Supporting Information

Selective hydrogenation of furfural to tetrahydrofurfuryl alcohol over Rh-loaded carbon catalyst in aqueous media under mild conditions

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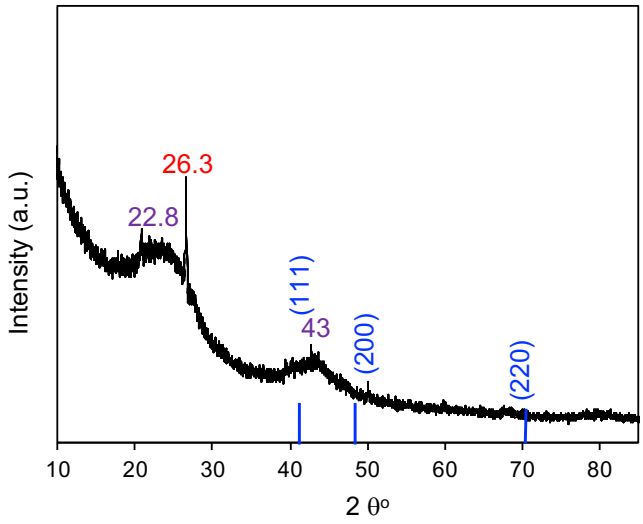


Fig. S1 XRD of Rh/C catalyst

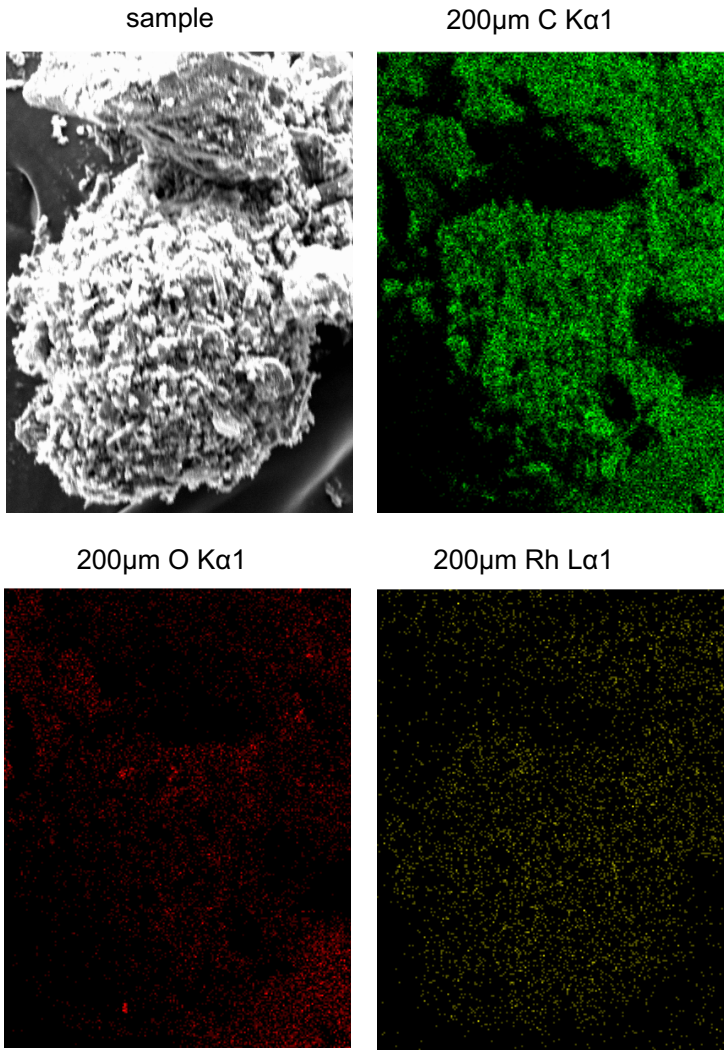


Fig. S2 TEM-EDS elemental mapping for Rh/C catalyst.

