
Supporting Information

**A Highly Active NiMoAl Catalyst Prepared by Solvothermal
Method for the Hydrogenation of Methyl Acrylate**

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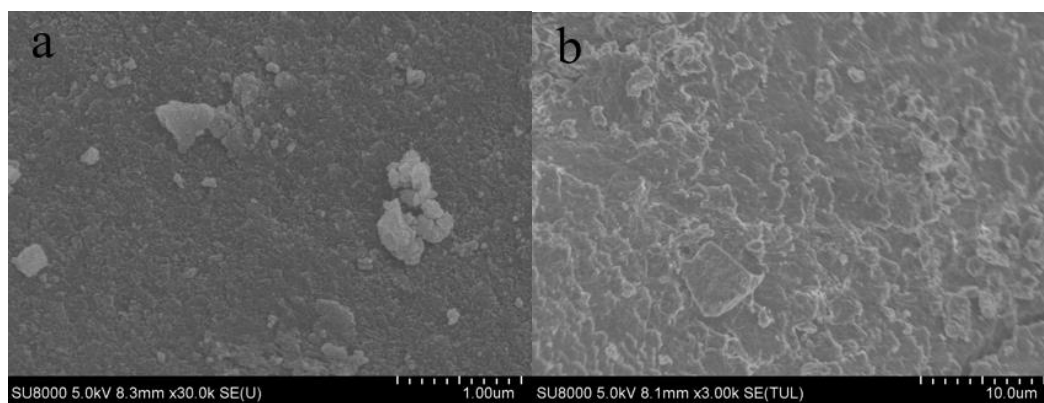


Figure S1. SEM images of (a) Mo_{10}Al and (b) Ni_{10}Al catalyst precursors

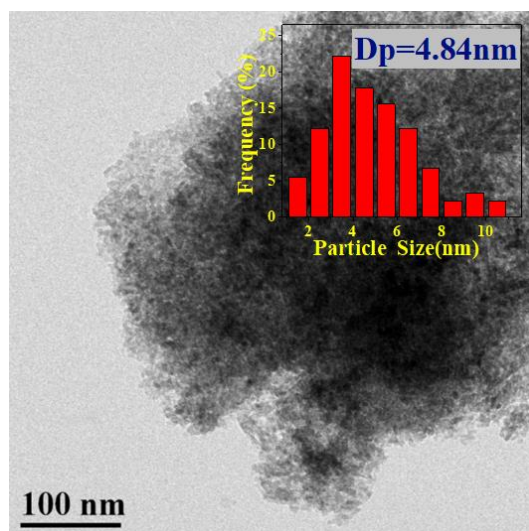


Figure S2. TEM image of reduced $\text{Ni}_{10}\text{Mo}_{10}/\gamma\text{-Al}_2\text{O}_3$ catalyst after reduction at 450 °C

