Supporting information

Selenization of NiMn layered double hydroxide with enhanced electrocatalytic activity for oxygen evolution

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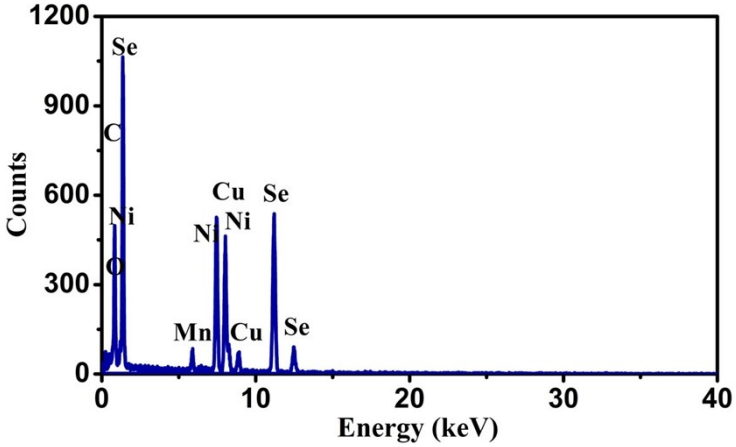

Fig. S1 The energy dispersive X-ray spectrum obtained from the selected square in the TEM image.

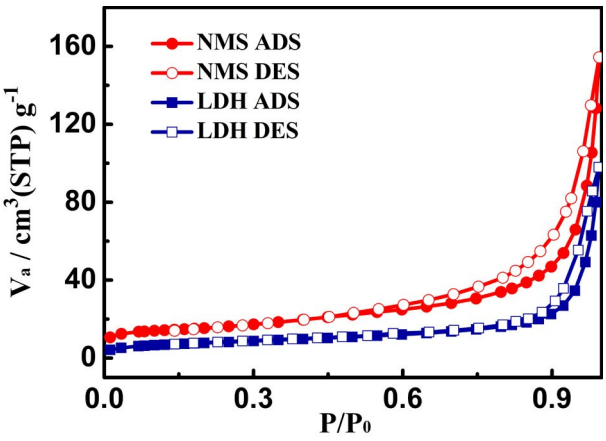

Fig. S2 N_2 adsorption and desorption curves of NiMn LDH and the selenization of NiMn LDH.

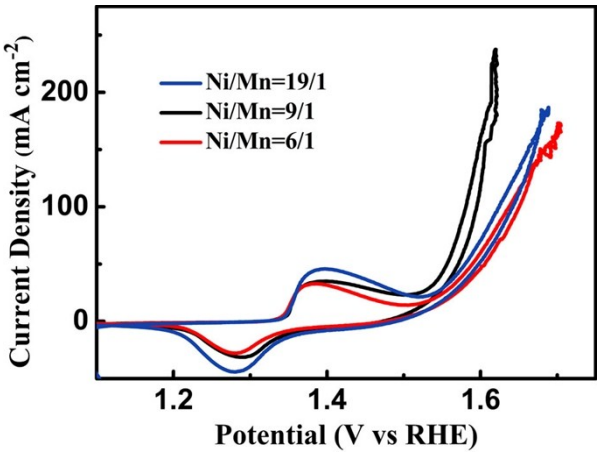

Fig. S3 The cyclic voltammetry (CV) curves of the catalysts with different Ni/Mn ratio.

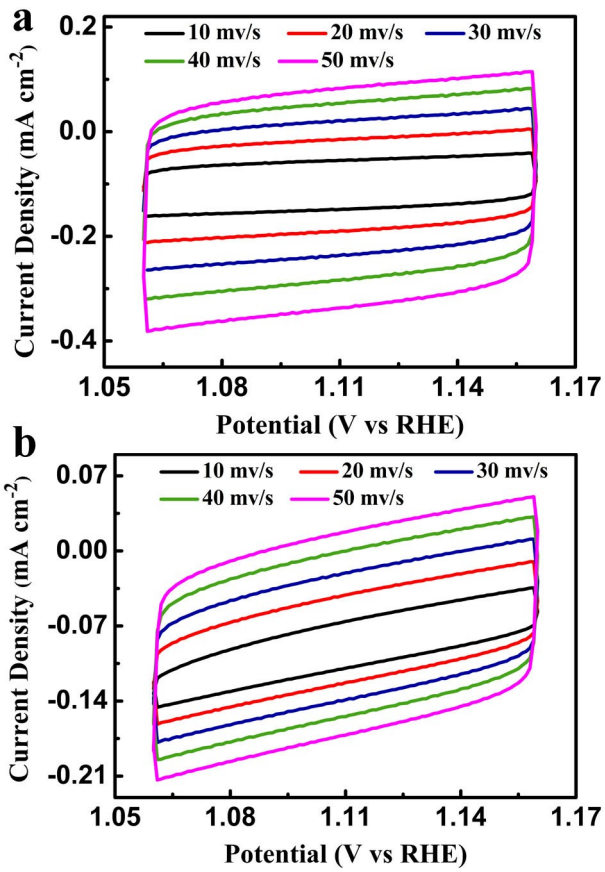

Fig. S4 Electrochemical double-layer capacitance measurements. The cyclic voltammograms (CVs) measurements with various scan rates for (a) NMS and (b) NiMn LDH in 1.0 M KOH.

