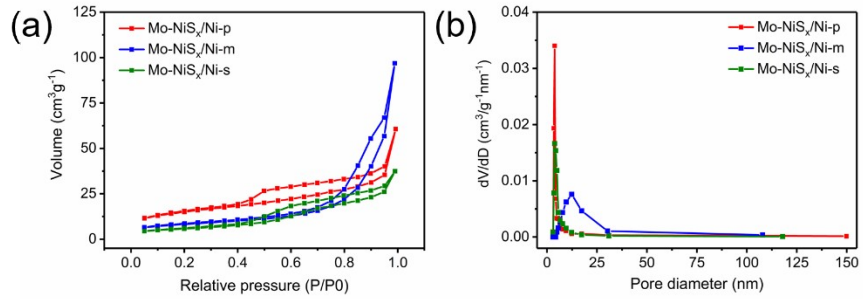

Figure S7 (a) N_2 adsorption/desorption isotherms and (b) the corresponding Barrett-Joyner-Halenda (BJH) pore-size distribution curve determined from the desorption branch of the isotherm for Mo-NiS_x/Ni-p, Mo-NiS_x/Ni-m and Mo-NiS_x/Ni-s.

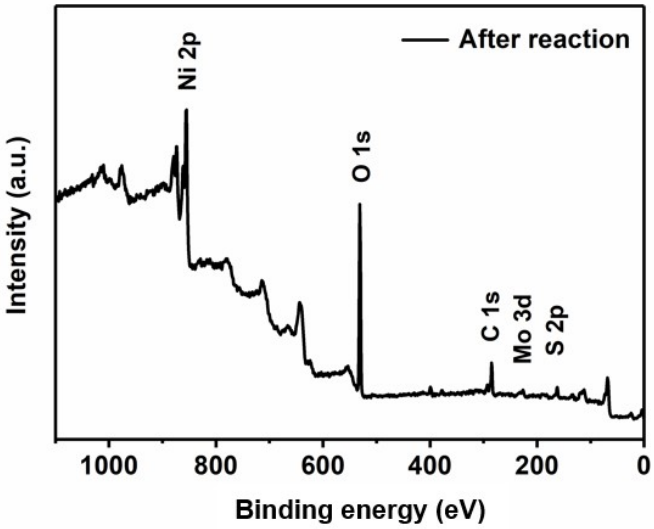

Figure S8 XPS full-spectrum survey for Mo-NiS_x/Ni-p after stability test.

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