Supporting Information for

Catalytic Transfer Hydrogenation of Ethyl Levulinate to γ-valerolactone over Supported MoS₂ Catalysts

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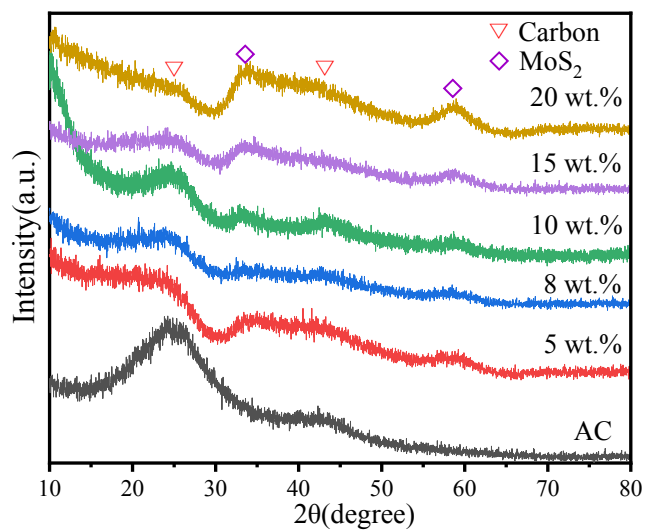
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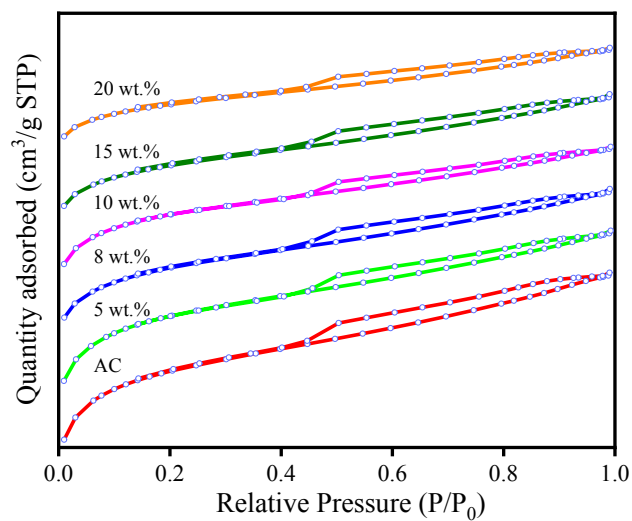
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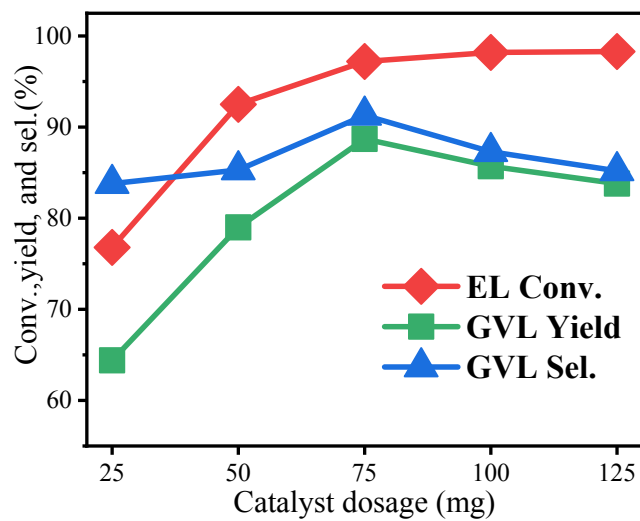
SECTION S1 SUPPLYMENTARY FIGURES

Fig. S1 XRD patterns of the AC support and MoS$_2$/AC catalysts with different Mo loadings.

