Electronic Supplementary Material

Construction of robust and durable Cu_2Se-V_2O_5 nanosheet electrocatalyst for alkaline oxygen evolution reaction

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Table S1 Microstructural parameters of grown products.

Samples	a (Å)	b (Å)	c (Å)	Volume (Å^3)	d-spacing	Average crystallite size (nm)	Lattice strain ε $\times10^{-3}$	Dislocation Density δ$\times10^{-3}$ (nm^{-2})
Cu_2Se	5.69676	-	-	184.8769	1.7411	67	0.5426	0.2209
V_2O_5	11.4490	4.3685	3.5507	177.5886	3.2084	74	0.5121	0.1844
In composite								
Cu_2Se	5.69469	-	-	184.6761	1.7382	63	0.5917	0.2525
V_2O_5	11.4400	4.3626	3.5539	177.3689	3.2076	62	0.6039	0.2627

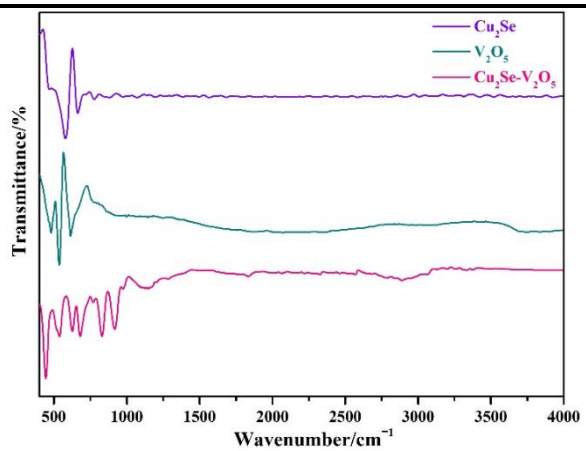

Fig. S1. FTIR spectra of Cu_2Se, V_2O_5, and Cu_2Se-V_2O_5 nanohybrid.

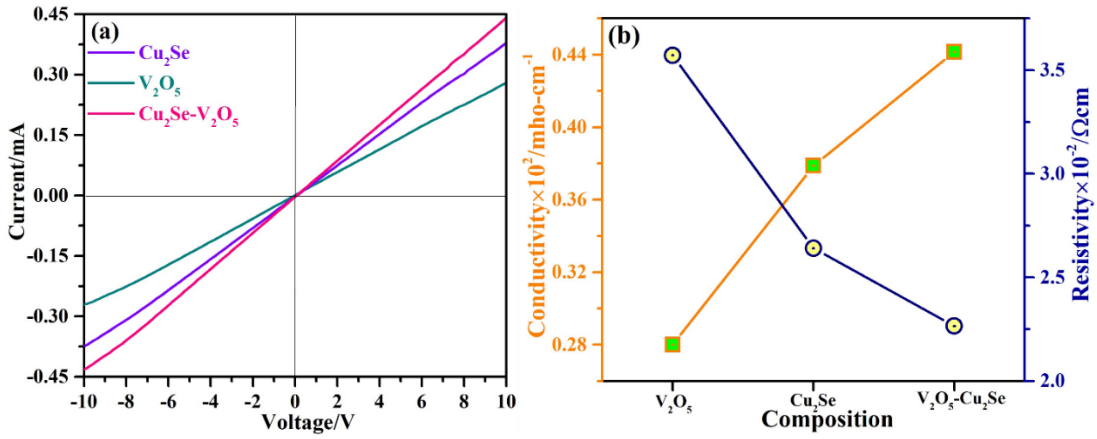

Fig. S2. Electrical characteristics of Cu_2Se, V_2O_5, and Cu_2Se-V_2O_5 nanohybrid (a) IV curves and (b) comparison of conductivity and resistivity.

