

Supporting Information

Sonochemical Synthesis of MOF-235 and Polyvinylpyrrolidone (PVP)-Assisted Phase Transformation to MIL-53(Fe)

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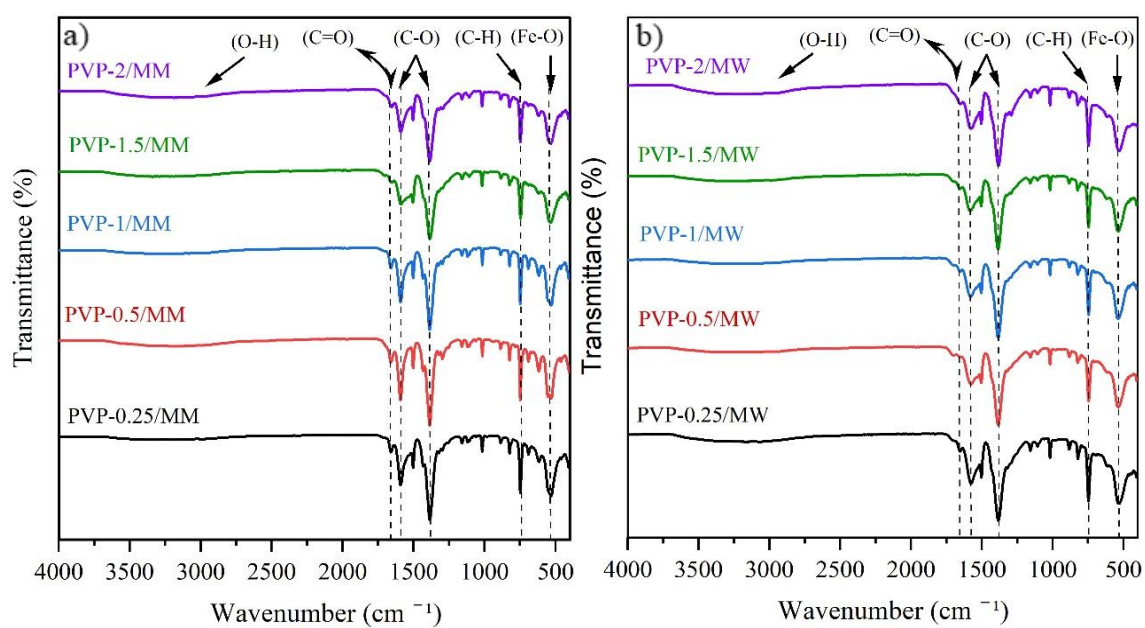


Fig. S1 FTIR spectra of MOF samples synthesized by 6 hours using an ultrasound probe at a constant temperature of 70°C . Post-synthesis treatment with a) Methanol and b) Methanol Water for 0.25, 0.5, 1, 1.5, and 2 molar ratios of PVP.

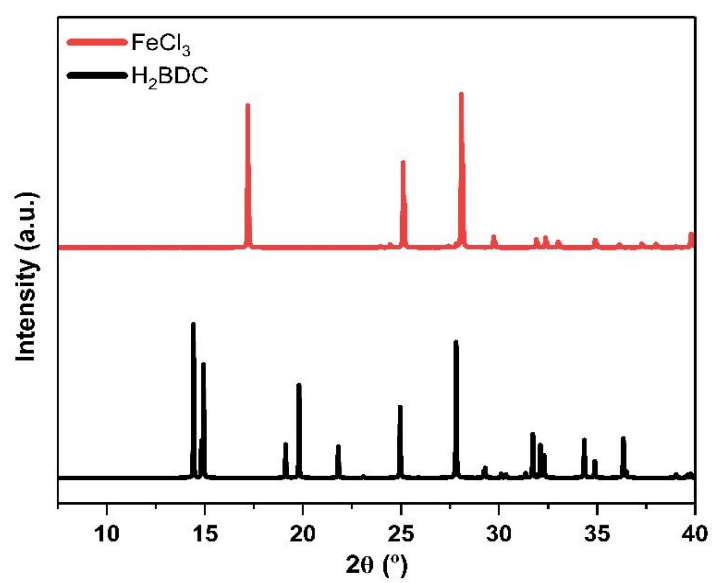


Fig. S2 The patterns for H_2BDC , and FeCl_3 were calculated from CIF files obtained from the Cambridge Crystallographic Data Centre (CCDC).^{1,2}

