Supporting Information

CO_2-Switchable amidine-modified ZIF-90 stabilized Pickering emulsions for controllable Knoevenagel condensation reaction

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Number of pages: 12
Number of figures: 26

Figures S1-S26

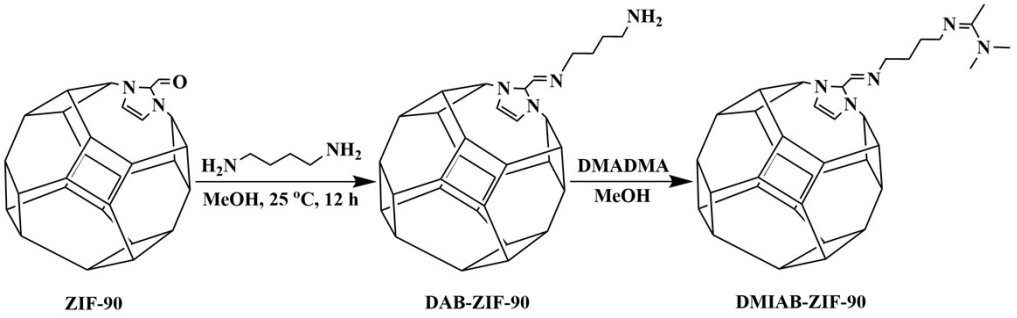

Figure S1 General procedure for the preparation of the amidine-modified ZIF-90.

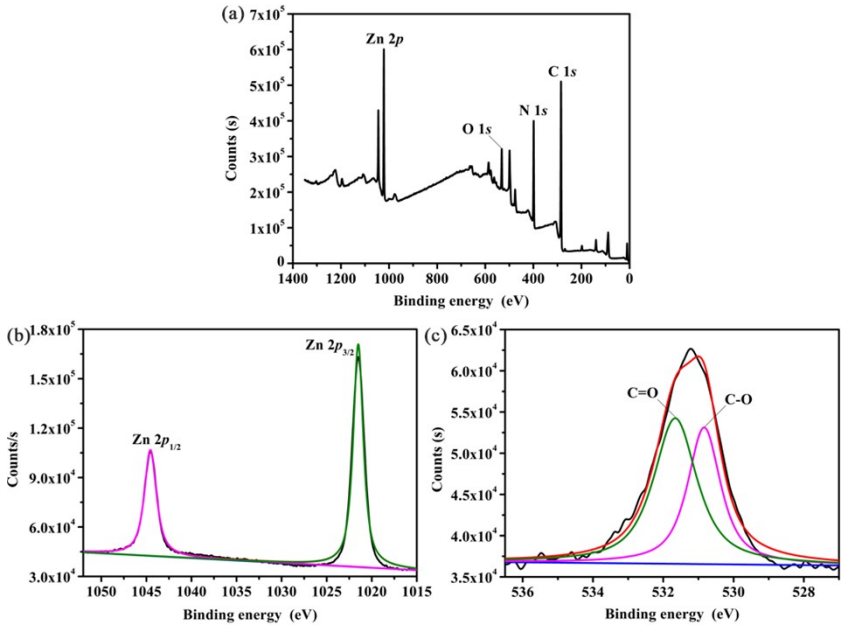

Figure S2 XPS spectra (a), high-resolution XPS spectra of N 1*s* (b) and O 1*s* (c) for DMIAB-ZIF-90.

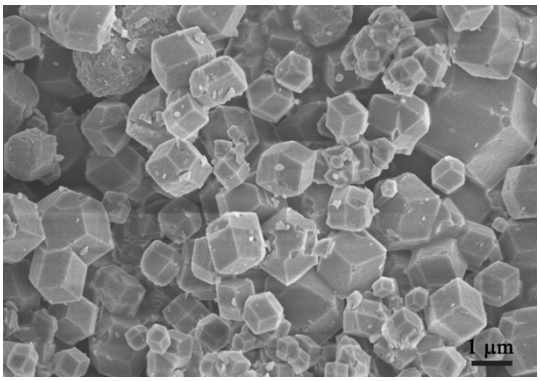

Figure S3 SEM image of the original ZIF-90.