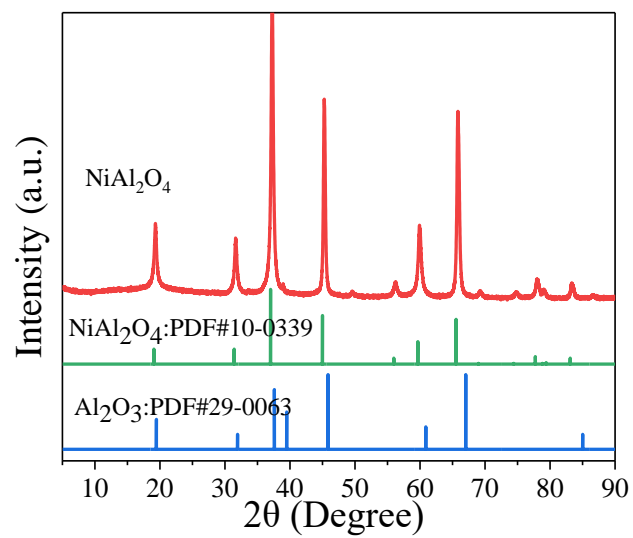


Figure S3. XRD patterns of NiAl_2O_4

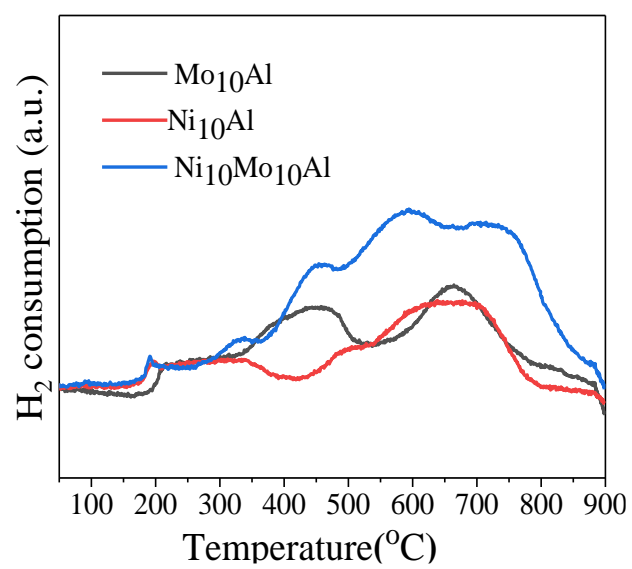


Figure S4. H₂-TPR profiles of Ni₁₀Al, Mo₁₀Al, Ni₁₀Mo₁₀Al catalysts

Table S1. Properties of NiAl₂O₄, Ni₁₀Mo₁₀Al and Ni₁₀Mo₁₀/γ-Al₂O₃ catalysts

Catalyst	Yield ^a (%)	Ni content ^b (wt%)	Mo content ^b (wt%)	Mean particle Size ^c (nm)
Ni ₁₀ Mo ₁₀ Al	89.5	6.58	6.07	1.91
Ni ₁₀ Mo ₁₀ /γ-Al ₂ O ₃	53.7	7.52	6.24	4.84
NiAl ₂ O ₄	0.54	-	-	-

^a Catalytic evaluation of NiAl₂O₄, Ni₁₀Mo₁₀Al and Ni₁₀Mo₁₀/γ-Al₂O₃ catalysts at the reaction conditions of 100 °C, 1 MPa H₂, n(H₂)/n(MA) = 4 and WHSV = 2 h⁻¹

^b Content of Ni and Mo calculated on the ICP–OES analysis.

^c Determined from TEM analysis.

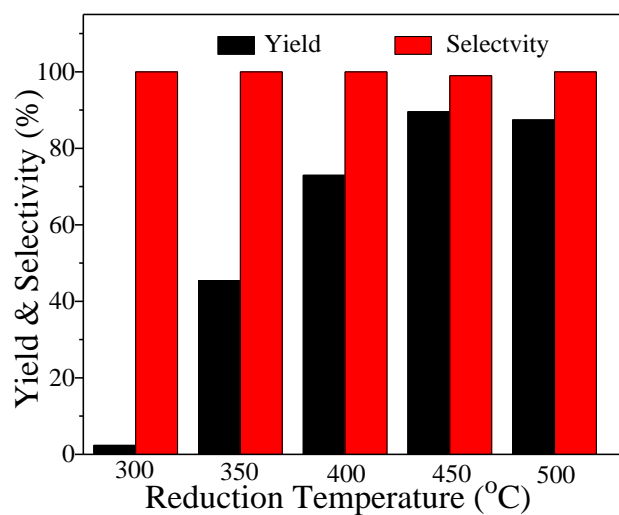


Figure S5. Effect of reduction temperature on the catalytic activity of $\text{Ni}_{10}\text{Mo}_{10}\text{Al}$ catalyst at the reaction conditions of 100 °C, 1 MPa H_2 , $n(\text{H}_2)/n(\text{MA}) = 4$ and $\text{WHSV} = 2 \text{ h}^{-1}$

Table S2. ICP–OES results for the fresh and deactivated Ni₁₀Mo₁₀Al catalysts

Catalyst	Ni content (wt%)	Mo content (wt%)
Ni ₁₀ Mo ₁₀ Al (fresh)	6.58	6.07
Ni ₁₀ Mo ₁₀ Al (used)	5.71	5.81

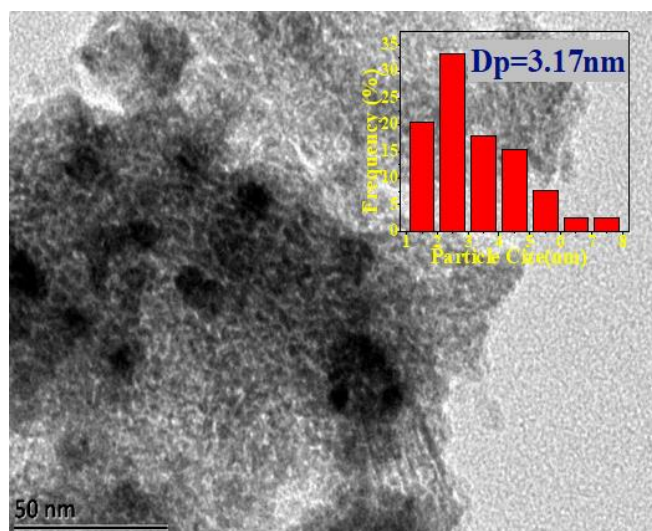


Figure S6. TEM images of the deactivated $\text{Ni}_{10}\text{Mo}_{10}\text{Al}$ catalysts