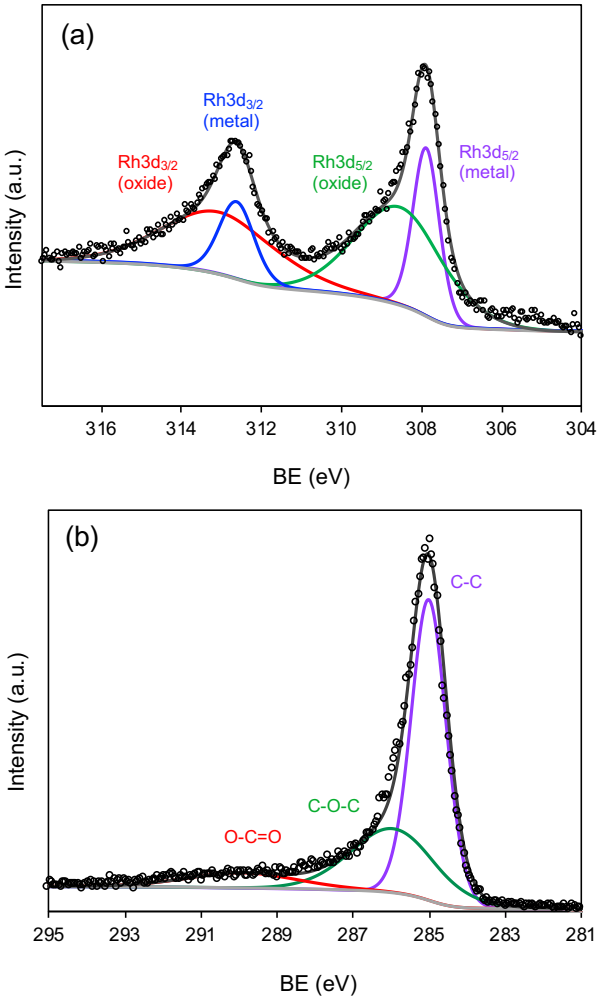
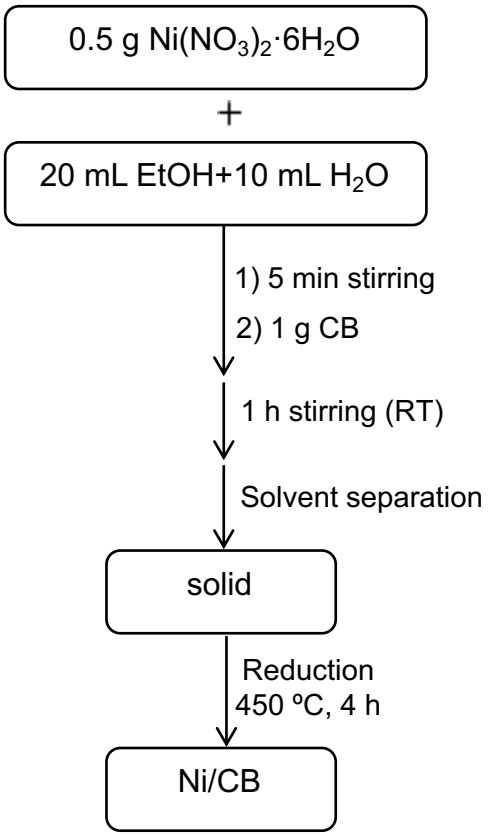
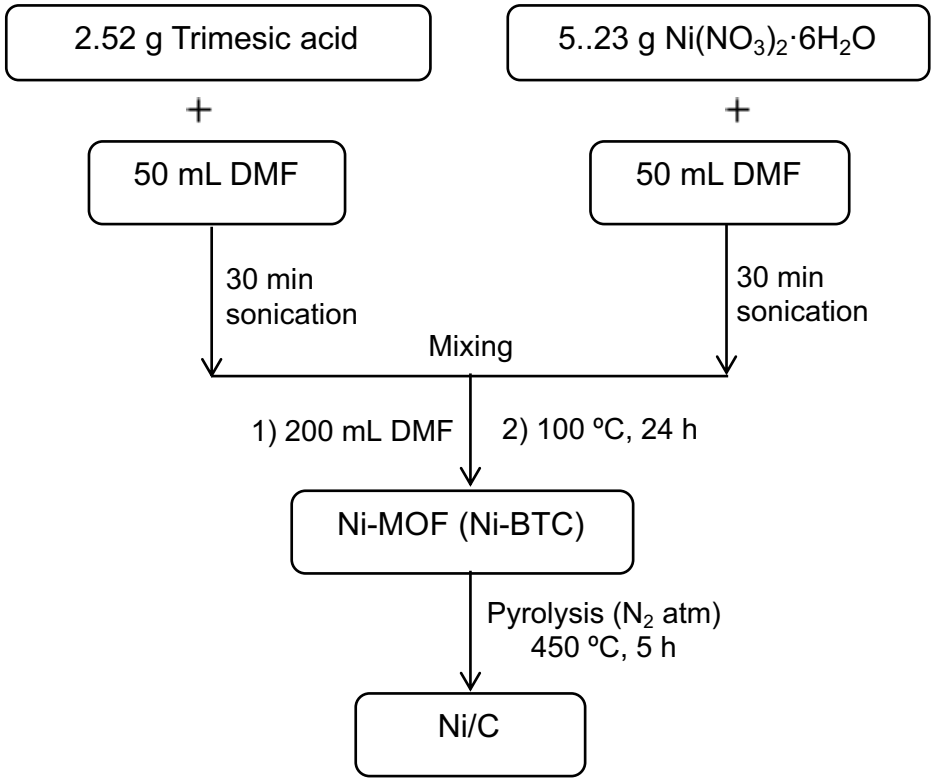