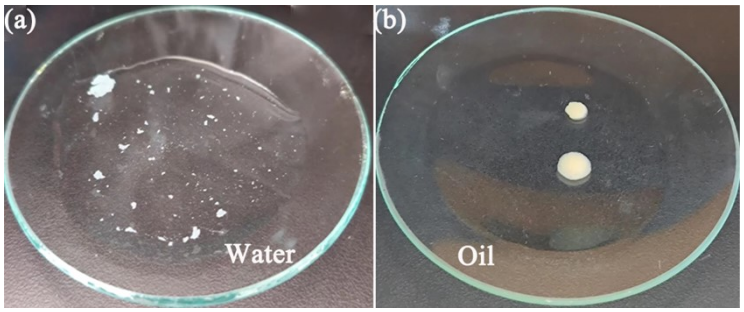

Figure S4 Photographs of the appearance of emulsion droplets in water and cyclohexane: (a) the DMIAB-ZIF-90-stabilized Pickering emulsion droplet dispersed in water, and (b) the emulsion droplet dispersed in cyclohexane.

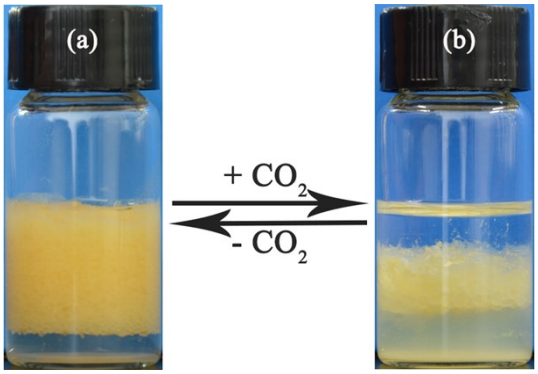

Figure S5 Photographs of the reversible switching between emulsification (a) and demulsification (b) of DMIAB-ZIF-90-stabilized Pickering emulsions ($V_{benzene}/V_{water}$ = 3: 2) driven by CO_2.

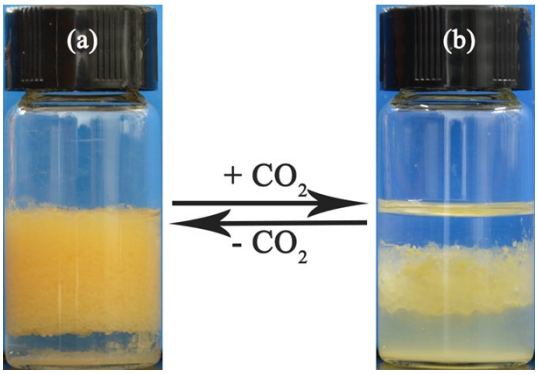

Figure S6 Photographs of the reversible switching between emulsification (a) and demulsification (b) of DMIAB-ZIF-90-stabilized Pickering emulsions ($V_{toluene}/V_{water}$ = 3: 2) driven by CO_2.

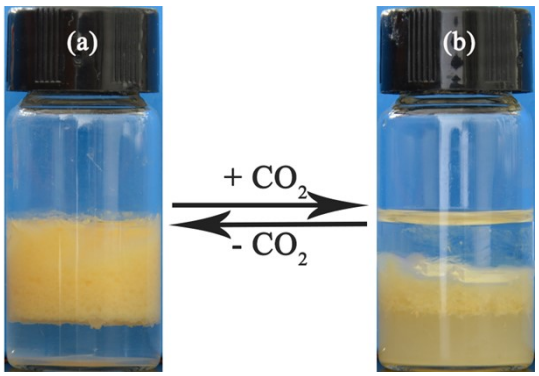

Figure S7 Photographs of the reversible switching between emulsification (a) and demulsification (b) of DMIAB-ZIF-90-stabilized Pickering emulsions ($V_{\text{n-hexane}}/V_{\text{water}}$ = 3: 2) driven by CO_2.

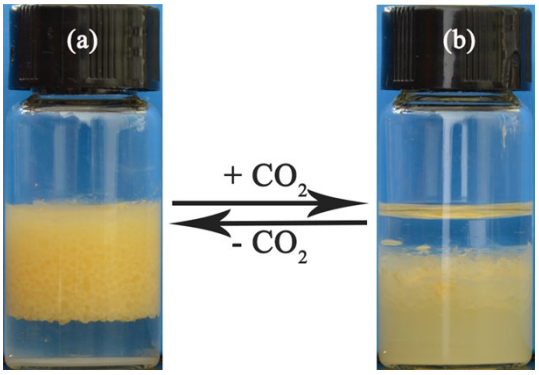

Figure S8 Photographs of the reversible switching between emulsification (a) and demulsification (b) of DMIAB-ZIF-90-stabilized Pickering emulsions ($V_{\text{n-heptane}}/V_{\text{water}}$ = 3: 2) driven by CO_2.

