Dealloying-derived Fe-doped $Ni(OH)_2$/Ni foils as self-supported oxygen evolution reaction catalysts

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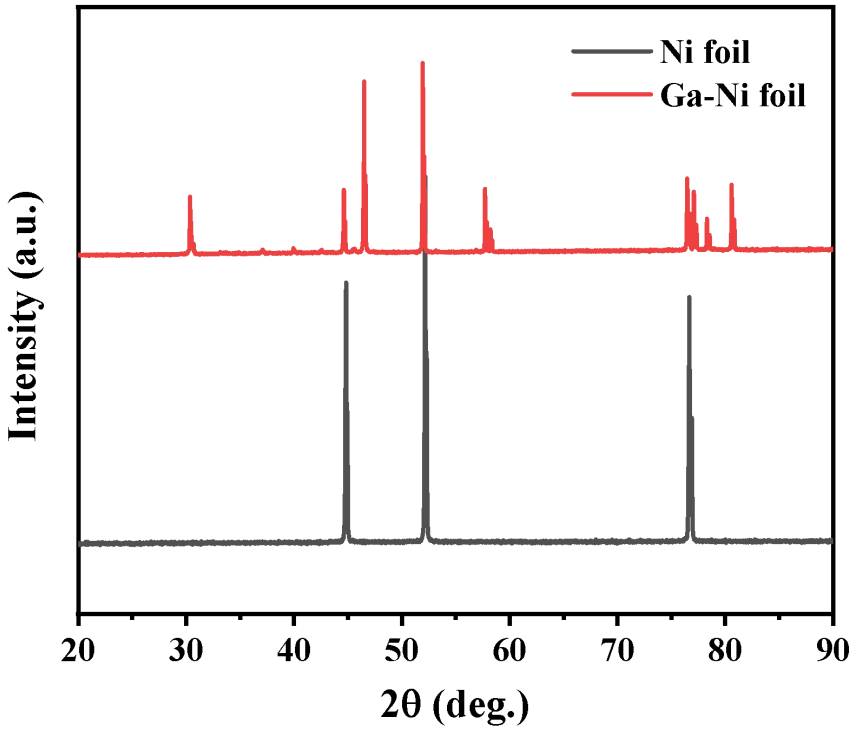


Figure S1. XRD patterns of Ni foil and Ga painted Ni foil. Ga phase (PDF # 05-0601) and Ni (PDF # 04-0850) coexist on the foil surface.