Fig. S3 (a) XPS of Rh 3d for Rh/C catalyst, (b) XPS of C 1s for Rh/C catalyst.



Scheme 1 Synthesis of Ni/CB. For the synthesis of Ni/AC AC was used instead of CB.



Scheme 2 Synthesis of Ni/C derived from Ni-MOF.

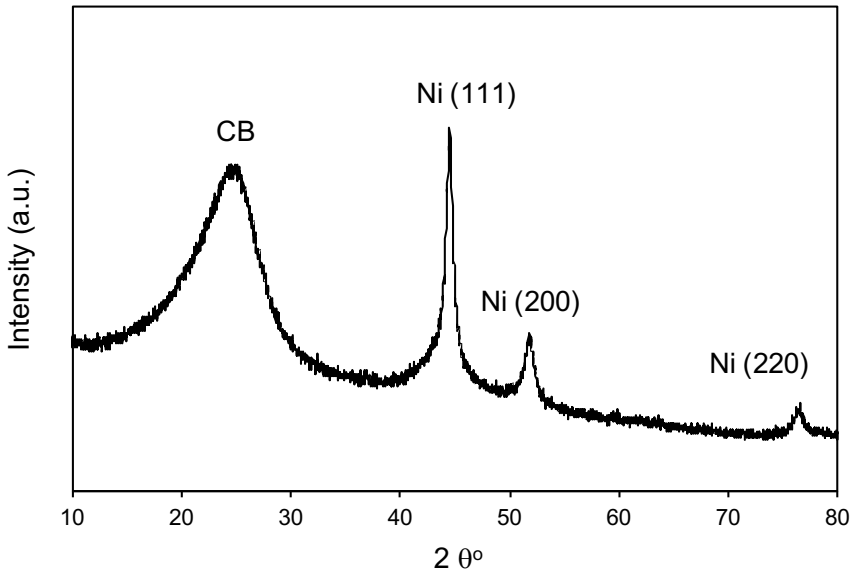


Fig. S4 XRD of Ni/CB catalyst after reduction at 450 ºC.

