Electronic Supplementary Information

Hierarchical Fe-Doped Ni_3Se_4 Ultrathin Nanosheets as an Efficient Electrocatalyst for Oxygen Evolution Reaction

Jing Du[a,b]*, Zehua Zou [a], Chen Liu,[c] and Cailing Xu[a]*

[a]State Key Laboratory of Applied Organic Chemistry, Laboratory of Special Function Materials and Structure Design of the Ministry of Education, College of Chemistry and Chemical Engineering, Lanzhou University, Lanzhou 730000, China

[b]Key Laboratory of Advanced Energy Materials Chemistry (Ministry of Education), Nankai University, Tianjin 300071, China

[c]School of Physical Science and Technology, Lanzhou University, Lanzhou 730000, China

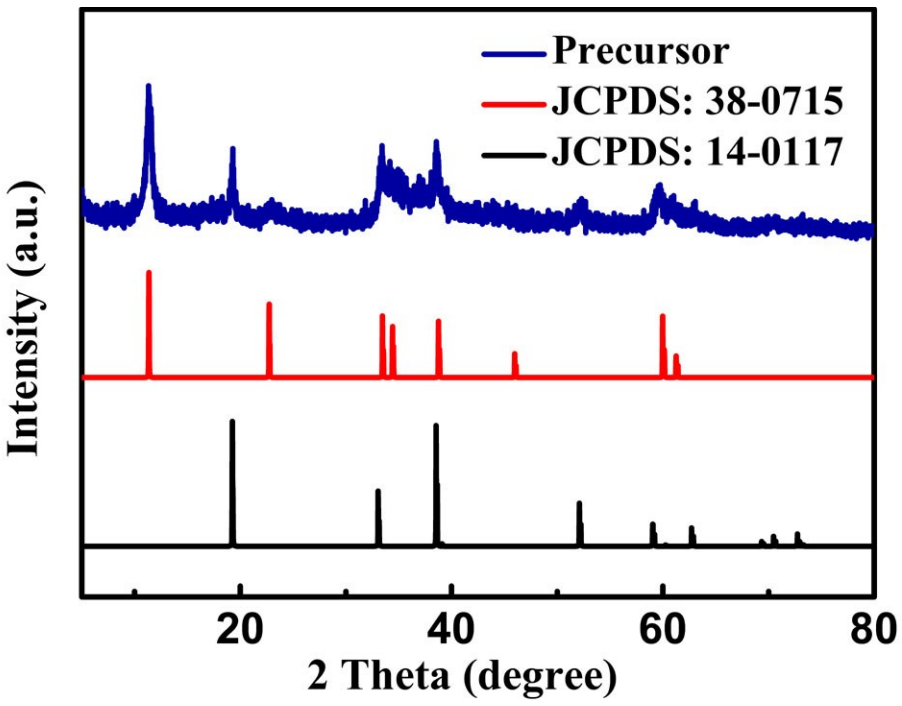

Fig. S1. XRD pattern of LDH precursor.