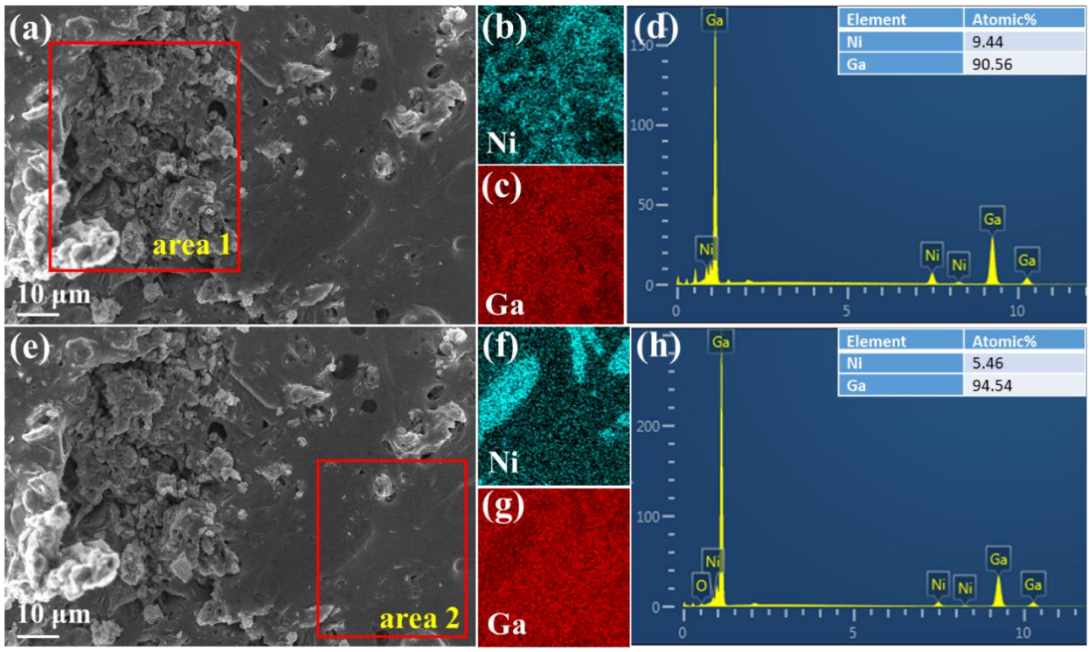


Figure S2. (a, e) Surface SEM images of Ga-Ni/200-1, (b-d) EDS-mapping and spectra corresponding to "area 1" in Figure S1a, (f-h) EDS-mapping and spectra corresponding to "area 2" in Figure S1e.

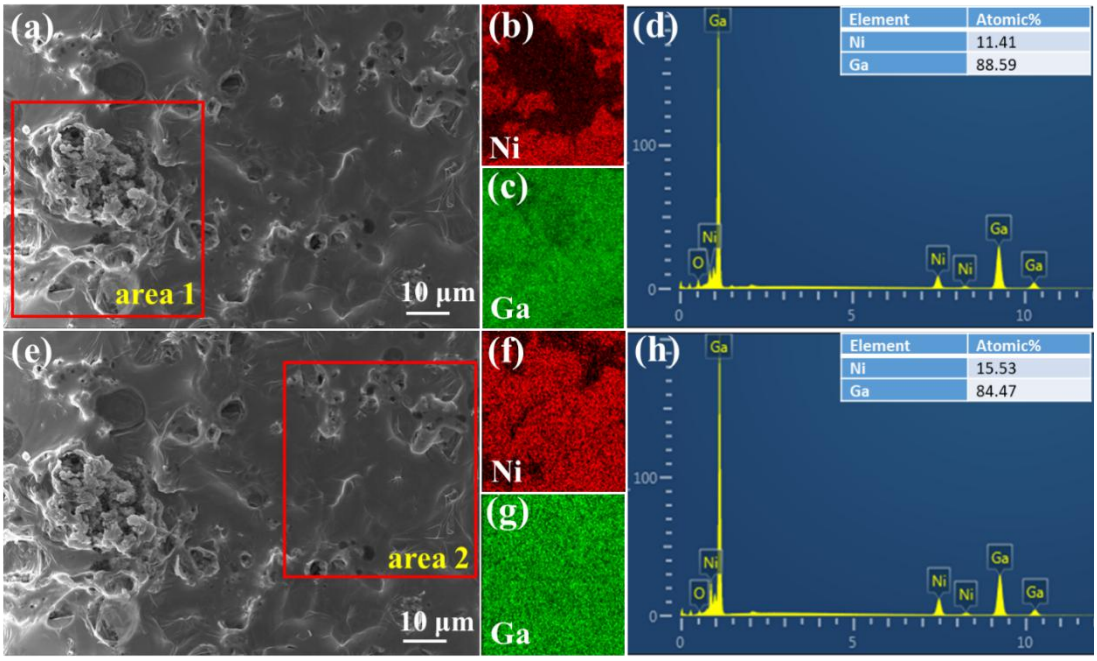


Figure S3. (a, e) Surface SEM images of Ga-Ni/200-3, (b-d) EDS-mapping and spectra corresponding to "area 1" in Figure S2a, (f-h) EDS-mapping and spectra corresponding to "area 2" in Figure S2e.