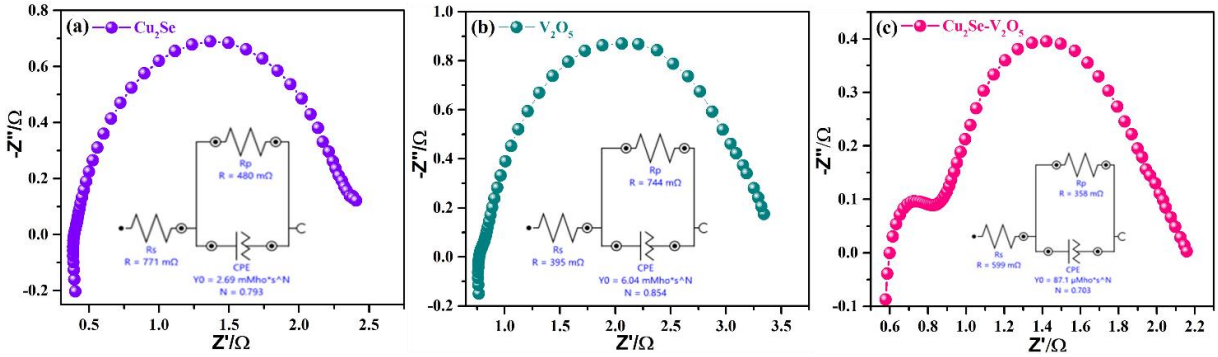

Fig. S3. Separate Nyquist impedance plots along with circuit fitting (a) Cu_2Se, (b) V_2O_5, and (c) Cu_2Se-V_2O_5.

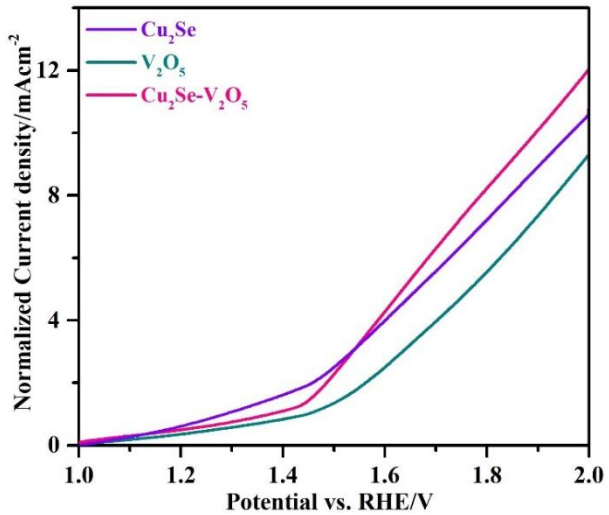

Fig. S4. Normalized current density for Cu_2Se-V_2O_5.

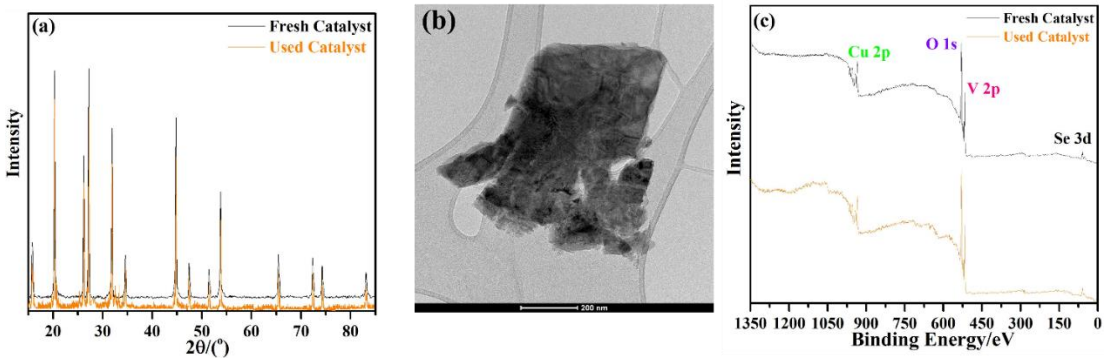

Fig. S5. (b) XRD pattern, (b) TEM image, and (c) XPS spectra, of fresh and used Cu_2Se-V_2O_5 nanohybrid.

Table S2 Comparison of efficient OER performance of electrocatalysts with reported electrocatalysts.

Catalysts	Electrolyte	Morphology	Overpotential (η)	Current density (mA/cm^2)	Tafel slope (mV/dec)	Ref.
Ni_3Se_2-Au	0.3 M KOH	Film	320 mV	10	97.1	[1]
$CoTe_2$@CuTe	1 M PBS	Sphere	106 mV	10	67.6	[2]
CoNiP	1 M KOH	Nanosheet	155 mV	10	115	[3]
V-CoP	1 M KOH	Nanowires	87 mV	10	65.4	[4]
V-Co_xP@NC	1 M KOH	Dodecahedron str.	354mV	50	79	[5]
V_2O_5-MoS_2	1 M KOH	Flowery str.	244 mV	10	57	[6]
VO_x/NiS_2	1 M KOH	Nanosheet	358 mV	100	82	[7]
$CuCo_2Se$	1 M KOH	Granular	320 mV	50	-	[8]
FeV/Co	1 M KOH	Meso-porous particles	280 mV	10	78.2	[9]
Cu_2Se-V_2O_5	1 M KOH	Staggered nanosheet	128 mV	10	57	This work

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