

Supporting Information

$\text{Fe}_3\text{O}_4@$ HKUST-1 and $\text{Pd}/\text{Fe}_3\text{O}_4@$ HKUST-1 as magnetically recyclable catalysts prepared via conversion from a Cu-based ceramic

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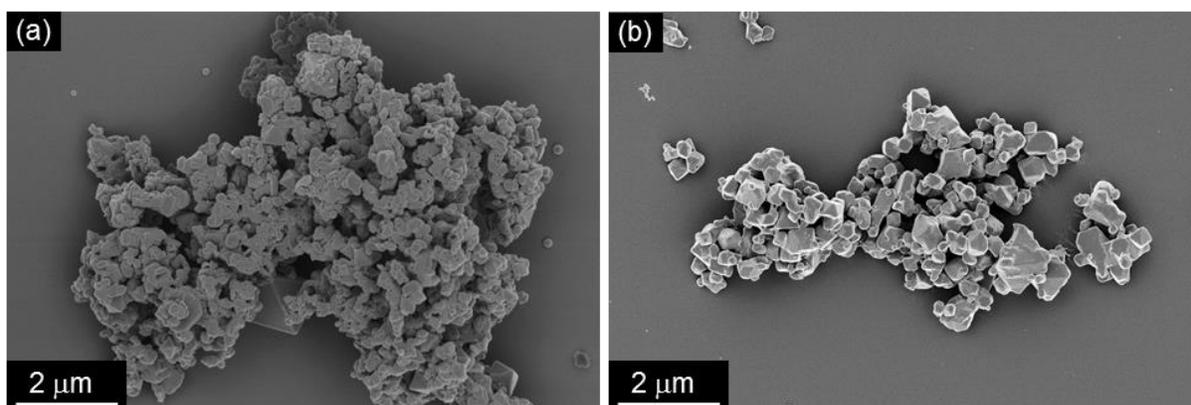


Figure S1. SEM images of materials after (a) 10 seconds and (b) 30 seconds of the conversion from $\text{Fe}_3\text{O}_4@\text{Cu}_2(\text{OH})_3\text{NO}_3$ into $\text{Fe}_3\text{O}_4@\text{HKUST-1}$.

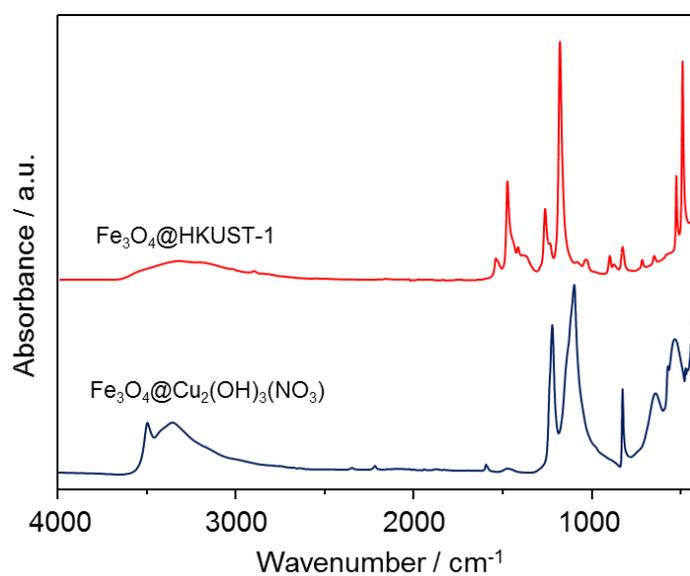


Figure S2. FT-IR spectra of $\text{Fe}_3\text{O}_4@\text{HKUST-1}$ and $\text{Fe}_3\text{O}_4@\text{Cu}_2(\text{OH})_3\text{NO}_3$.