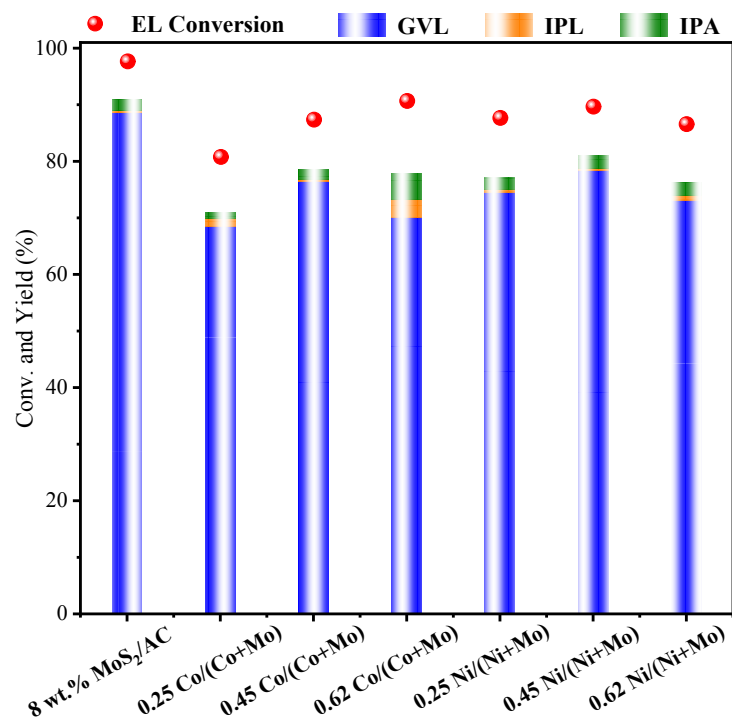# SECTION S1 SUPPLYMENTARY FIGURES

Fig. S2 Nitrogen adsorption-desorption isotherms of the AC support and MoS$_2$/AC catalysts with different Mo loadings.
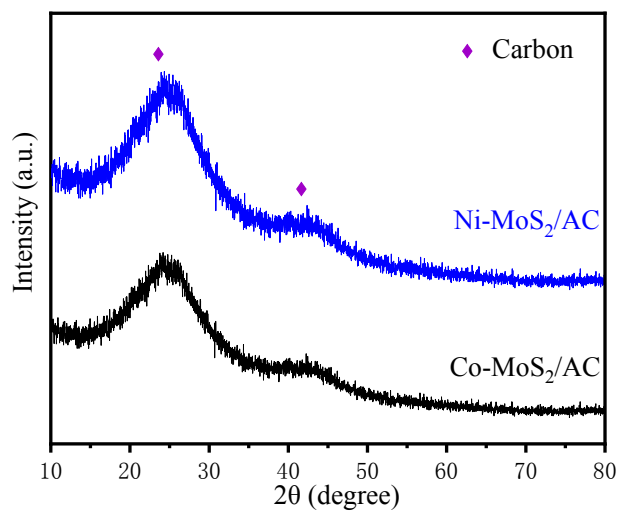
SECTION S1 SUPPLYMENTARY FIGURES

