

Supporting Information

Colloidal synthesis of urchin-like Fe doped NiSe₂ for efficient oxygen evolution

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Table S1 Composition of NiFeSe catalysts

Catalysts	1	2	3	4
Precursor ratio Ni:Fe:Se	NiFe _{0.23} Se ₂	NiFe _{0.53} Se ₂	NiFe _{0.75} Se ₂	NiFeSe ₂
ICP result	Ni _{1.16} Fe _{0.27} Se ₂	Ni _{1.12} Fe _{0.49} Se ₂	Ni _{1.06} Fe _{0.58} Se ₂	Ni _{1.02} Fe _{0.88} Se ₂

Table S2 Comparison of OER catalytic performances with reported metal selenides

Catalyst	electrolyte	support	loading (mg/cm ²)	J (mA/cm ²)	Overpotential (mV)	ref
Ni ₃ Se ₂	0.3 M KOH	GC	0.217	10	290	1
Co _{0.13} Ni _{0.87} Se ₂	1 M KOH	Ti	1.67	100	320	2
NiSe ₂	1 M KOH	Ti	2.5	20	295	3
NiSe ₂	1 M KOH	GC	1	10	250	4
FeNiSe	1 M KOH	FeNi foam	4.8	100	264	5
NiSe	1 M KOH	Ni foam	2.8	20	270	6
NiSe	1 M KOH	Ni foam		10	320	7
Ni ₃ Se ₂	1 M KOH	CF	3	50	340	8
Ni ₃ Se ₂	1 M KOH	Ni foam	8.87	20	242	9
(Ni, Co) _{0.85} Se	1 M KOH	carbon cloth	5	10	255	10
(Ni,Co) _{0.85} Se @ NiCo LDH	1 M KOH	carbon cloth	6	10	216	10
NiSe ₂	1 M KOH	Ni foam		50	350	11
Ni _{0.5} Fe _{0.5} Se ₂	1 M KOH	CFC		50	350	12
CoSe	1 M KOH	GC	0.28	10	295	13
Co ₇ Se ₈	1 M KOH	GC		10	290	14
NiCo-selenide	0.1 M KOH	CFP	0.2	10	393	15
CoSe	1 M KOH	Ti	3.8	10	292	16
CoSe	0.1 M KOH	NG	0.2	10	366	17
Co _{0.85} Se/NiFe-LDH	1 M KOH	EG		150	270	18
CoSe ₂	0.1 M KOH	GC	0.142	10	320	19

CoOx–CoSe	1 M KOH	Ni foam	1.7	100	300	20
CeO ₂ /CoSe ₂	0.1 M KOH	GC	0.2	10	288	21
Ni _{0.75} Fe _{0.25} Se ₂	1 M KOH	CFC	1.5	100	277	22
NixFe _{1-x} Se ₂ -DO	1 M KOH	Ni foam		10	195	23
Ni _{1.12} Fe _{0.49} Se ₂	1 M KOH	XC-72	0.45	10	227	this work

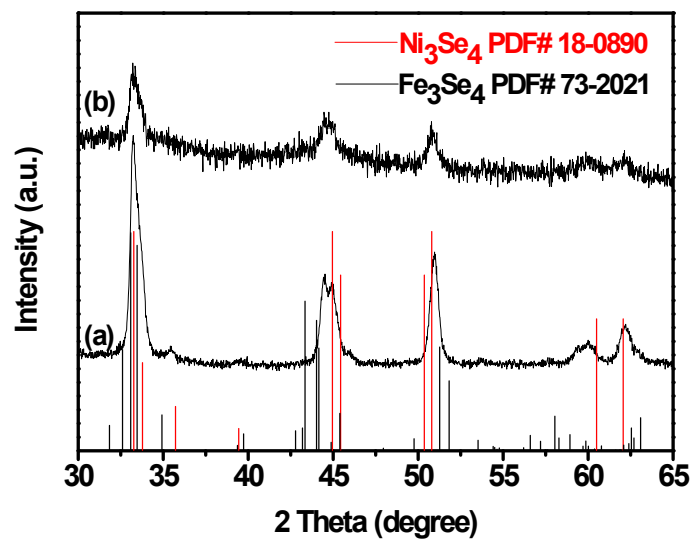


Figure S1. XRD patterns of Ni_{1.12}Fe_{0.49}Se₂ before (a) and after (b) OER stability test.

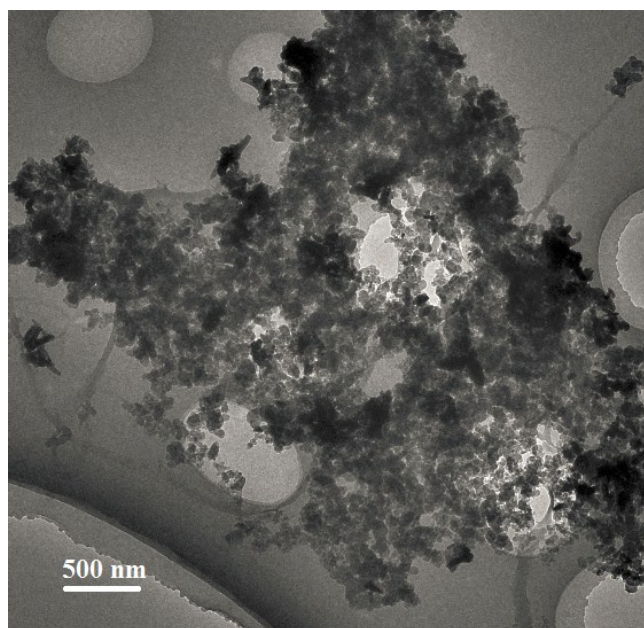


Figure S2. TEM image of Ni_{1.12}Fe_{0.49}Se₂/XC-72 after OER stability test.

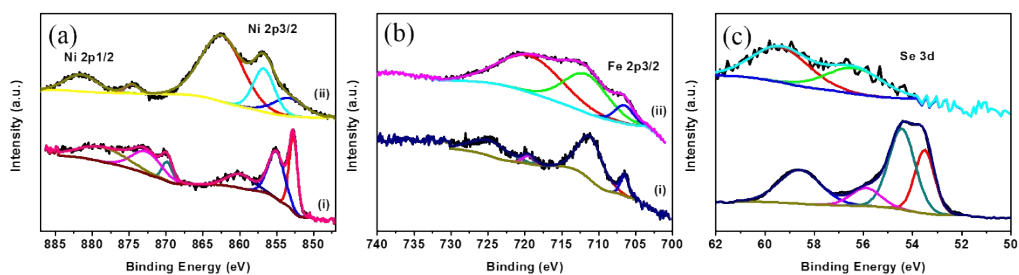


Figure S3. XPS spectra of Ni 2p (a), Fe 2p (b), Se 3d (c) in $\text{Ni}_{1.12}\text{Fe}_{0.49}\text{e}_2$ catalyst before (i) and after (ii) OER stability test.

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