

Supplementary information for

MoO_x decorated-Ru/TiO₂ with monomeric structure boosts the selective one-pot conversion of levulinic acid to 1,4-pentanediol

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Contents:

- 1) Total acidity of typical Ru and Ru-MoO_x/TiO₂ catalysts (**Table S1**).
- 2) XRD patterns of Ru-MoO_x/TiO₂ (Mo = 0.47 wt%; Mo/Ru = 1:10.5) after reduction with H₂ at (a) 400 °C and (b) 500 °C and 600 °C for 1.5 h (Fig. S1).
- 3) (a) Kinetics profiles and (b) Arrhenius plot of LA hydroconversion GVL and 1,4-PeD over Ru-(0.47)MoO_x/TiO₂ catalyst (Fig. S2).
- 4) (a) Kinetics profiles and (b) Arrhenius plot of LA hydroconversion GVL and 1,4-PeD over Ru (5 wt%)/TiO₂ catalyst (Fig. S3).
- 5) NH₃-TPD profiles of Ru-(y)MoO_x/TiO₂ and deconvoluted NH₃-TPD spectra of Ru-(0.24) MoO_x/TiO₂ (Mo = 0.24 wt%; Mo/Ru = 1:19.5), Ru-(0.47) MoO_x/TiO₂ (Mo = 0.47 wt%; Mo/Ru = 1:10.5), and Ru-(0.91) MoO_x/TiO₂ (Mo = 0.90 wt%; Mo/Ru = 1:5.3) catalysts (**Fig. S4**).
- 6) Pyridine-adsorption profiles of (a) Ru-(5 wt%)/TiO₂, (b) Ru-(0.47) MoO_x/TiO₂ (Mo = 0.47 wt%; Mo/Ru = 1:10.5), and (c) Ru-(0.91) MoO_x/TiO₂ (Mo = 0.90 wt%; Mo/Ru = 1:5.3) catalysts (**Fig. S5**).
- 7) XRD patterns of (a) fresh and (b) recovered Ru-(0.47)MoO_x/TiO₂ after the second reaction run (Fig. S6).

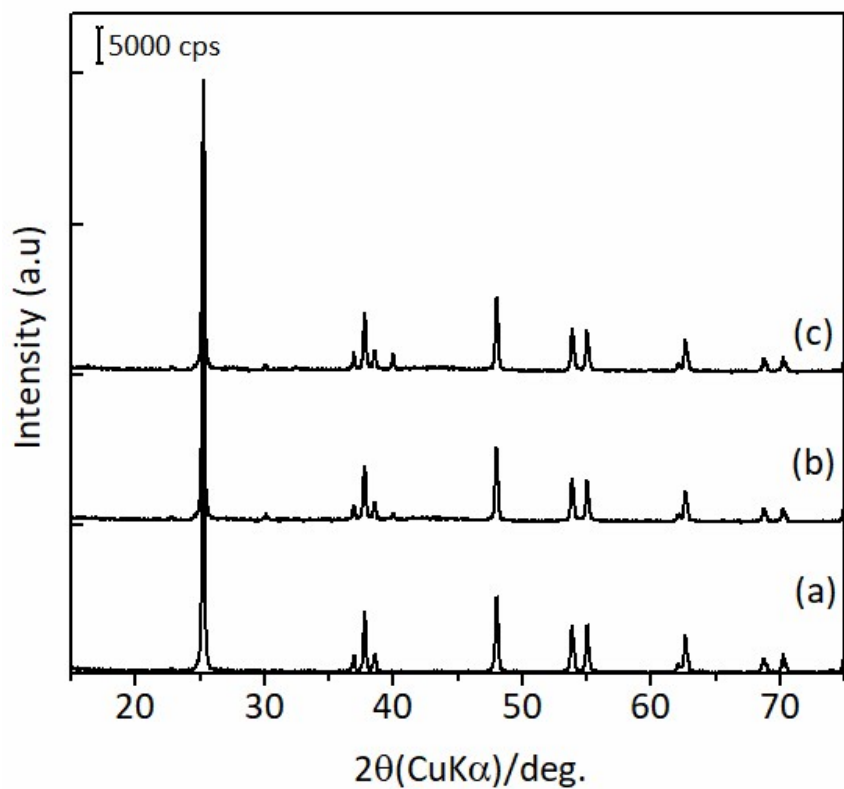


Fig. S1 XRD patterns of Ru-MoO_x/TiO₂ (Mo = 0.47 wt%; Mo/Ru = 1:10.5) after reduction with H₂ at (a) 400 °C and (b) 500 °C and (c) 600 °C for 1.5 h.