Fig. S3 Effects of the catalyst dosage on the conversion of EL into GVL. Reaction condition: EL 2 mmol, isopropanol 20 mL, 230 ℃,1.5 h, 1 MPa H_2.
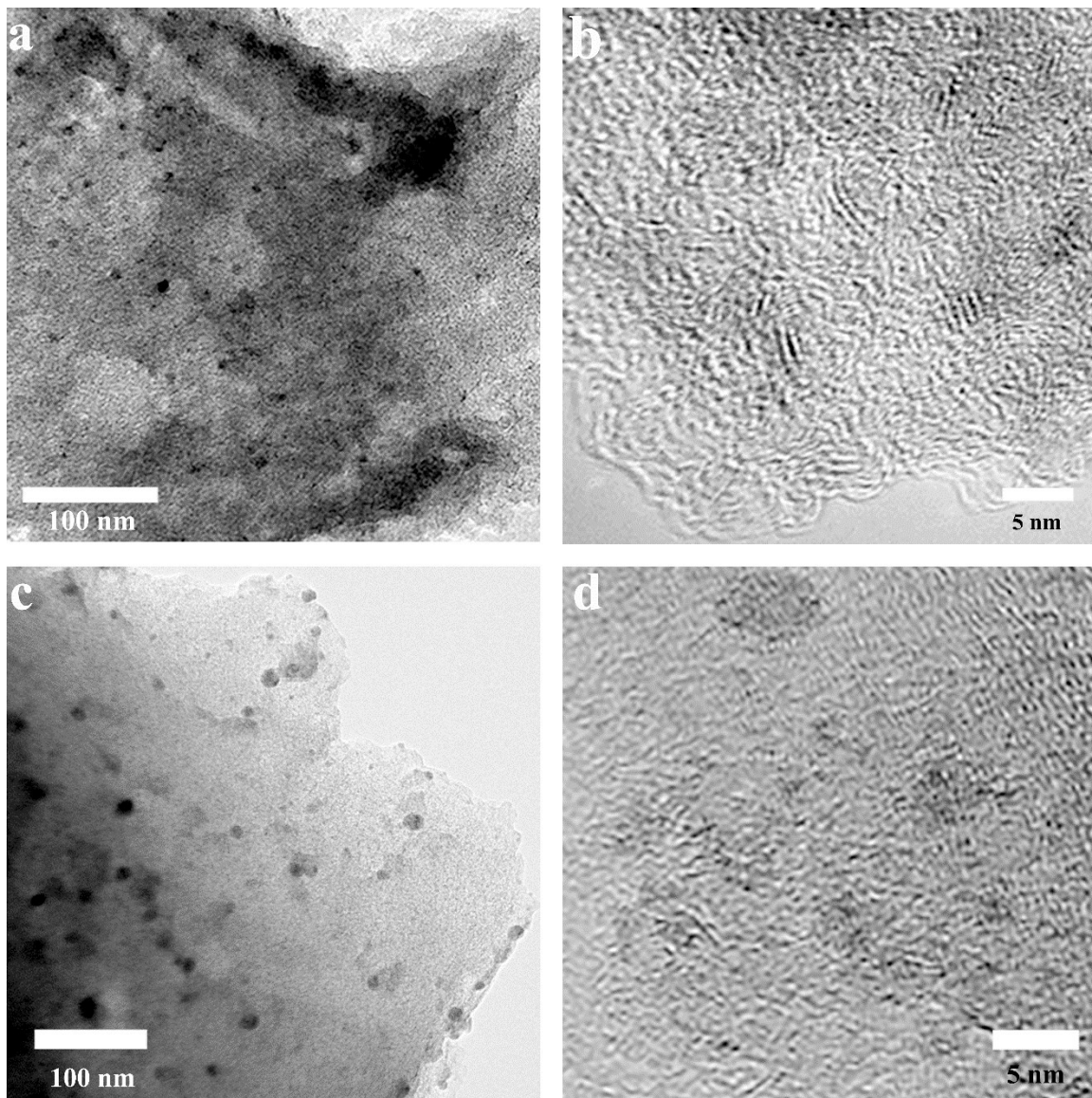
SECTION S1 SUPPLYMENTARY FIGURES

Fig. S4 Effects of the Co/Ni doping on the conversion of EL into GVL over MoS$_2$/AC catalyst. Reaction condition: EL 2 mmol, catalyst 75 mg, isopropanol 20 mL, 230 ℃, 1.5 h, 1 MPa H$_2$.

