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Supporting Information

Anchored $RuSe_2$ Nanospheres on Co-N-C Nanosheets Boost Electrocatalytic Alkaline Hydrogen Evolution

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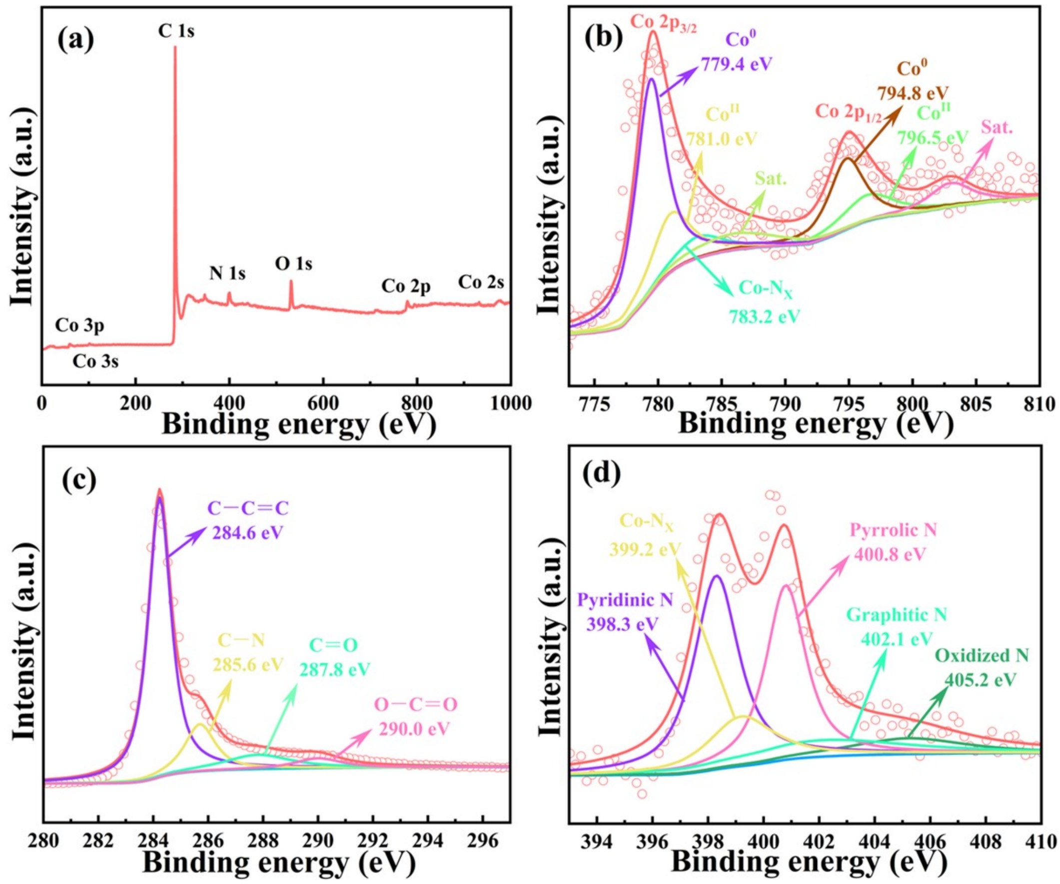

Fig. S1. XPS spectra of Co-N-C. (a) Survey scan, (b) Co 2p , (c) C 1s and (d) N 1s spectrum.

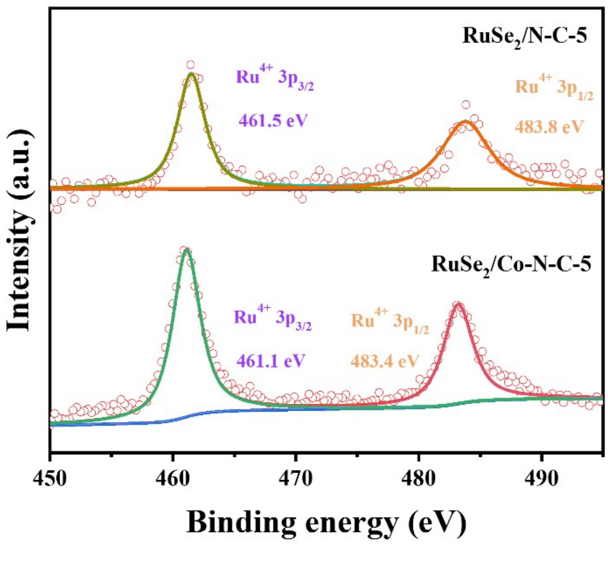

Fig. S2. Ru 3p spectra of $RuSe_2$/Co-N-C-5 and $RuSe_2$/N-C-5.