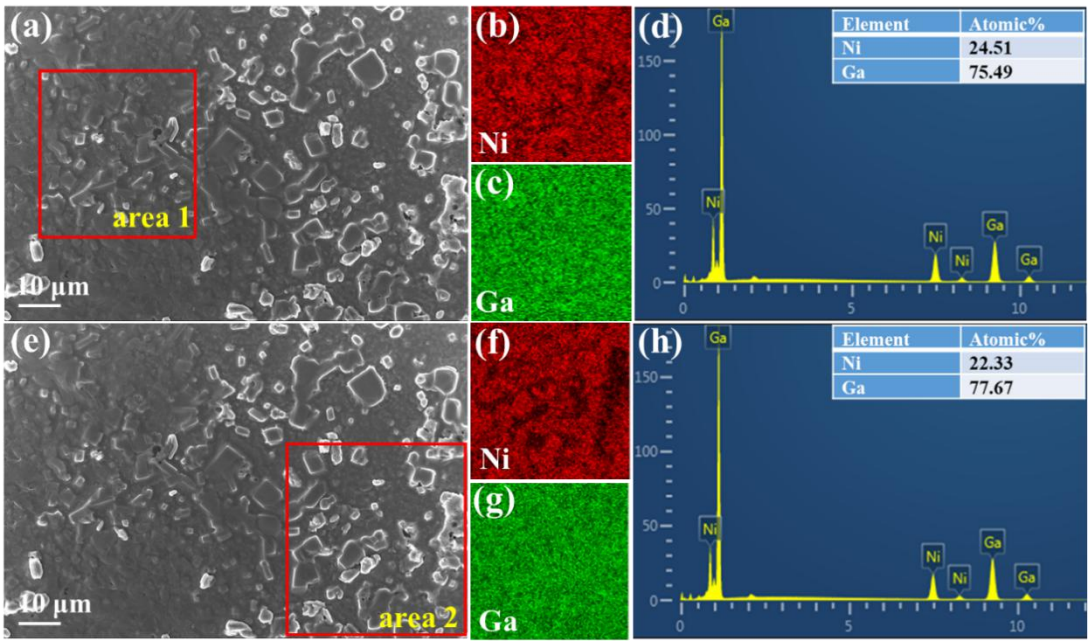


Figure S4. (a, e) Surface SEM images of Ga-Ni/200-6, (b-d) EDS-mapping and spectra corresponding to "area 1" in Figure S3a, (f-h) EDS-mapping and spectra corresponding to "area 2" in Figure S3e.