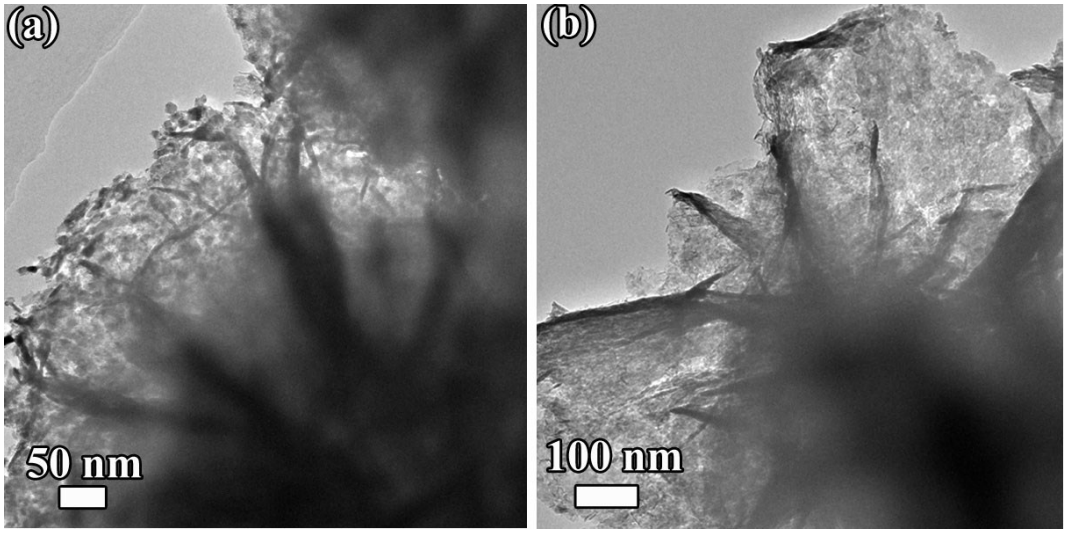

Fig. S2. (a) TEM image of Ni_3Se_4 nanosheets. (b) TEM image of $(Ni,Fe)_3Se_4$ nanosheets.

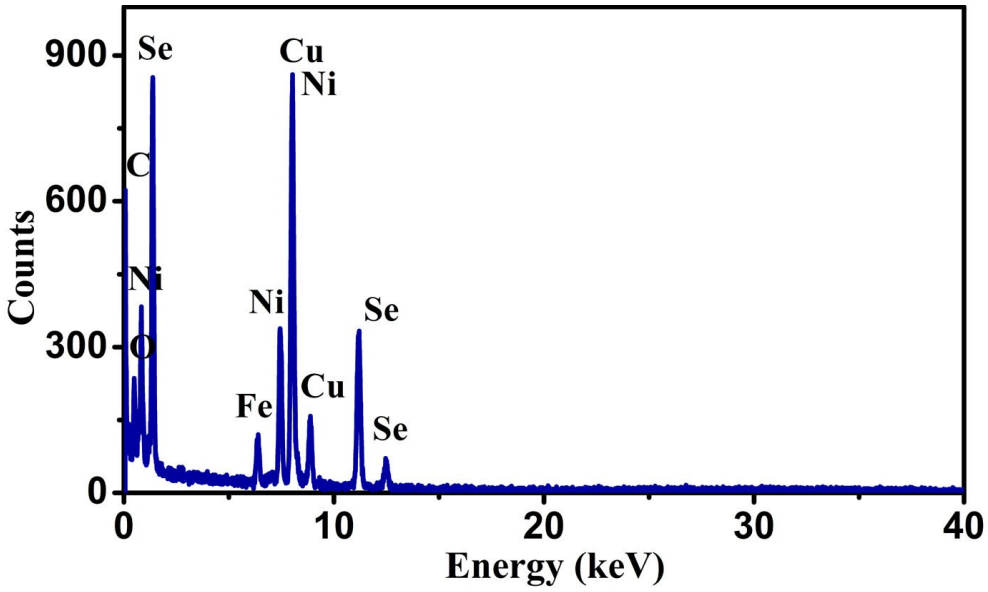

Fig. S3. The energy dispersive X-ray spectrum obtained from the selected square in the TEM image.