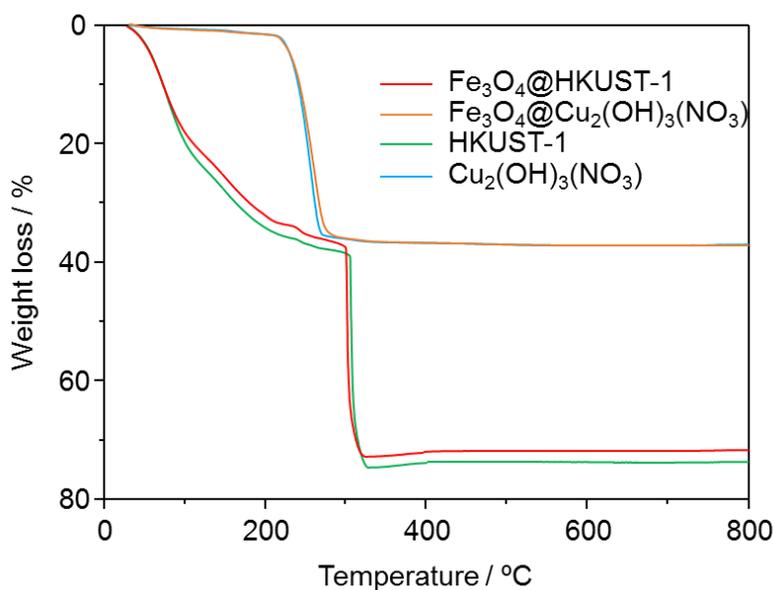


Figure S3. TGA curves of $\text{Fe}_3\text{O}_4\text{@HKUST-1}$, $\text{Fe}_3\text{O}_4\text{@Cu}_2(\text{OH})_3\text{NO}_3$, HKUST-1 and $\text{Cu}_2(\text{OH})_3\text{NO}_3$.

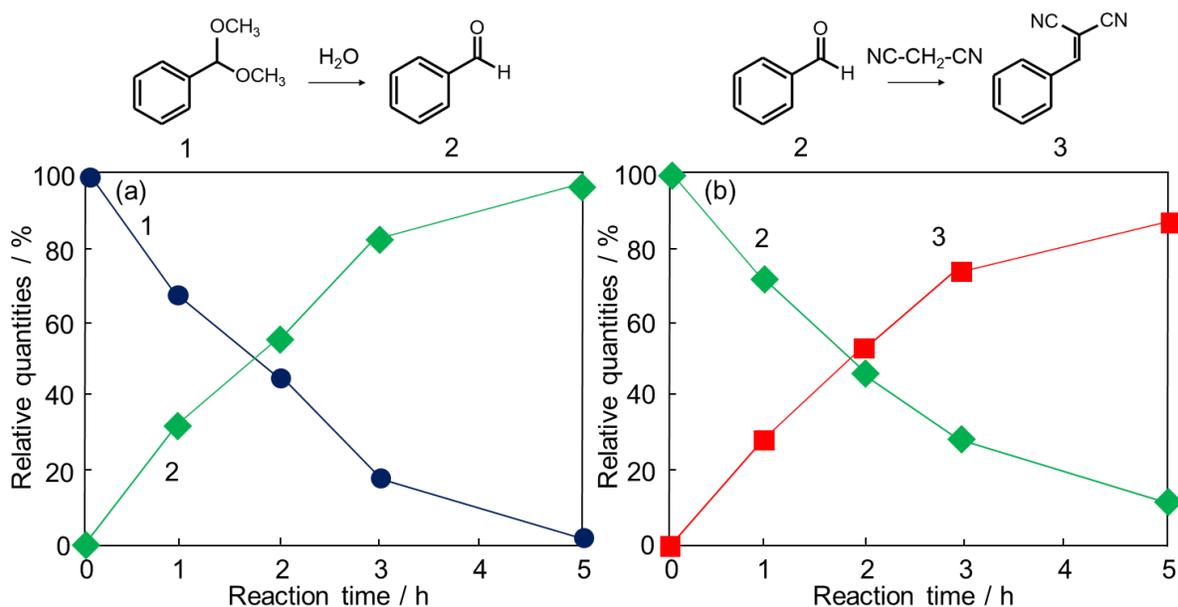


Figure S4. The results of (a) deacetalization and (b) Knoevenagel condensation using $\text{Fe}_3\text{O}_4\text{/HKUST-1}$ as a catalyst. Reaction conditions: (a) Catalyst (50 mg), benzaldehyde dimethylacetal (1 mmol), 1,4-dioxane (4 mL), 363 K, in air. (b) Catalyst (50 mg), benzaldehyde (1 mmol), malononitrile (3 mmol), 1,4-dioxane (4 mL), 363 K, in air.