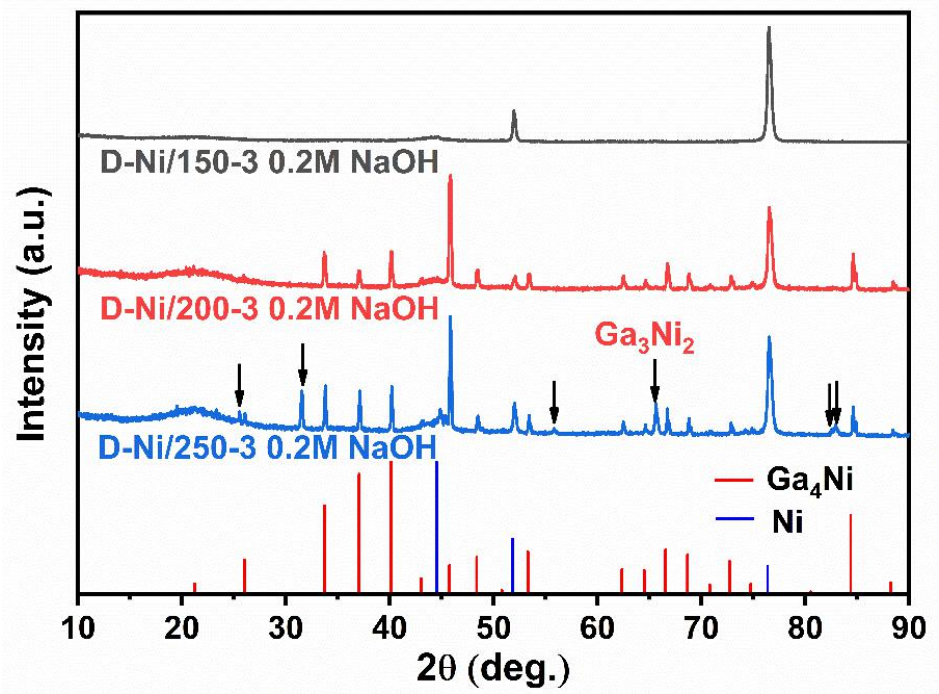
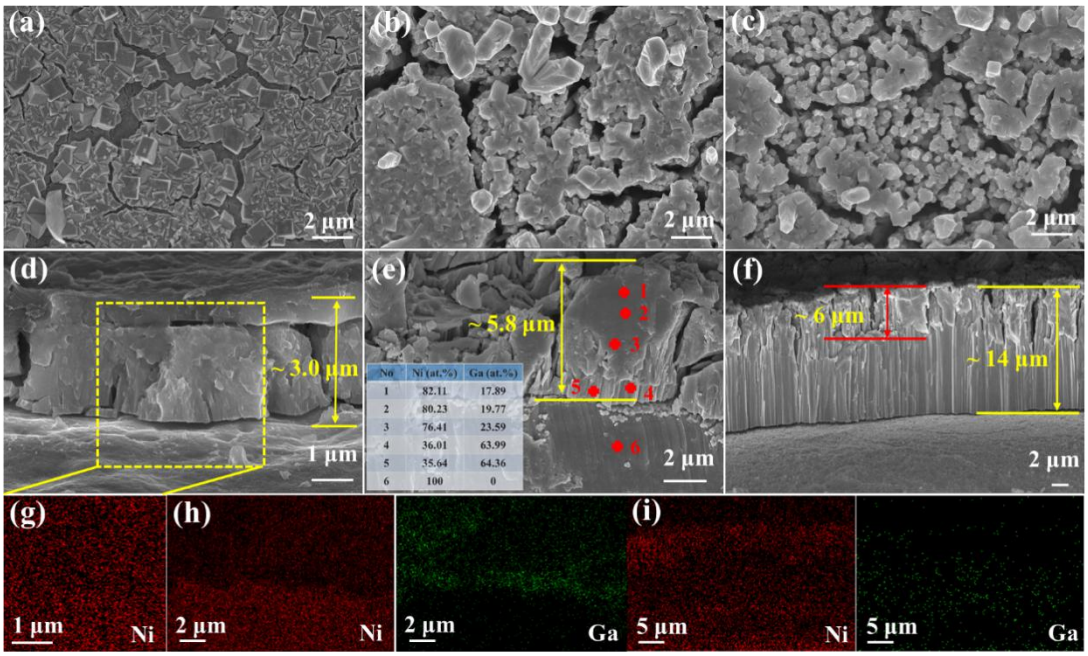


Figure S5. Dealloyed D-Ni/150-3, D-Ni/200-3 and D-Ni/250-3 in 0.2 M NaOH.



No	Ni (at.%)	Ga (at.%)
1	82.11	17.89
2	80.23	19.77
3	76.41	23.59
4	36.01	63.99
5	35.64	64.36
6	100	0

Figure S6. The surface microstructure of (a) D-Ni/150-3, (b) D-Ni/200-3 and (c) D-Ni/250-3 dealloyed in 0.2 M NaOH; (d-f) the cross-section view of D-Ni/150-3, D-Ni/200-3, and D-Ni/250-6. (g-i) the elemental mapping corresponding to (d-f). Inset of Figure S5e is the elemental ratios of Ni and Ga obtained from EDS point scan spectra.