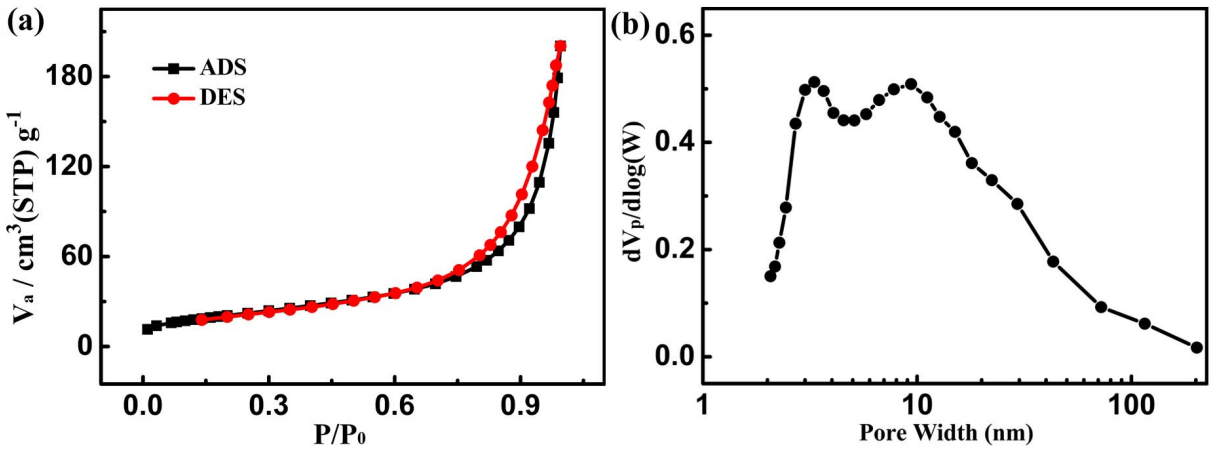

Fig. S4. (a) N_2 adsorption-desorption isotherms for $(Ni,Fe)_3Se_4$ nanosheets. (b) The characteristic BJH pore size distributions.

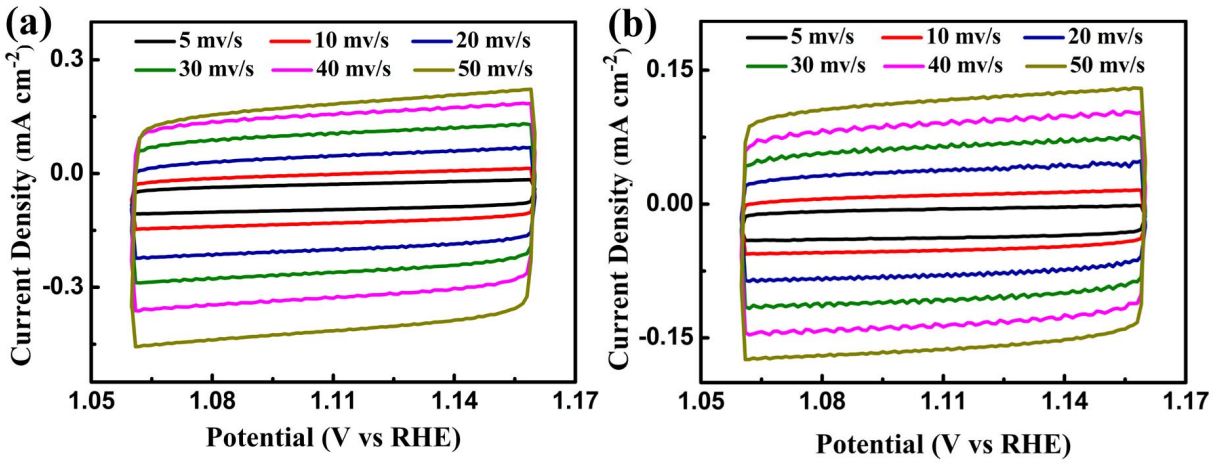

Fig. S5. Electrochemical double-layer capacitance measurements. The cyclic voltammograms (CVs) measurements with various scan rates for (a) $(Ni,Fe)_3Se_4$ and (b) Ni_3Se_4 nanosheets in 1.0 M KOH.