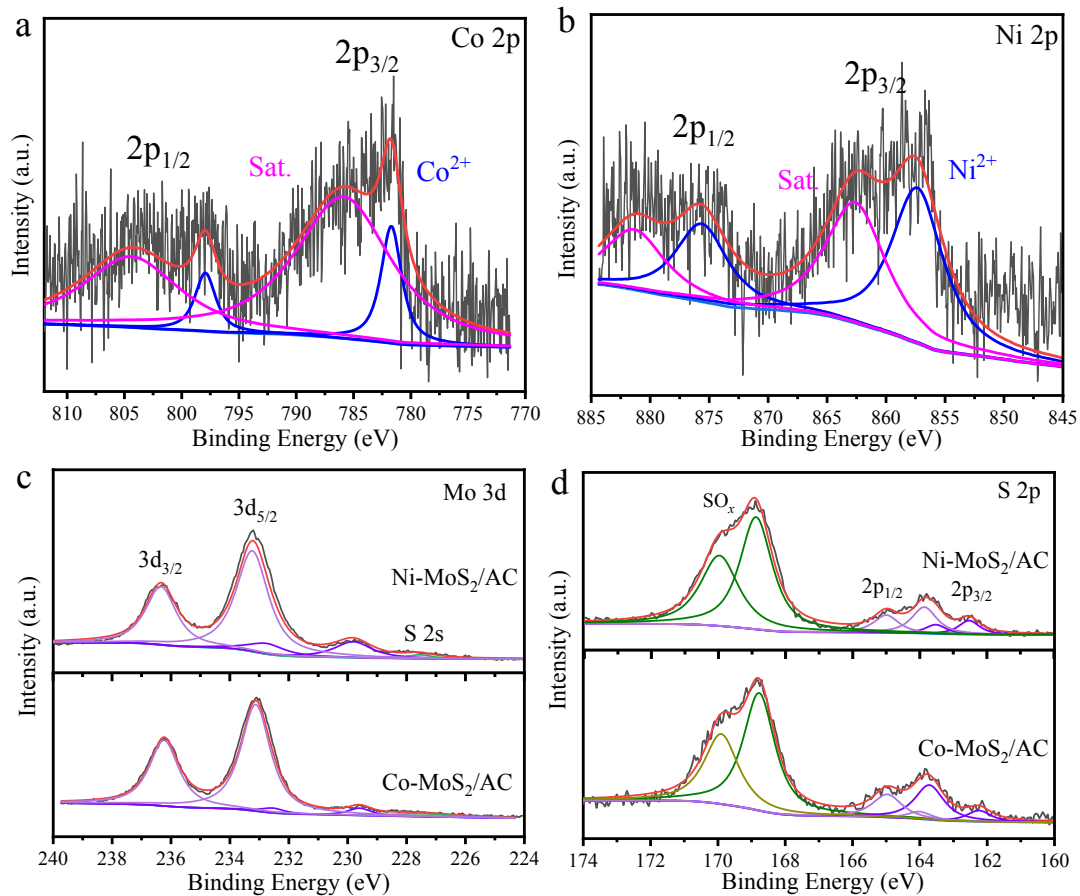# SECTION S1 SUPPLYMENTARY FIGURES

Fig. S5 XRD patterns of Co-MoS$_2$ (Co/(Co+Mo)=0.45) and Ni-MoS$_2$ (Ni/(Ni+Mo)=0.45)