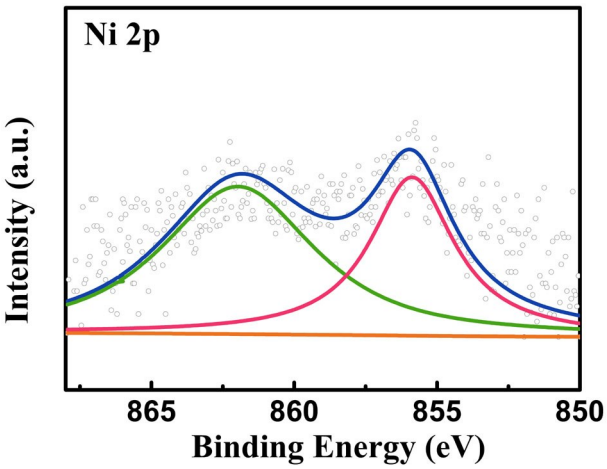

Fig. S5 Ni 2p spectra of NMS sample after OER measurements.

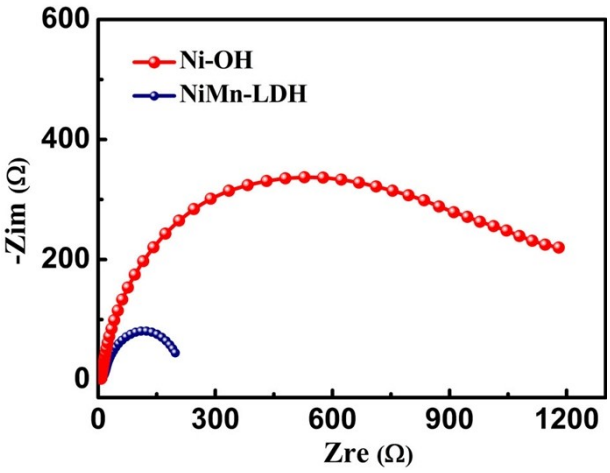

Fig. S6 Nyquist plots of $Ni(OH)_2$ and NiMnLDH.

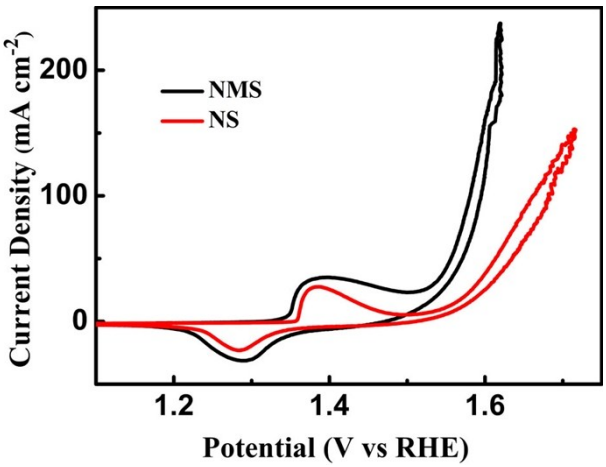

Fig. S7 CV curves of selenized NiMn LDH (NMS) and selenized $Ni(OH)_2$ (NS) in 1.0 M KOH at a potential sweep rate of 5 mV/s.

Table S1. Comparison of the OER activity of the NMS to that of nickel-based catalysts

coated on glassy carbon reported in the literature.

Catalysts	Electrolyte	J_{geo} (current density in mA cm^{-2} @ overpotential in mV)	Tafel slope (mV dec^{-1})	Substrate	Reference
$Ni_{1.12}Fe_{0.49}Se_2$	1 M KOH	10@η=227	37.9	GC	33
Ni_3FeN/N-G	1 M KOH	10@η=250	45	GC	34
NMS	**1 M KOH**	**10@η=280**	**71**	**GC**	**This work**
Ni_2P@C/G	1 M KOH	10@η=285	44	GC	35
$CoNi_2Se_4$	1 M KOH	10@η=300	53	GC	18
Ni_3N/NC	1 M KOH	10@η=310	/	GC	36
rGO@$CoNiO_x$	1 M KOH	10@η=320	45	GC	37
$CoNi_{0.37}$-CN	1 M KOH	10@η=320	71	GC	38
$Ni_{0.9}Fe_{0.1}PS_3$	1 M KOH	20@η=329	69	GC	39
NiMn-LDH	1 M KOH	10@η=350	40	GC	15
Ni/Mo_2C-PC	1 M KOH	10@η=368	/	GC	40