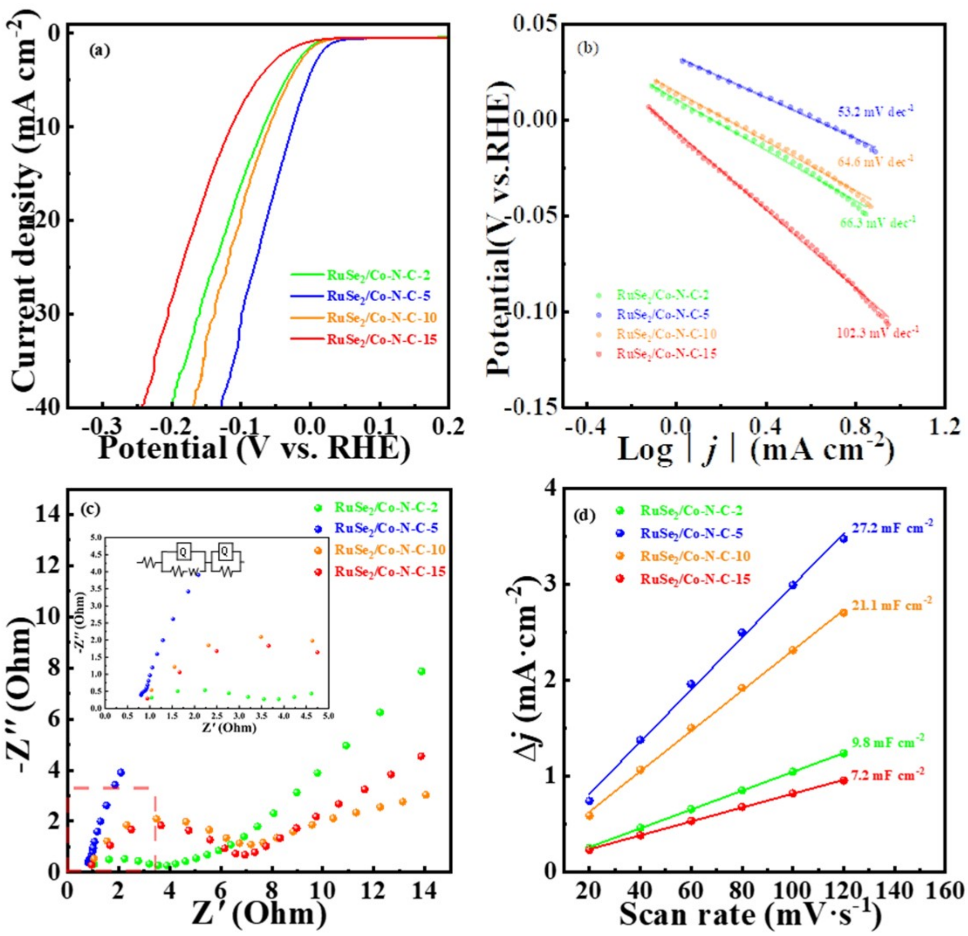

Fig. S3. HER performance of different catalysts in 1.0 KOH. (a) Polarization curves, (b) Tafel slopes, (c) EIS curves and (d) double-layer capacitance (C_{dl}).