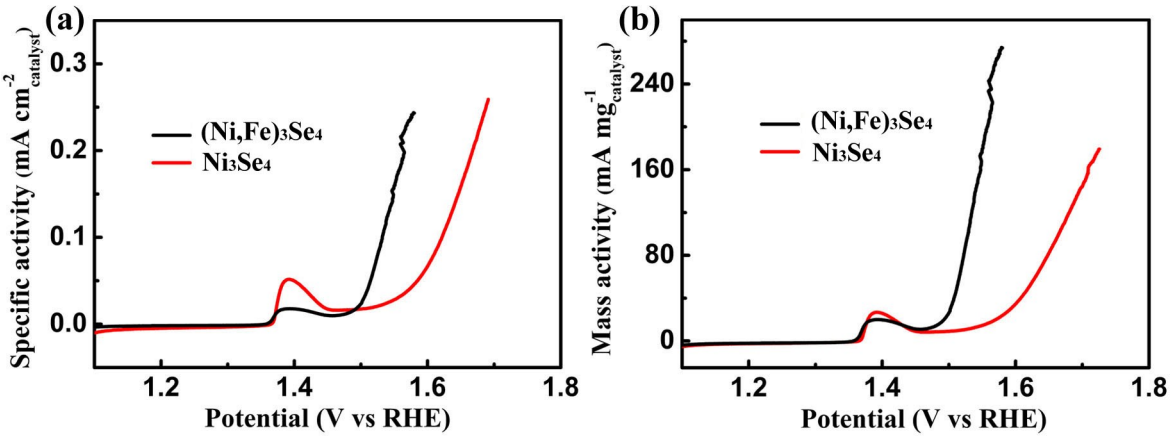

Fig. S6. (a) Specific and (b) mass activities of $(Ni,Fe)_3Se_4$ and Ni_3Se_4 electrodes for the OER in 1.0 M KOH.

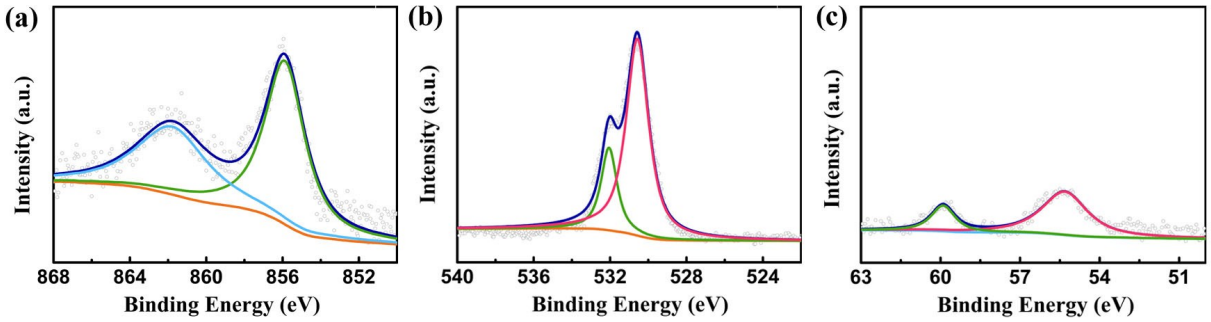

Fig. S7. XPS spectra of the (a) Ni 2p, (b) O 1s, and (c) Se 3d peaks of $(Ni,Fe)_3Se_4$ nanosheets after OER measurements.

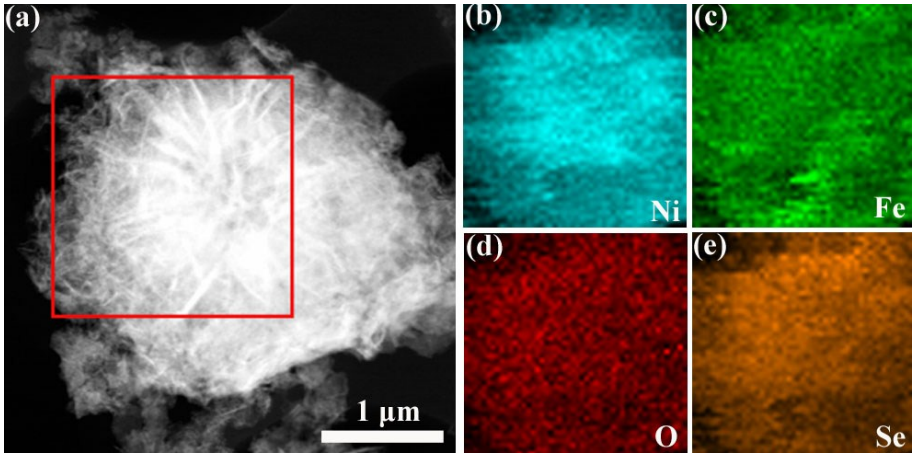

Fig. S8. EDX maps of $(Ni,Fe)_3Se_4$ nanosheets after OER measurements.