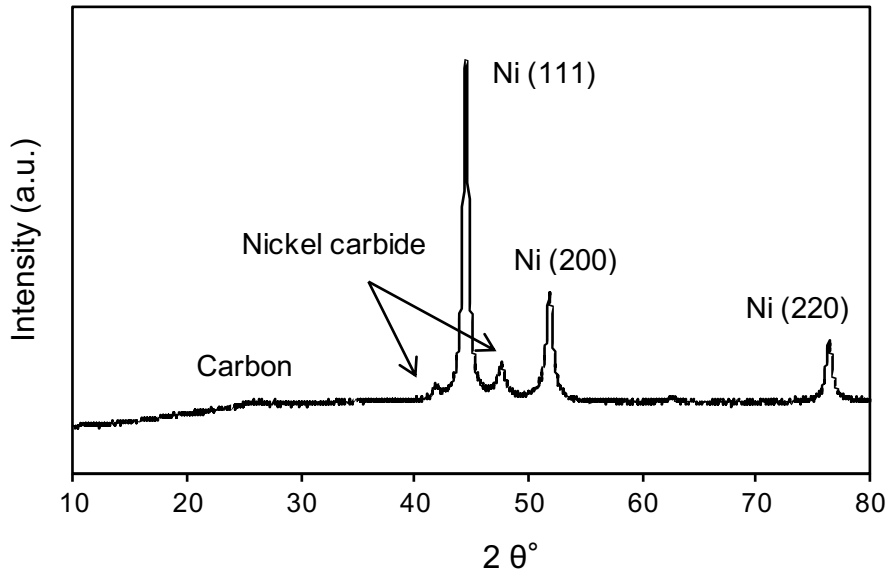


Fig. S5 XRD of Ni/C catalyst derived from Ni-MOF after reduction at 450 ºC.

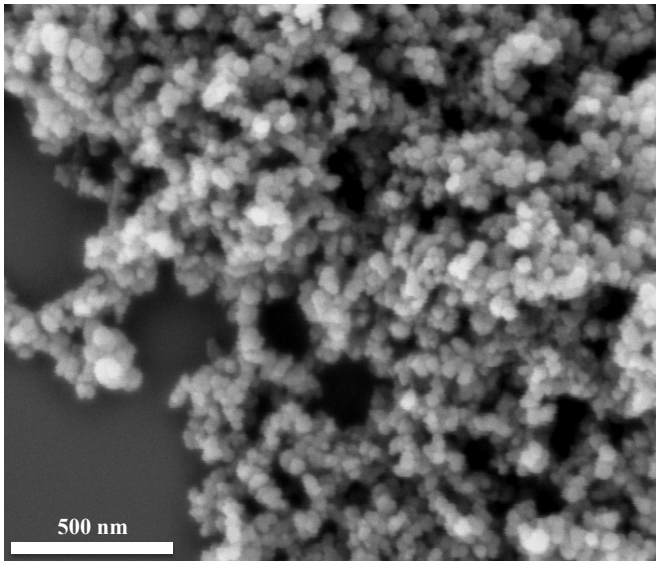


Fig. S6 SEM of Ni/CB catalyst.

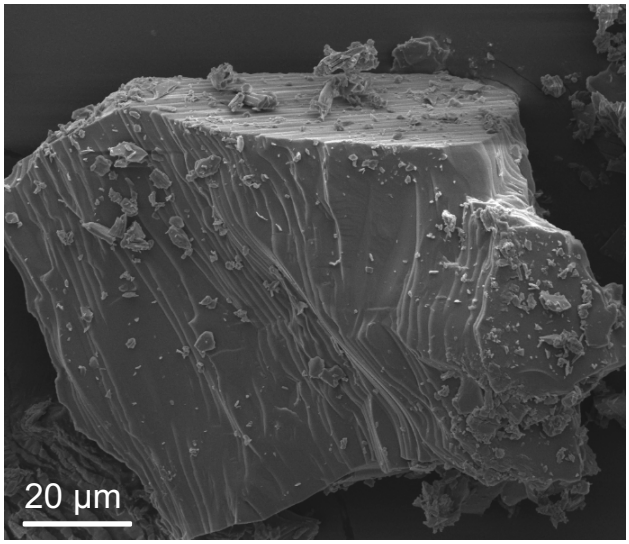


Fig. S7 SEM of Ni/C catalyst derived from Ni-MOF.