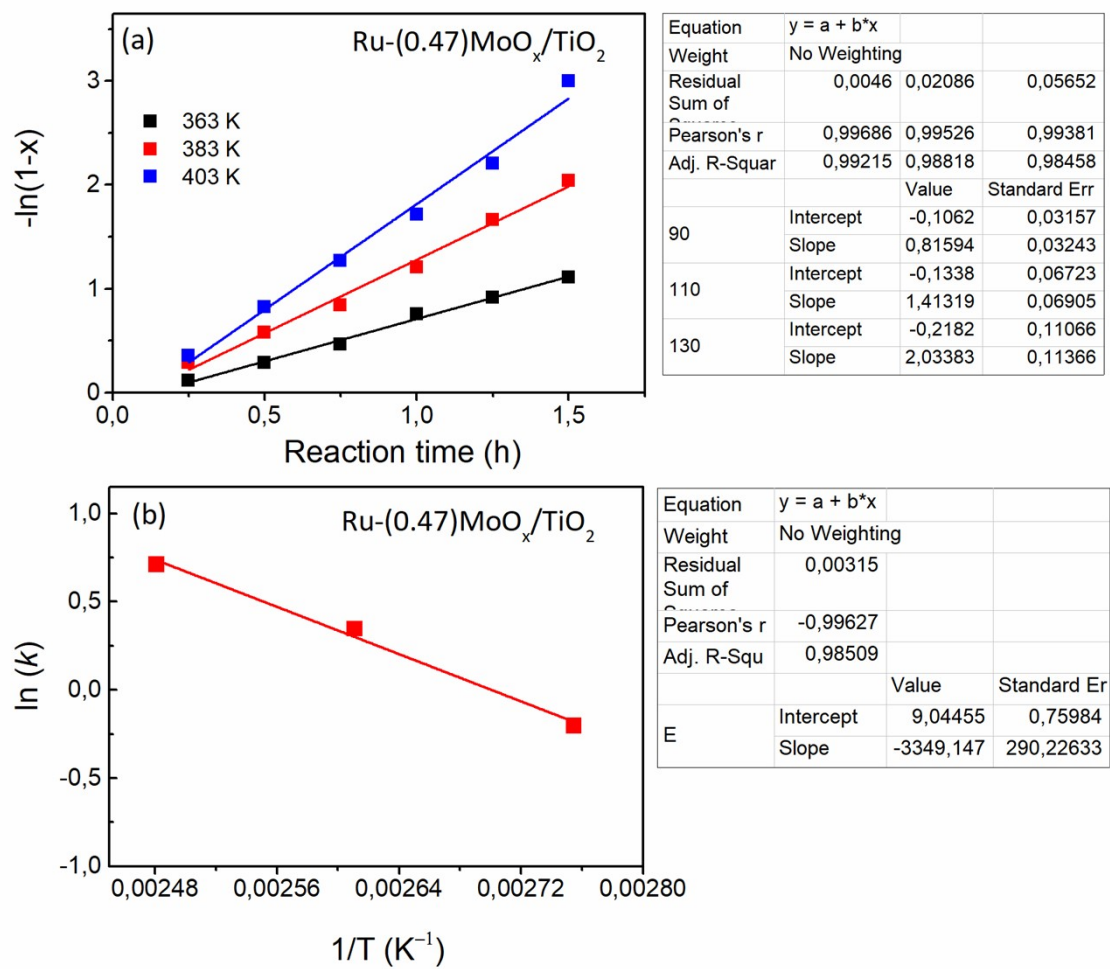


Fig. S2 (a) Kinetics profiles and (b) Arrhenius plot of LA hydroconversion to 1,4-PeD over Ru-(0.47)MoO_x/TiO₂ catalyst.