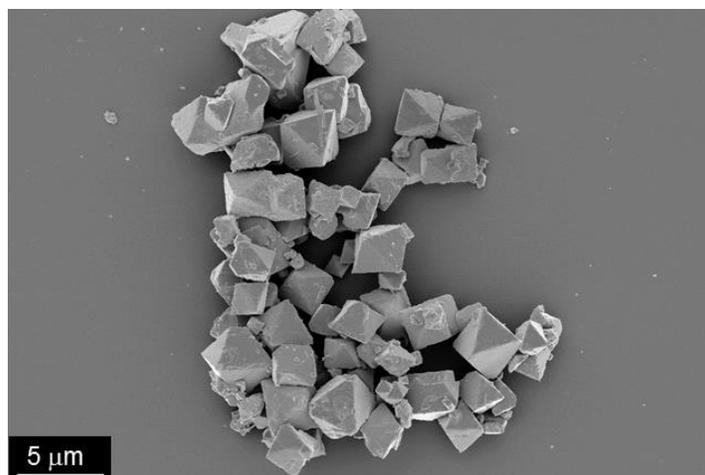


Figure S5. SEM image of HKUST-1_ref.

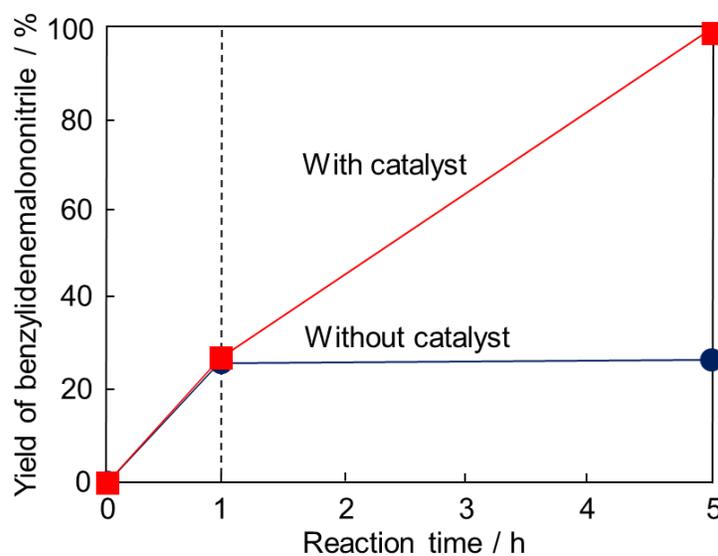


Figure S6. Leaching test for the one-pot deacetalization-Knoevenagel condensation reaction over $\text{Fe}_3\text{O}_4\text{@HKUST-1}$. After 0.5 h of the reaction time, the catalyst was filtrated. The reaction solution was further kept at reaction conditions without solid catalyst.