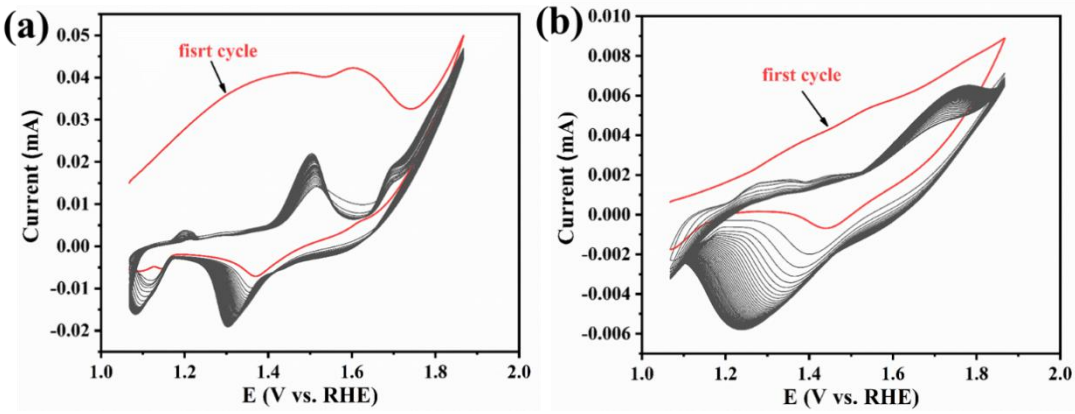


Figure S7. CV scanning at 50 mV s^{-1} of the D-Ni/200-3 foil in 1 M KOH without and with 0.1 M $Fe(NO_3)_3 \cdot 9H_2O$ to obtain O-Ni/200-3 and O-Ni-Fe/200-3.

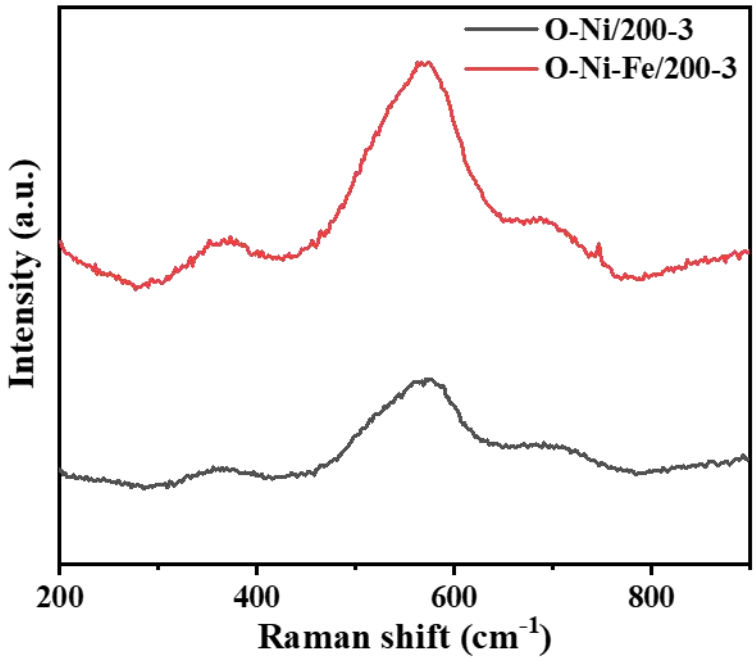


Figure S8. Raman spectra of O-Ni/200-3 and O-Ni-Fe/200-3.

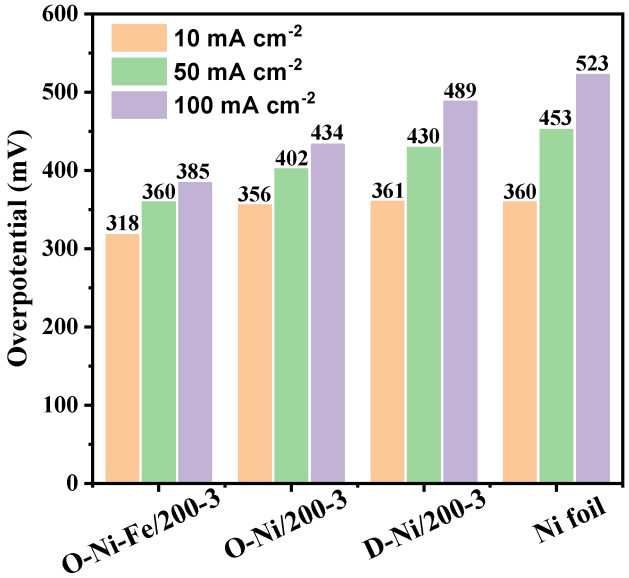


Figure S9. Overpotentials of different catalysts at 10, 50 and 100 mA cm^{-2}.