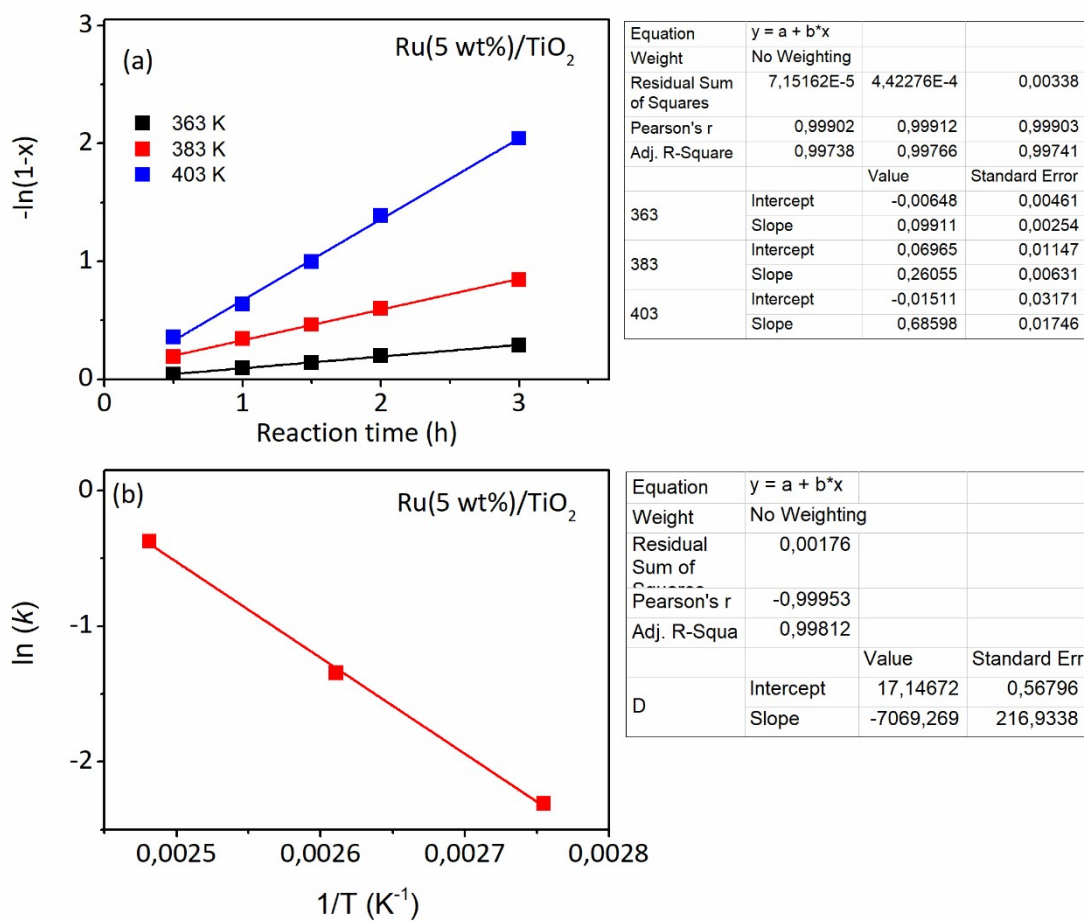


Fig. S3 (a) Kinetics profiles and (b) Arrhenius plot of LA hydroconversion to 1,4-PeD over Ru (5 wt%)/TiO₂ catalyst.