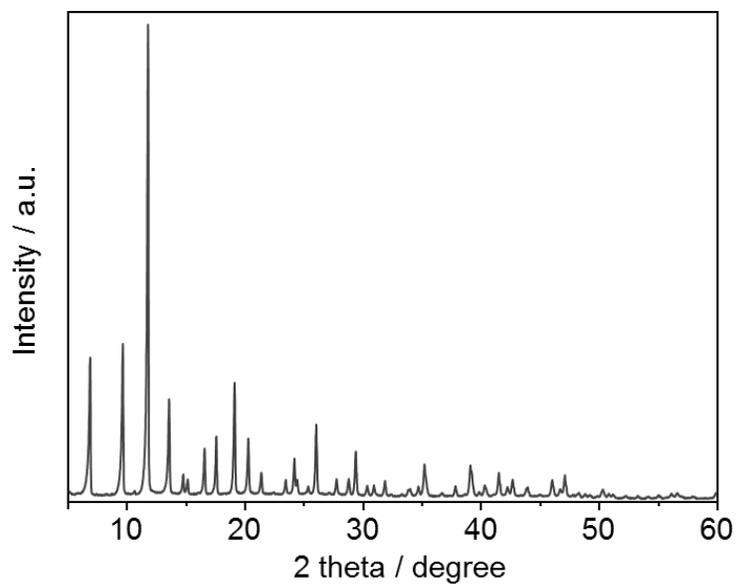


Figure S7. XRD pattern of Pd/Fe₃O₄@HKUST-1.

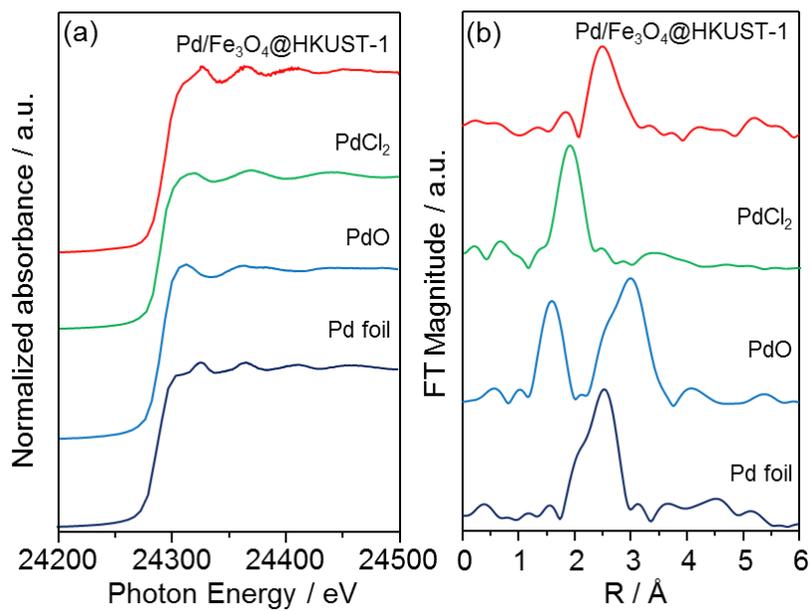


Figure S8. Pd K-edge (a) XANES and (b) FT-EXAFS spectra of Pd/Fe₃O₄@HKUST-1, PdCl₂, PdO and Pd foil.

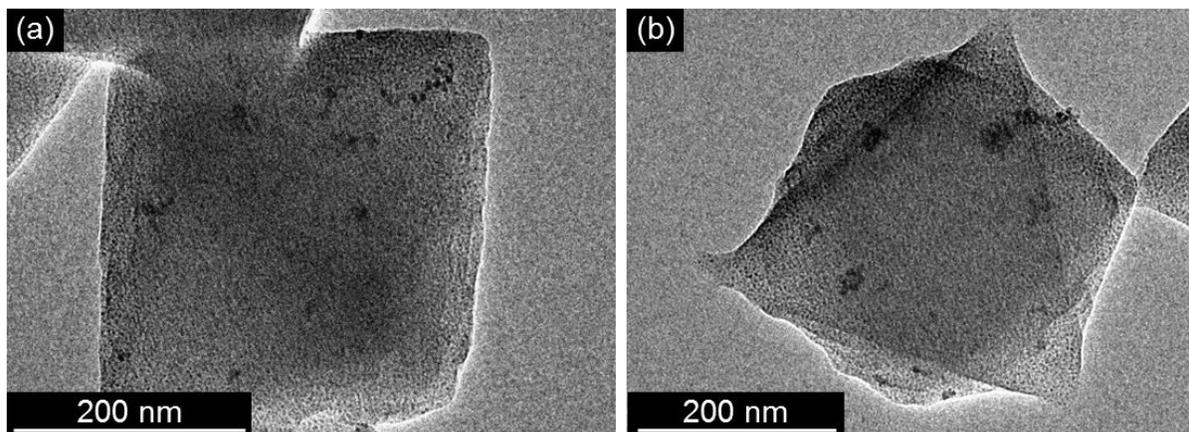


Figure S9. TEM images of (a) Pd/HKUST-1 and (b) Pd/Fe₃O₄@HKUST-1.