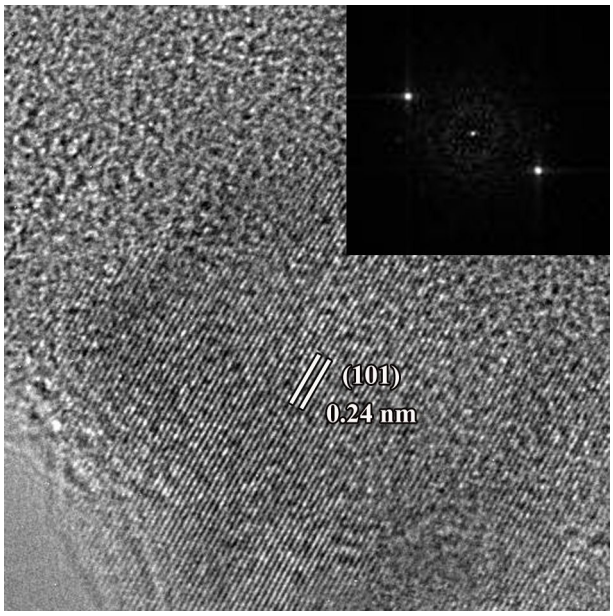

Fig. S9. HRTEM image of $(Ni,Fe)_3Se_4$ nanosheets after OER measurements.

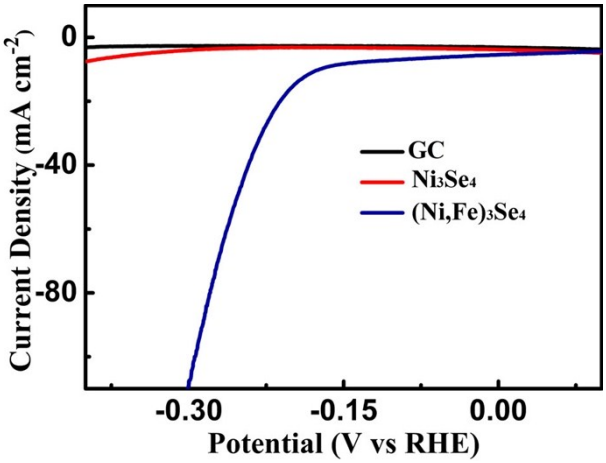

Fig. S10. Polarization curves of GC, Ni_3Se_4 and $(Ni,Fe)_3Se_4$ nanosheets in 1.0 M KOH at a potential sweep rate of 5 mV/s.

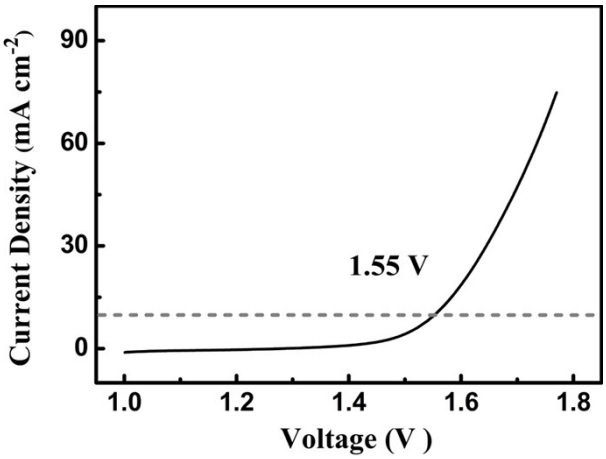

Fig. S11. Polarization curve of overall water splitting by using Pt/C-IrO_2 couple with a scan rate of 5 mV s^{-1} in 1 M KOH.