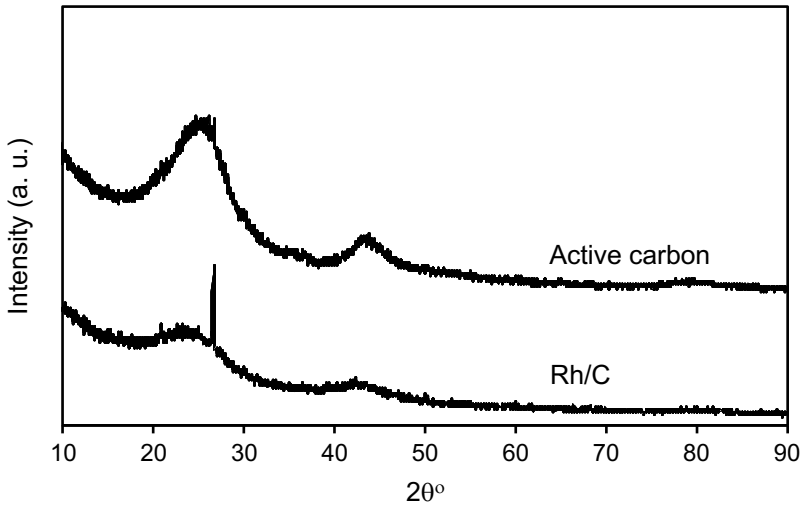


Fig. S8 XRD of Active carbon and Rh/C catalyst.

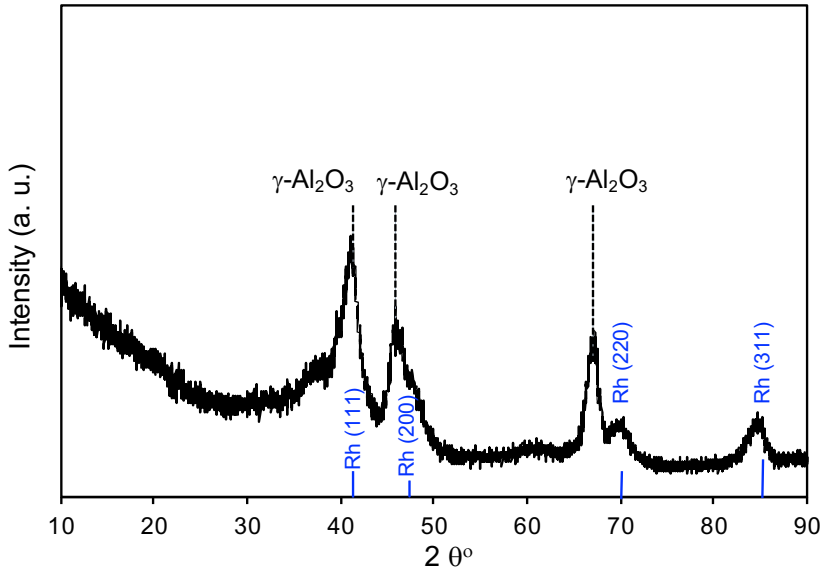


Fig. S9 XRD of Rh/Al_2O_3 catalyst.