SECTION S1 SUPPLYMENTARY FIGURES

Fig. S6 TEM images of (a-b) Ni-MoS$_2$/AC (Ni/(Ni+Mo) =0.45) and (c-d) Co-MoS$_2$/AC (Co/(Co+Mo)=0.45) catalysts.
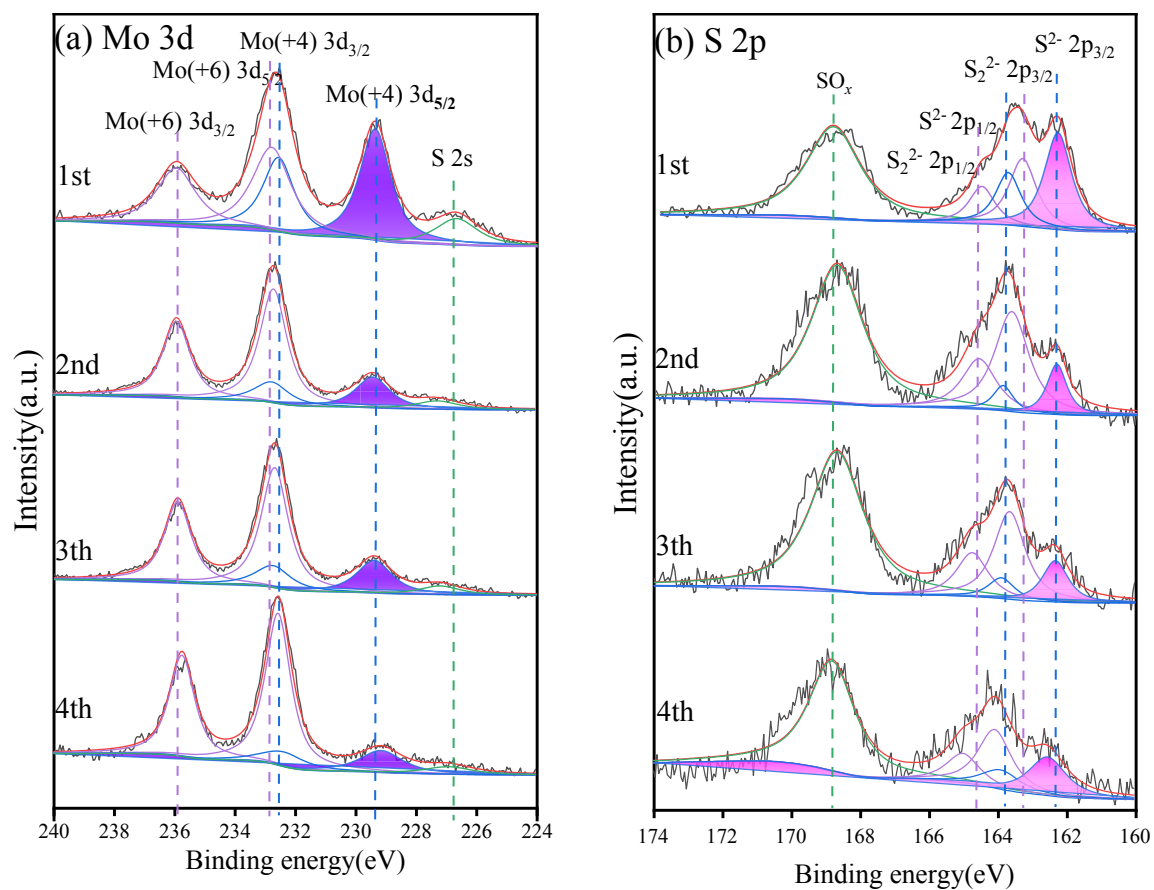
SECTION S1 SUPPLYMENTARY FIGURES

Fig. S7 XP spectrum of Co-MoS$_2$/AC (Co/(Co+Mo)=0.45) and Ni-MoS$_2$/AC (Ni/(Ni+Mo)=0.45) catalysts.

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Fig. S8 XP spectrum of fresh and spent 8 wt.% MoS₂/AC catalyst (a) Mo 3d and (b) S 2p.

SECTION S2 SUPPLYMENTARY TABLES

Table S1. Textural properties of activated carbon and MoS_2/AC catalyst

Sample	BET surface area [a] (m^2/g)	Pore volume (cm^3/g)	Pore size [b] (nm)
AC	1161	0.39	3.88
5 wt.% MoS_2/AC	968	0.34	3.87
8 wt.% MoS_2/AC	763	0.31	3.91
10 wt.% MoS_2/AC	741	0.27	3.89
15 wt.% MoS_2/AC	618	0.27	3.96
20 wt.% MoS_2/AC	507	0.21	3.98

[a]BET surface area. [b]Average pore volume calculated by the BJH method from desorption branches

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Table S2 XPS quantitative analysis of the fresh and spent 8 wt.% MoS$_2$/AC catalysts

Samples	Atomic (%) [a]			
	Mo 3d	S 2p	O 1s	C 1s
1st	1.82	0.97	11.28	85.93
2nd	1.75	0.63	11.96	85.65
3th	1.43	0.66	11.53	86.38
4th	0.8	0.36	13.62	85.66

[a]Calculated from XPS quantitative analysis