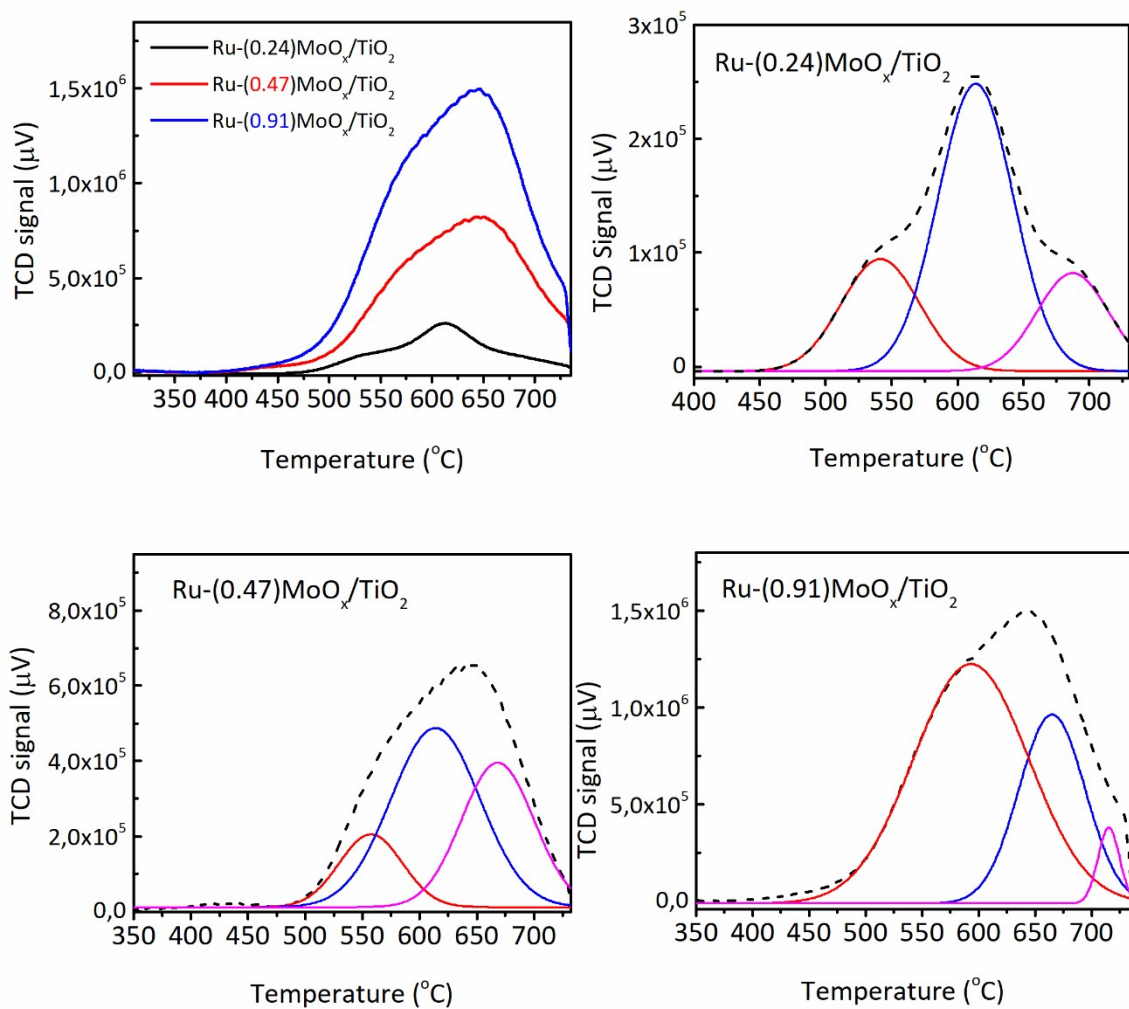


Fig. S4 NH₃-TPD profiles of Ru-(y)MoO_x/TiO₂ and deconvoluted NH₃-TPD spectra of Ru-(0.24) MoO_x/TiO₂ (Mo = 0.24 wt%; Mo/Ru = 1:19.5), Ru-(0.47) MoO_x/TiO₂ (Mo = 0.47 wt%; Mo/Ru = 1:10.5), and Ru-(0.91) MoO_x/TiO₂ (Mo = 0.90 wt%; Mo/Ru = 1:5.3) catalysts.