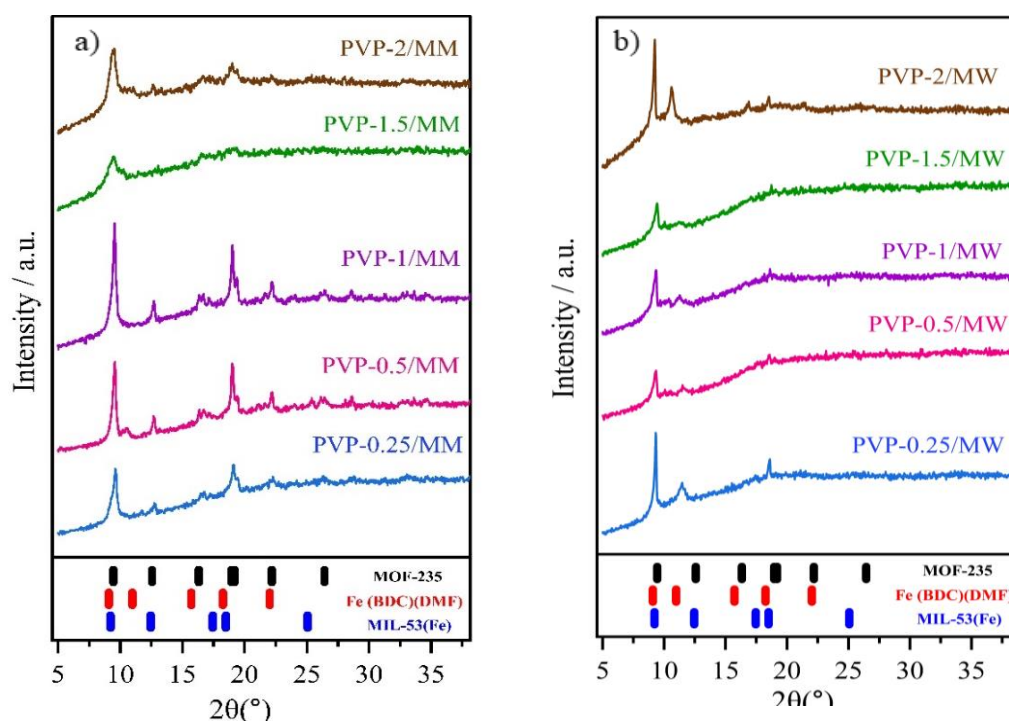


Fig. S3 XRD patterns of MOF samples synthesized by 6 hours under ultrasound reaction with the 0.25, 0.5, 1, 1.5, and 2 molar ratios of PVP at a constant temperature of 70°C and post-synthesis treatment by a) Methanol and b) Methanol Water. The final Rietveld plot is calculated from CIF files of MOF-235 and two different crystal phases of MIL-53(Fe).³⁻⁵