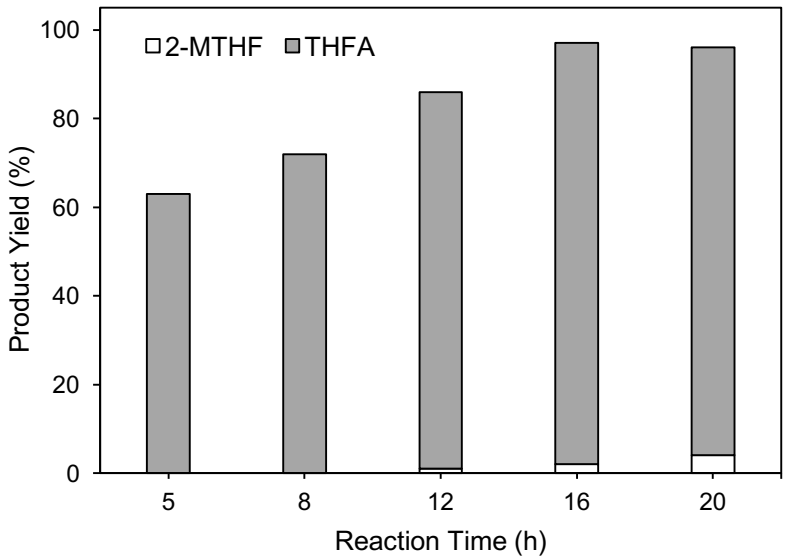


Fig. S10 Effect of reaction time on the FOL hydrogenation under ambient H_2 pressure. Reaction condition: FOL 12 mg, Rh/C 5 mg, DMA 5 mL, H_2 gas flow rate 30 mL min^{-1}, 30 ºC.

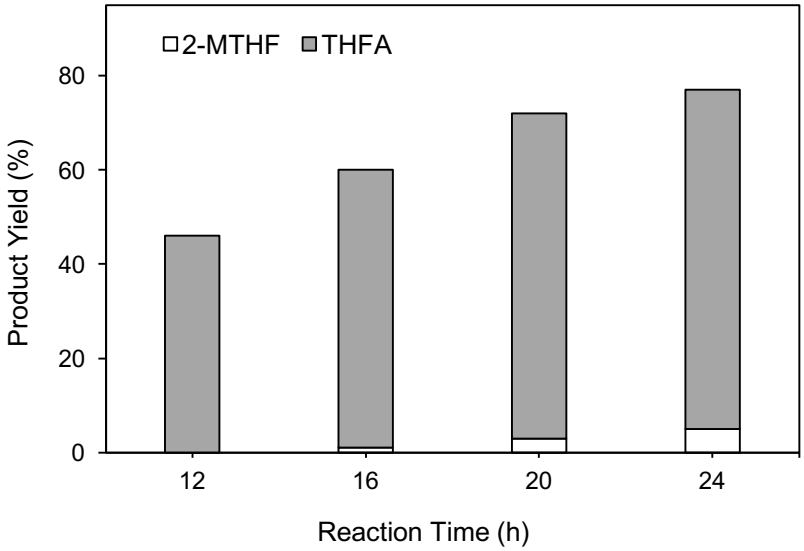


Fig. S11 Effect of reaction time on the FAL hydrogenation under ambient H_2 pressure. Reaction condition: FAL 23 mg, Rh/C 10 mg, DMA 10 mL, H_2 gas flow rate 30 mL min^{-1}, 30 ºC.