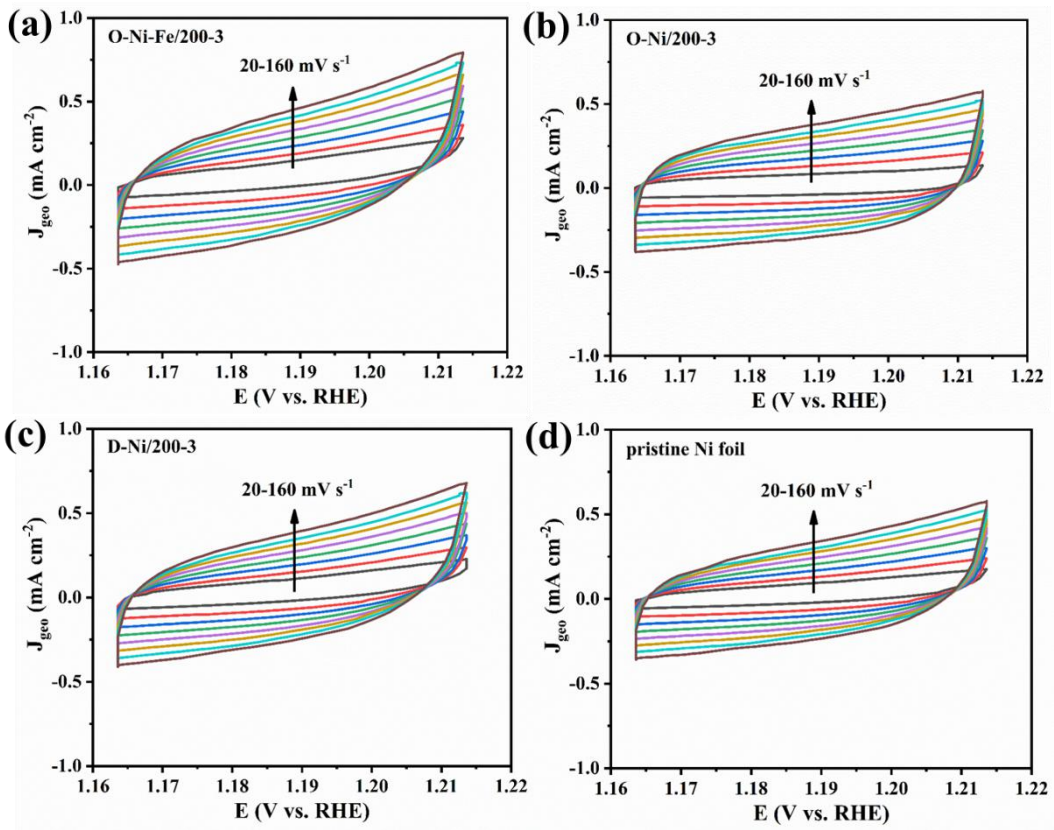


Figure S10. CVs for (a) O-Ni-Fe/200-3, (b) O-Ni-Fe/200-3, (c) O-Ni-Fe/200-3 and (d) pristine Ni foil measured in the potential range from 1.1644−1.2144 V *vs.* RHE at different scan rates in the 1 M KOH electrolyte.

Table S1. The surface elemental concentration obtained from XPS.

Element	Atomic %
C 1s	48.03
Fe 2p	2.95
Ga 3d	1.39
Ni 2p	9.36
O 1s	38.27