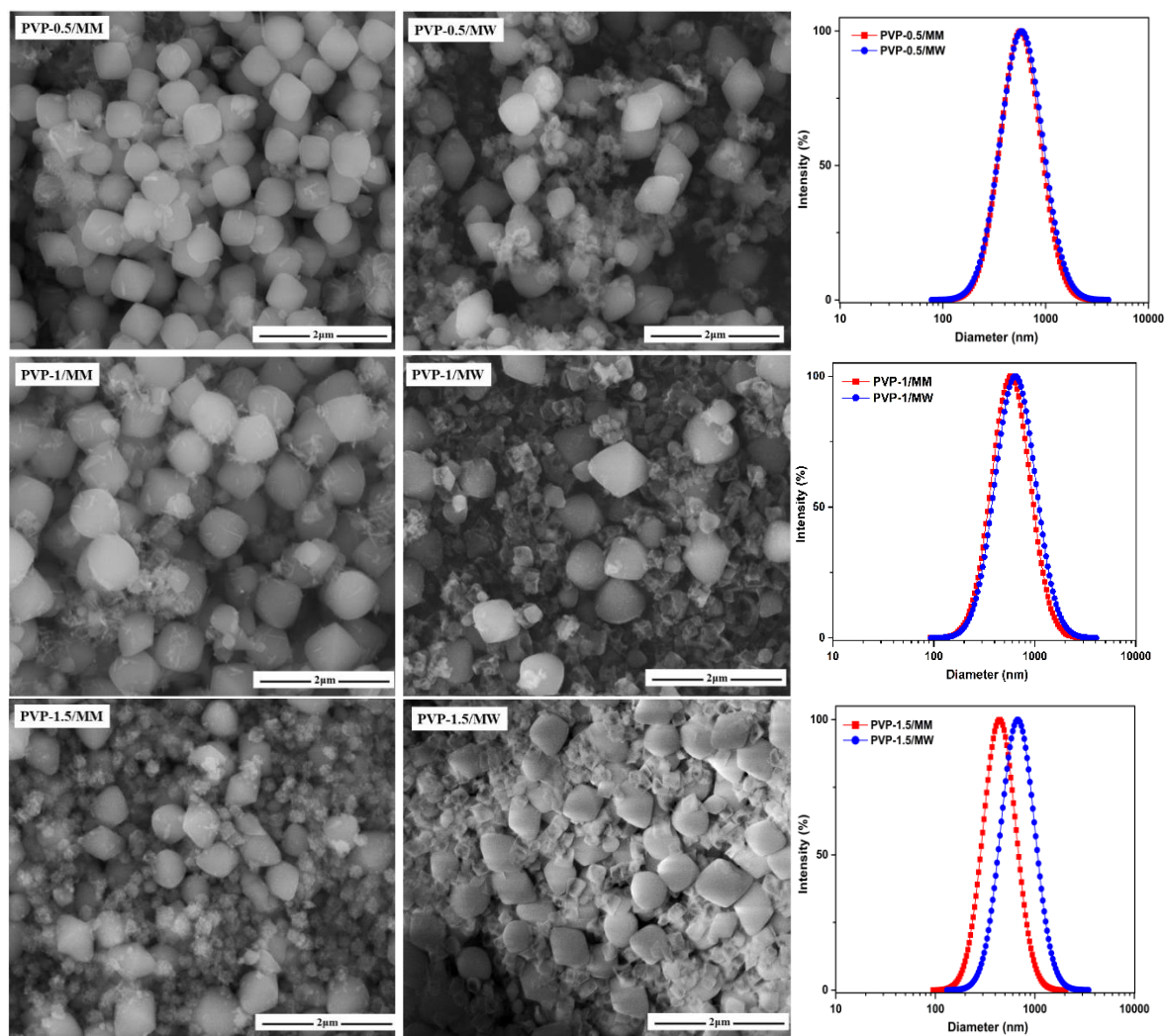


Fig. S4 SEM images and particle size distribution of the samples synthesized by 6 hours under ultrasound reaction with the 0.5, 1, and 1.5 molar ratios of PVP at a constant temperature of 70°C and post-synthesis treatment by MM) Methanol and MW) Methanol Water.

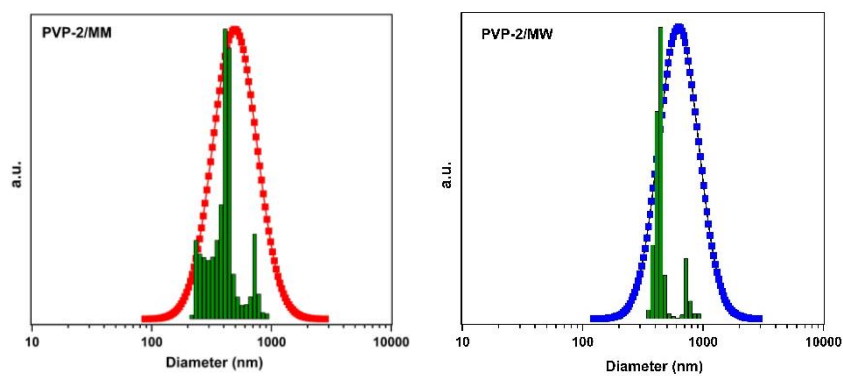


Fig. S5 Size distribution of PVP-2/MM and PVP-2/MW samples by DLS measurements. Lognormal distribution with intensity (squares) and multimodal with numbers (bars)).

Table S1 Table of Polydispersity Index (PDI) measured by DLS

Sample	PDI	Sample	PDI
PVP-0/MM	0.268	PVP-0/MW	0.271
PVP-0.25/MM	0.248	PVP-0.25/MW	0.138
PVP-0.5/MM	0.220	PVP-0.5/MW	0.250
PVP-1/MM	0.212	PVP-1/MW	0.235
PVP-1.5/MM	0.152	PVP-1.5/MW	0.164
PVP-2/MM	0.196	PVP-2/MW	0.157