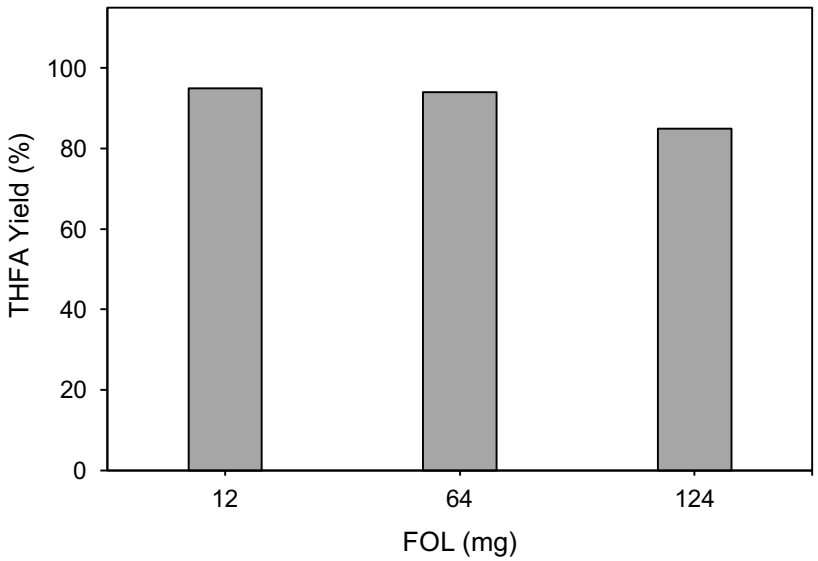


Fig. S12 Effect of substrate concentration on the FOL hydrogenation under ambient H_2 pressure. Reaction condition: Rh/C 5 mg, DMA 5 mL, H_2 gas flow rate 30 mL min^{-1}, 16 h.

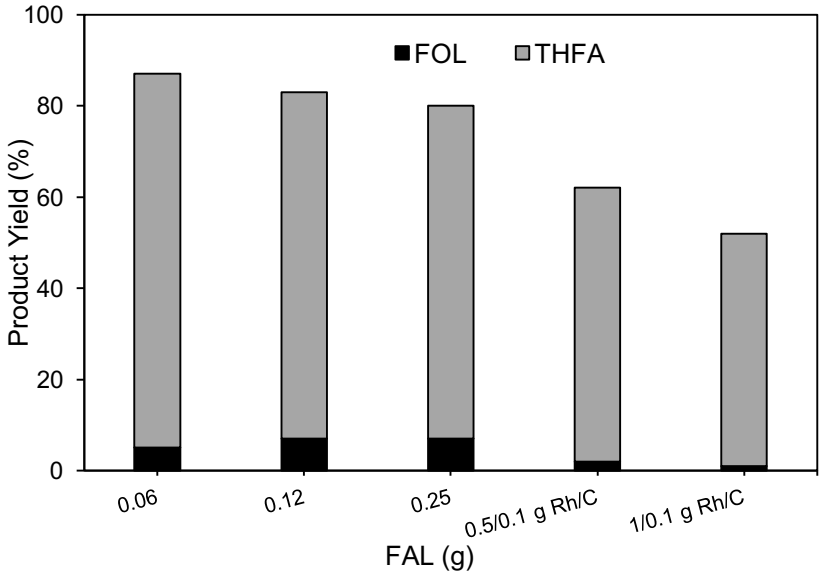


Fig. S13 Effect of substrate concentration on the FAL hydrogenation. Reaction condition: Rh/C 25 mg, H_2O 25 mL, H_2 pressure 1 MPa, 30 ºC, 8 h.

