Supporting Information

Metal-Organic Frameworks as the Efficient Pickering Interfacial Catalyst for Deacetalization-Knoevenagel Tandem Reaction

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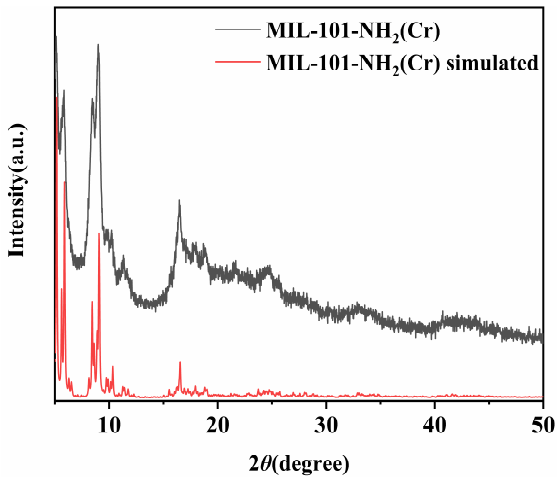


Figure S1. PXRD patterns of MIL-101(Cr)-NH_2, MIL-101(Cr)-NH_2 simulated.

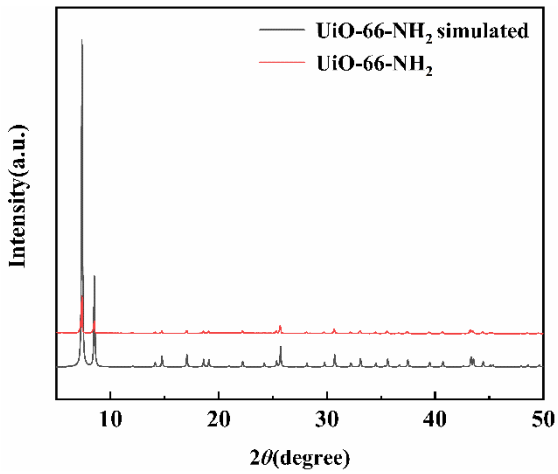


Figure S2. PXRD patterns of UiO-66(Zr)-NH_2, UiO-66(Zr)-NH_2 simulated.

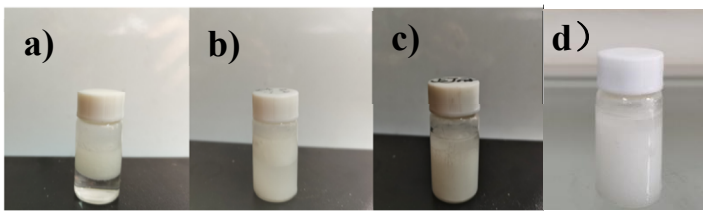


Figure S3. Photographs of Organic phase-water emulsions stabilized by 50mg ZIF-8: The vial contains (a) 2 mL of cyclohexane and 3 mL of water ;(b) 2 mL of n-hexane and 3 mL of water; (c)2 mL n-butanol of and 3 mL of water. （d）2 mL toluene of and 3 mL of water.

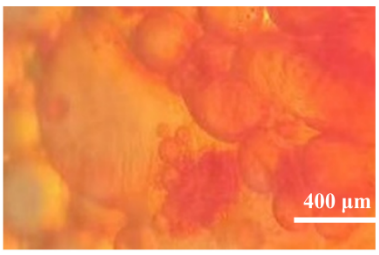


Figure S4. Optical microscope images of the 40 mg ZIF-8 stabilized Pickering emulsion with a water-to-toluene ratio of 3:2 and the emulsion stained with Rhodamine B and methyl red.

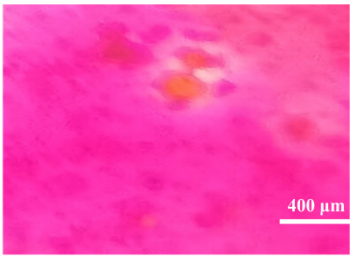


Figure S5. Optical microscope images of the 60 mg ZIF-8 stabilized Pickering emulsion with a water-to-toluene ratio of 3:2 and the emulsion stained with Rhodamine B and methyl red.

Figure S6. Photographs of the toluene-water emulsion stabilized by 50 mg ZIF-8(photograph was taken after standing for 3 weeks).

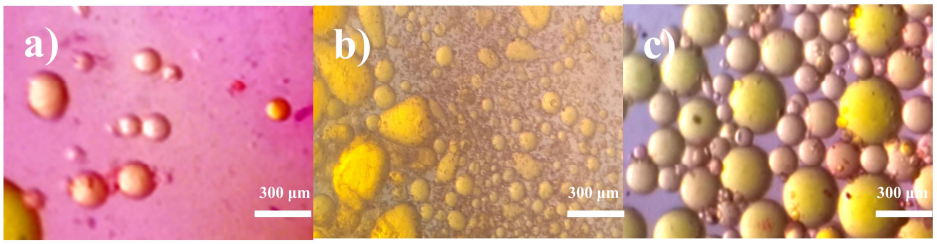


Figure S7. Optical microscope images of 50 mg MIL-101(Cr)-NH_2 stabilized Pickering emulsions stained with Rhodamine B and methyl red with different water-to-toluene ratios of (a) 3:2 (b) 1:1 and (c) 2:3.