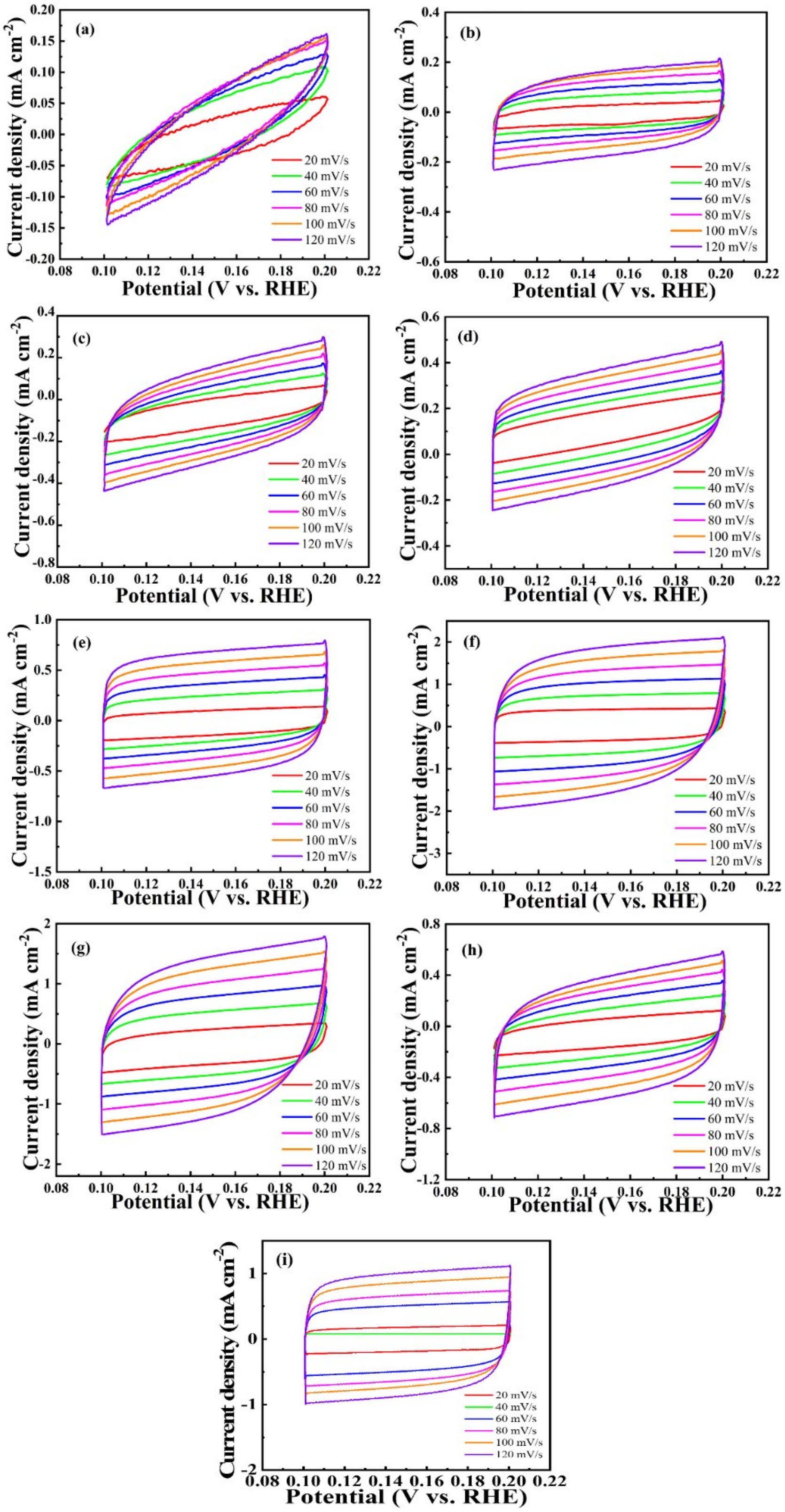

Fig. S4. CV curves of (a) Co-N-C, (b) Fresh $RuSe_2$, (c) $RuSe_2$-400, (d) Fresh $RuSe_2$/Co-N-C-5, (e) $RuSe_2$/Co-N-C-2, (f) $RuSe_2$/Co-N-C-5, (g) $RuSe_2$/Co-N-C-10, (h) $RuSe_2$/Co-N-C-15 and (i) $RuSe_2$/N-C-5 at different scan rates.

Table S1. Comparison of HER performance for $RuSe_2$/Co-N-C-5 in this work and recently reported HER electrocatalysts in 1 M KOH.

Catalyst	Substrate	Tafel slope (mV dec^{-1})	Overpotential (mV@10 mA cm^{-2})	Ref
$RuSe_2$/g-C_3N_4	GC	74.8	95	S1
$RuSe_2$@NC	GC	32	30	S2
***h*-$RuSe_2$**	GC	95	34	S3
$RuSe_2$-500	GC	53	29	S4
$RuSe_2$/CNTs	GC	80	48	S5
Pt @CoS	GC	31	28	S6
Pt-Co/CoO_x	GC	29.3	28	S7
PtNi-NC-900	GC	43.2	37.4	S8
Pt/MXene	GC	29.7	34	S9
MoS_2-NTA	AAO	35	32	S10
Pt-PdO/C	GC	36	29	S11
$RuSe_2$/Co-N-C-5	GC	53.2	26.4	This work

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