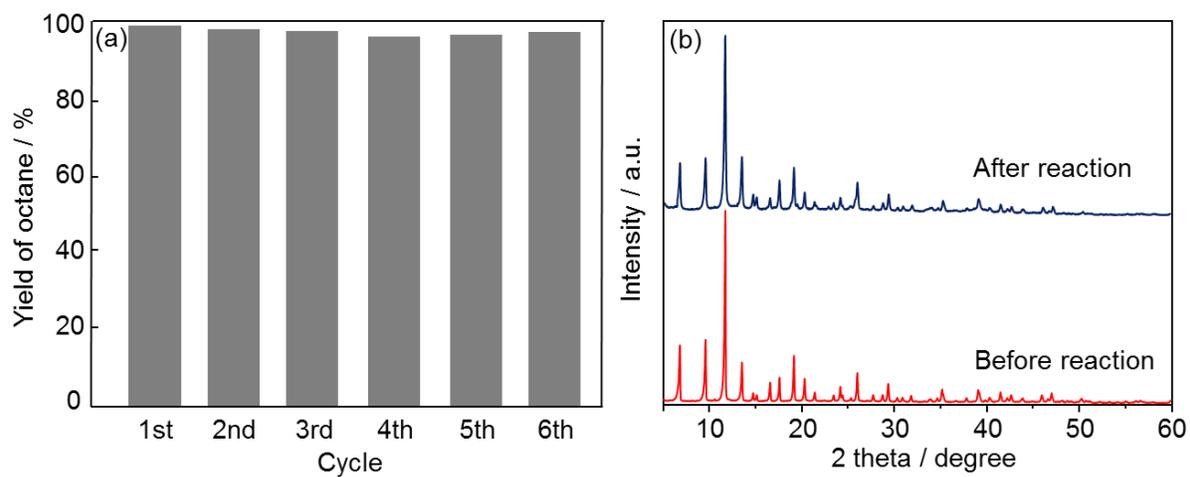


Figure S10. (a) Recycling tests for the hydrogenation of 1-octene to octane over Pd/Fe₃O₄@HKUST-1 and (b) XRD patterns of Pd/Fe₃O₄@HKUST-1 before and after the reaction.

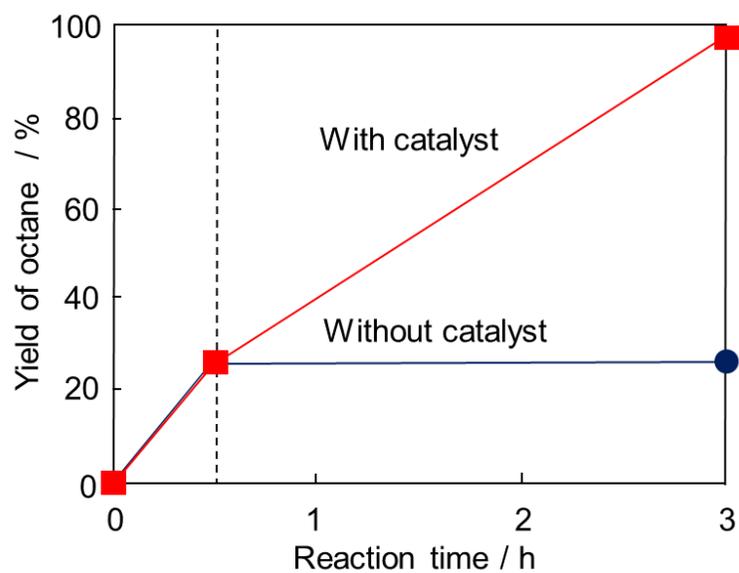


Figure S11. Leaching test for the hydrogenation of 1-octene over Pd/Fe₃O₄@HKUST-1. After 0.5 h of the reaction time, the catalyst was filtrated. The reaction solution was further kept at reaction conditions without solid catalyst.