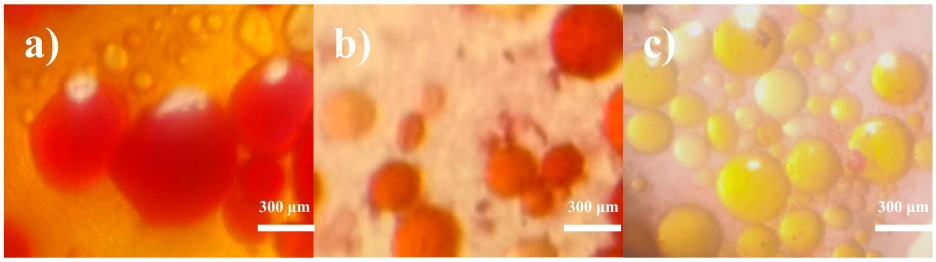


Figure S8. Optical microscope images of 50 mg UiO-66(Zr)-NH_2 stabilized Pickering emulsions stained with Rhodamine B and methyl red with different water-to-toluene ratios of (a) 3:2 (b) 1:1 and (c) 2:3.

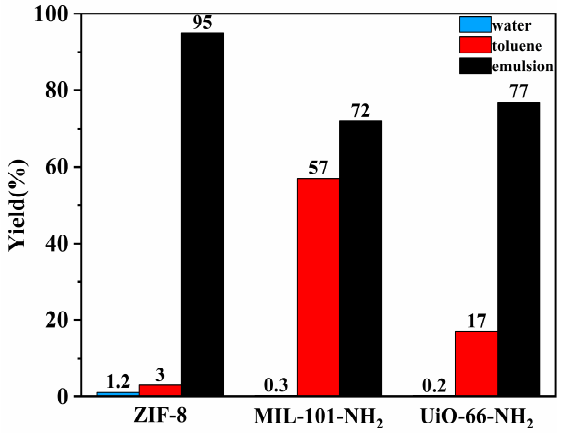


Figure S9. The yield of deacetalization-Knoevenagel reaction by ZIF-8, UiO-66(Zr)-NH_2, and MIL-101(Cr)-NH_2 in water, toluene, and emulsion respectively. Reaction conditions: benzaldehyde dimethyl acetal (1 mmol) and malononitrile (1.5 mmol), 5.0 mL Pickering emulsion (3 mL water, 2 mL toluene), reaction time (6 h), reaction temperature: 353 K, catalyst (50 mg). The yield was determined by GC.

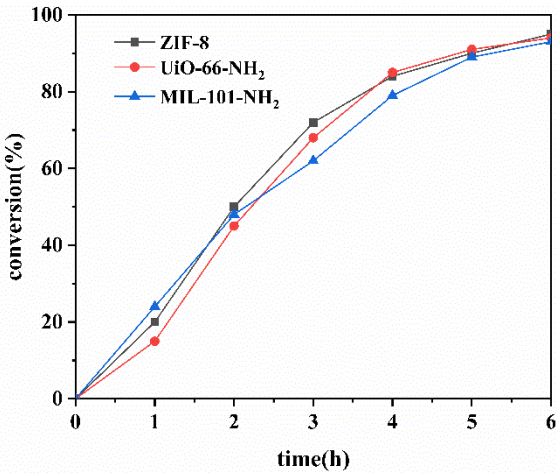


Figure S10. Time conversion diagrams for the catalytic deacetalisation-Knoevenagel tandem reactions of ZIF-8, UiO-66-NH_2 and MIL-101-NH_2 in their respective optimum water-to-oil ratio emulsions.

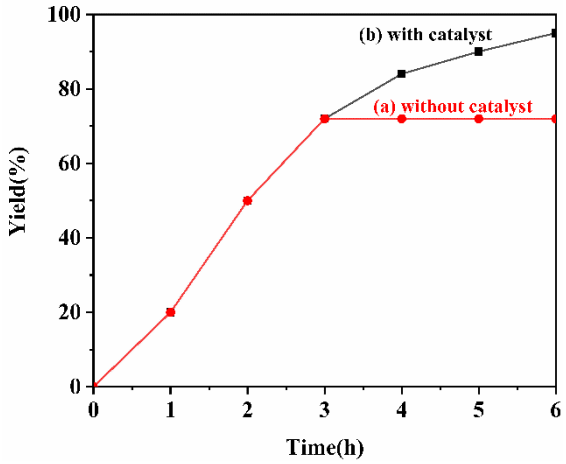


Figure S11. Hot filtration tests of the ZIF-8 catalyst for deacetalization-Knoevenagel tandem reaction: (a) catalyst was filtered out after the reaction lasted for 3 hours. (b) Normal reaction process.