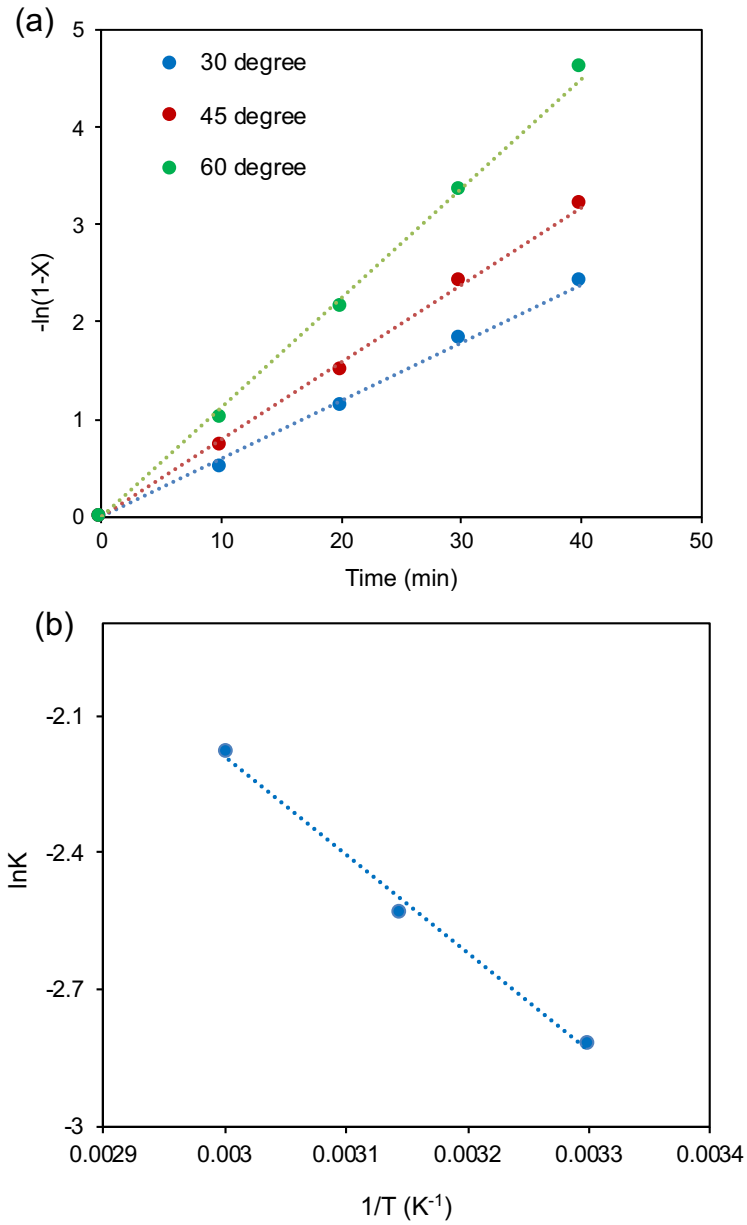


Fig. S14 (a) The rate constant for FAL hydrogenation into FOL, (b) Arrhenius plot for FAL hydrogenation into FOL. Reaction condition: FAL 60 mg, Rh/C 25 mg, water 25 mL, H_2 gas flow rate 30 mL min^{-1}.

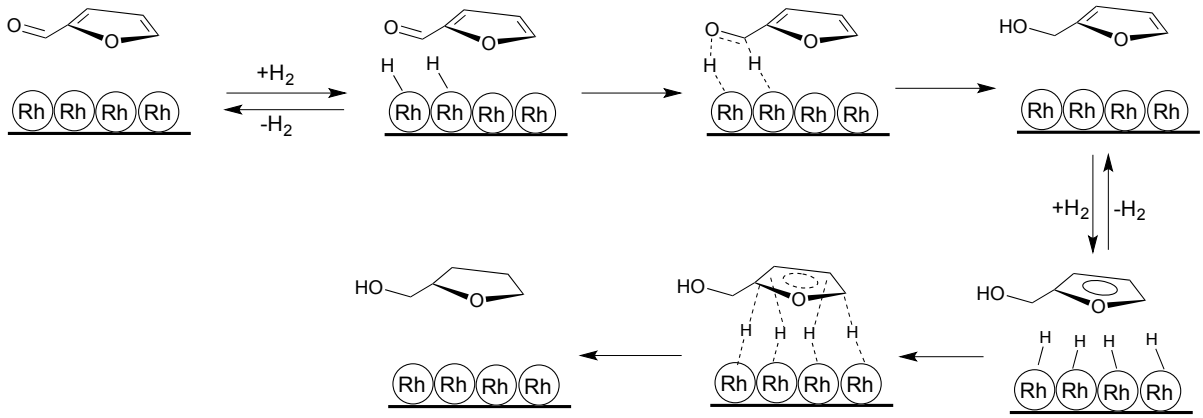


Fig. S15 Proposed mechanism for the hydrogenation of FAL into THFA over Rh/C catalyst.