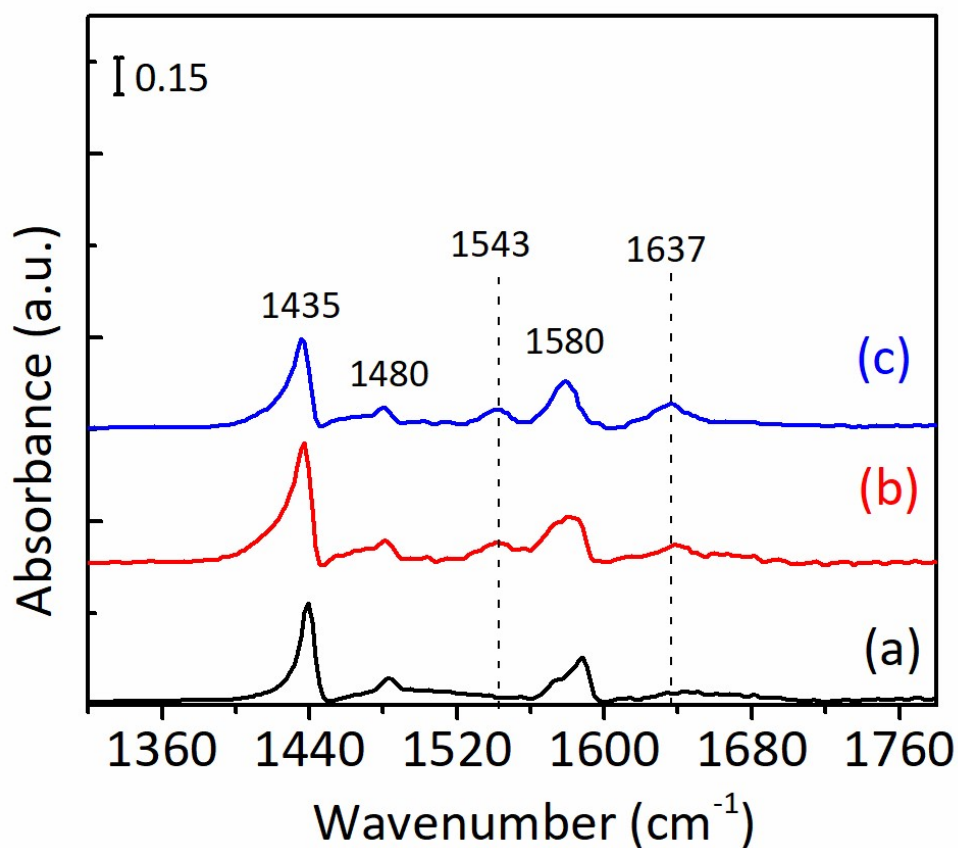


Fig. S5 Pyridine-adsorption profiles of (a) Ru-(5 wt%)/TiO₂, (b) Ru-(0.47) MoO_x/TiO₂ (Mo = 0.47 wt%; Mo/Ru = 1:10.5), and (c) Ru-(0.91) MoO_x/TiO₂ (Mo = 0.90 wt%; Mo/Ru = 1:5.3) catalysts.

Table S1. Total acidity of typical Ru and Ru-MoO_x/TiO₂ catalysts

Entry	Catalyst	Total surface acidity	
		NH ₃ -TPD ^a (μmol NH ₃ g ⁻¹)	Pyridine-adsorption ^b (μmol Pyridine g ⁻¹)
1	Ru (5 wt%)/TiO ₂	Nd	0.49
2	Ru-(0.47)MoO _x /TiO ₂	201	2.53
3	Ru-(0.91)MoO _x /TiO ₂	321	24.21

^a The acidity was measured by using NH₃-TPD. ^b The acidity of the catalysts was tested by the gravimetric method using pyridine gas as a basic adsorbate.

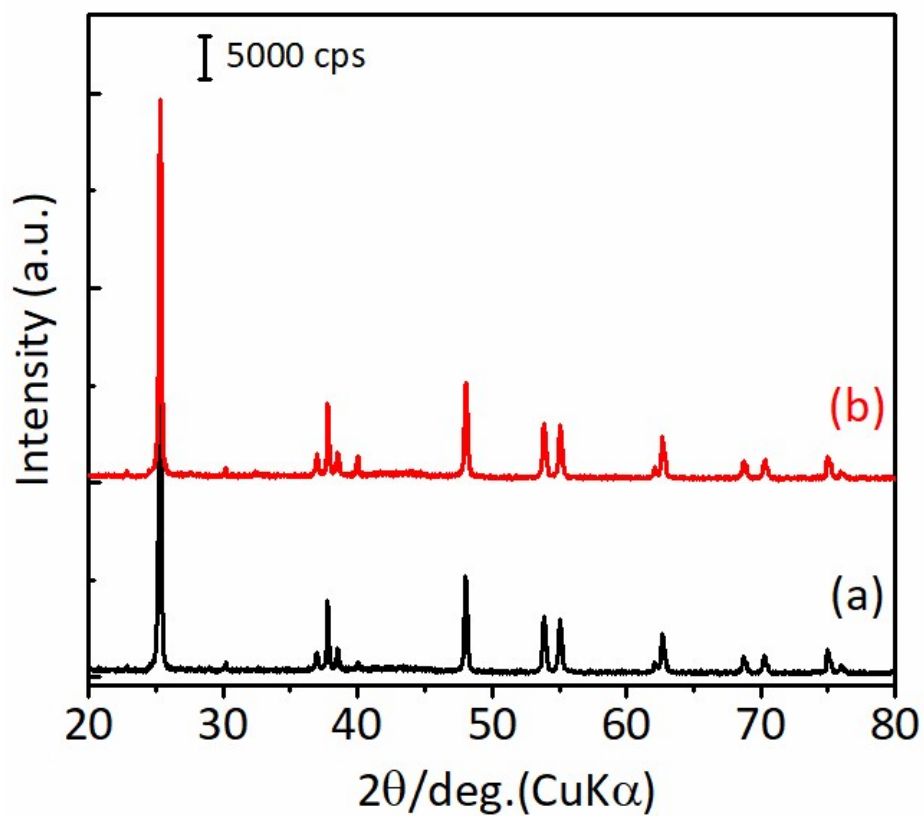


Fig. S6 XRD patterns of (a) fresh and (b) recovered Ru-(0.47)MoO_x/TiO₂ after the second reaction run.