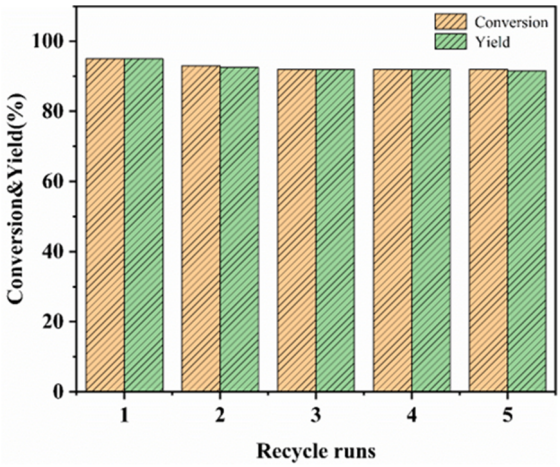


Figure S12. Recycle tests of ZIF-8 for deacetalization-Knoevenagel tandem reaction.

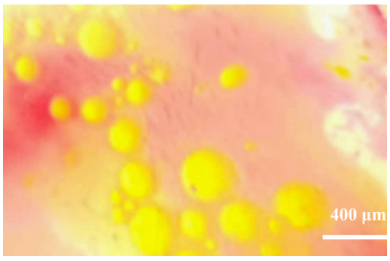
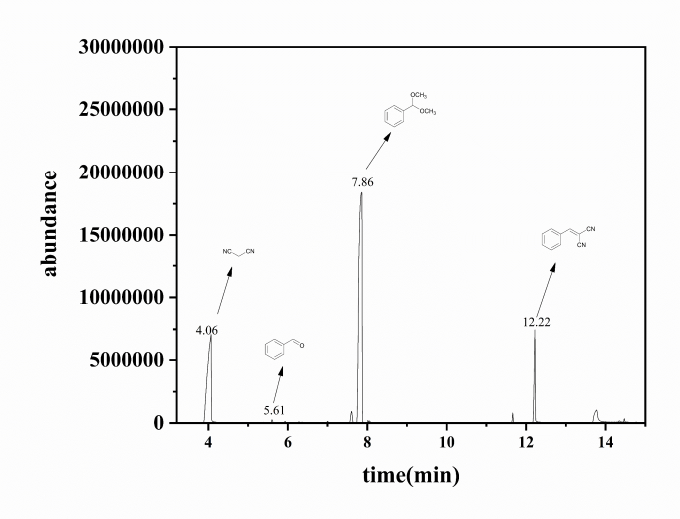


Figure S13. Optical microscope images of water (3 mL)-toluene (2 mL) emulsion stabilized by 50 mg ZIF-8 after the fifth catalytic run.



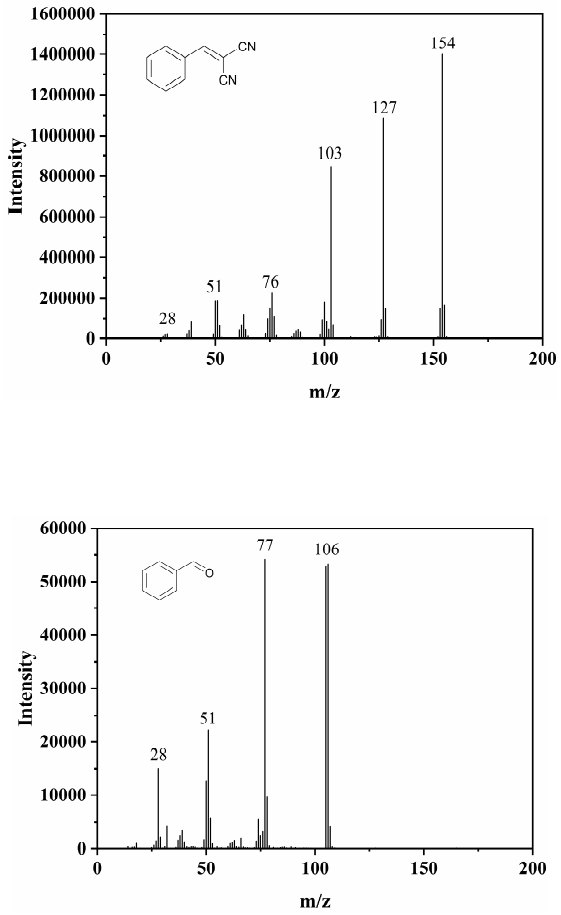


Figure S14. GC-MS spectrum of products after 2 hours of deacetalization-Knoevenagel tandem reaction by ZIF-8 in the emulsion.

Table S1. The surface areas, pore volumes, and pore sizes of the as-prepared catalysts**.**

Catalyst	S_{BET} (m^2/g) [a]	V_{pore} (cm^3/g) [b]	Pore size (nm) [c]
MIL-101(Cr)-NH_2	1990	1.61	3.24
UiO-66(Zr)-NH_2	1044	0.72	2.76
ZIF-8	1211	0.65	2.14

[a]Specific surface area was measured by the BET method.

[b]Total pore volume

[c]Pore size determined by the BET method