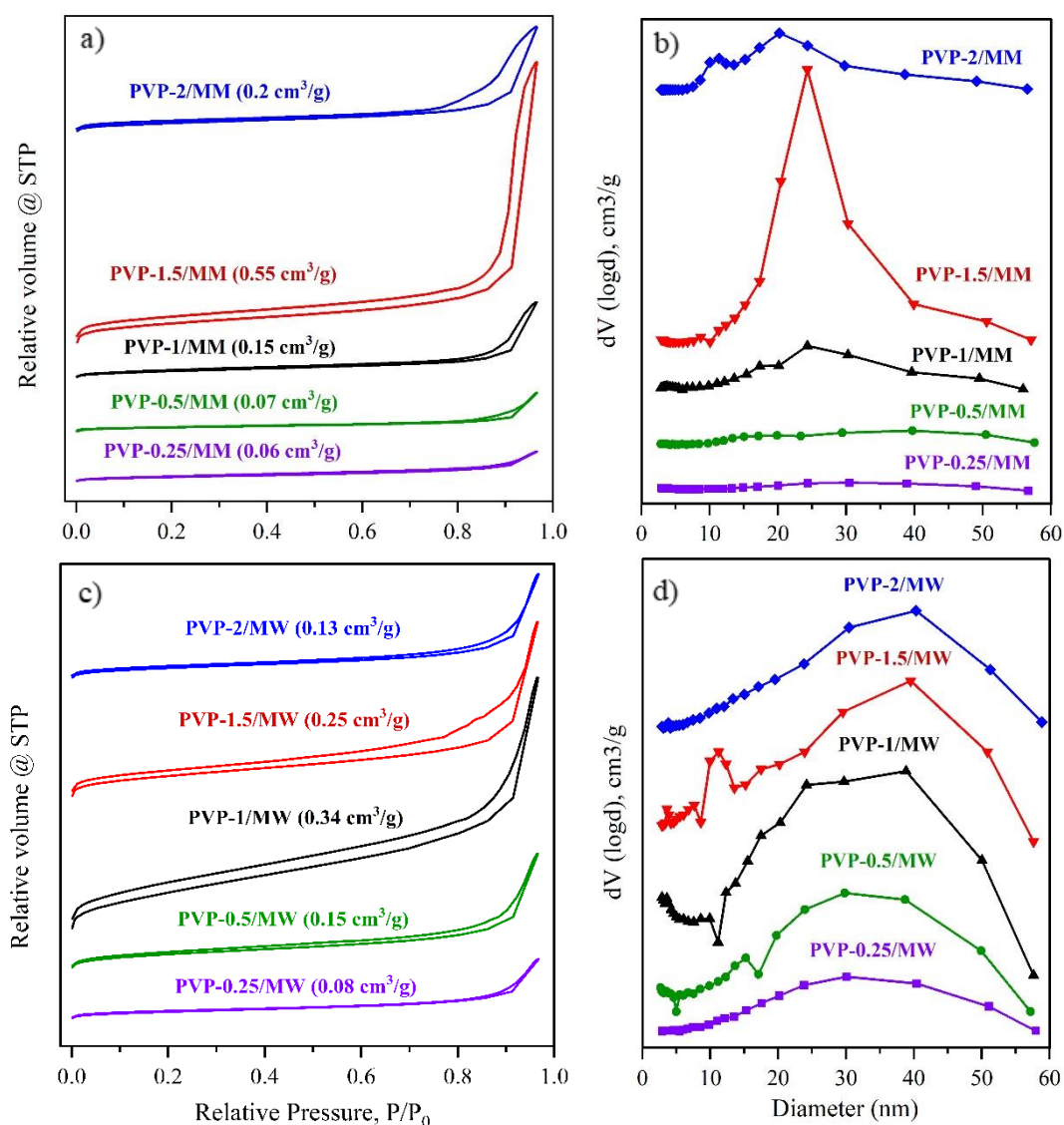


Fig. S6 The nitrogen adsorption-desorption isotherm and BJH pore size distribution of the samples synthesized by 6 hours under ultrasound reaction with 0.25, 0.5, 1, 1.5, and 2 molar ratios of PVP at a constant temperature of 70°C and post-synthesis treatment by a-b) Methanol and c-d) Methanol Water. The total pore volume is shown between parentheses.

References:

- 1 M. Bailey and C. J. Brown, *urn:issn:0365-110X*, 1967, **22**, 387–391.
- 2 M. D. Lind, *J Chem Phys*, 1967, **47**, 990–993.
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- 4 T. R. Whitfield, X. Wang, L. Liu and A. J. Jacobson, *Solid State Sci*, 2005, **7**, 1096–1103.
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