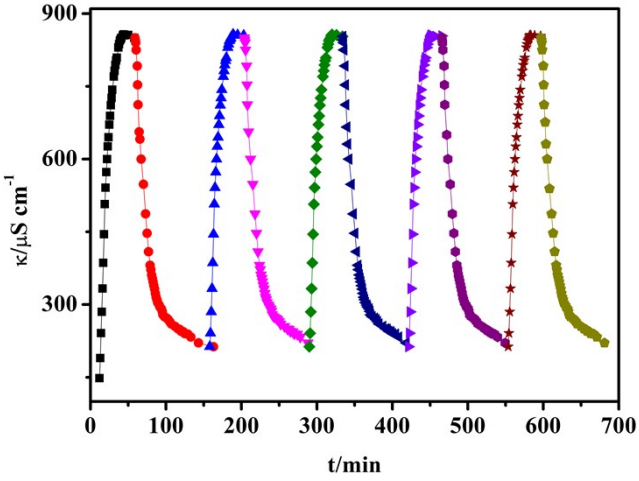

Figure S9 Conductivity of 1 wt% DMIAB-ZIF-90 dispersed in water as a function of time by alternating treatment with CO_2 and N_2.

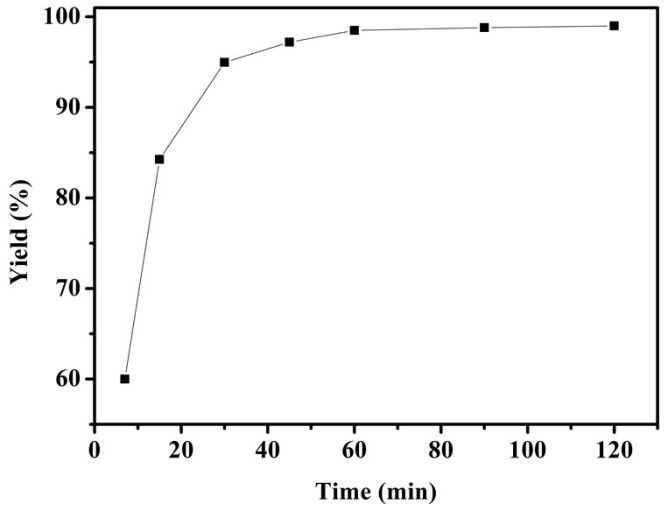

Figure S10 The variation of 2-benzylidenemalononitrile yield with reaction time in DMIAB-ZIF-90-based Pickering emulsion at 25 °C.

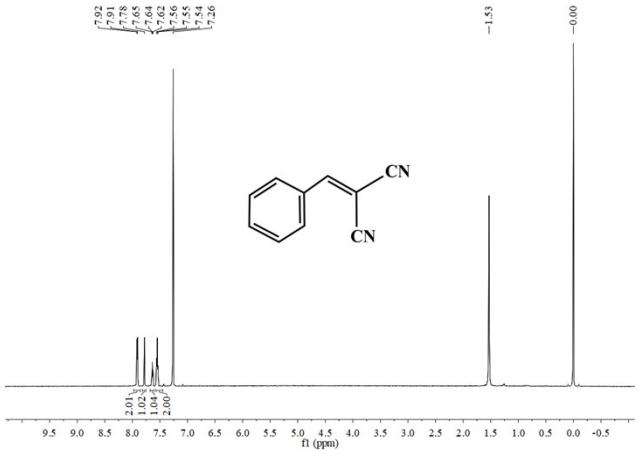

Figure S11 ^{1}H NMR spectra of 2-benzylidenemalononitrile.

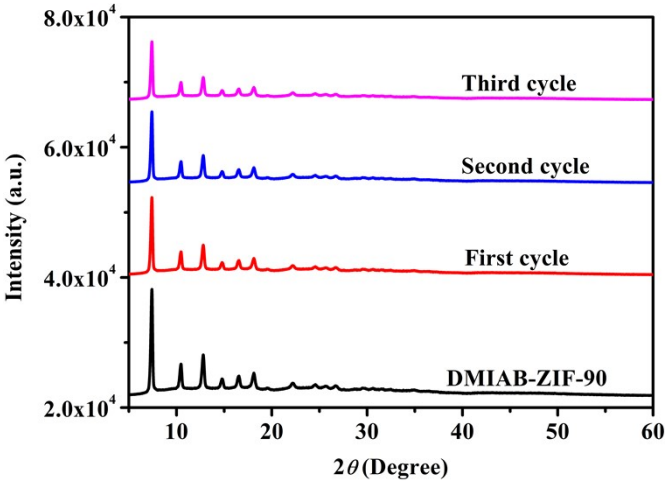

Figure S12 XRD patterns of DMIAB-ZIF-90 before and after each catalytic run.

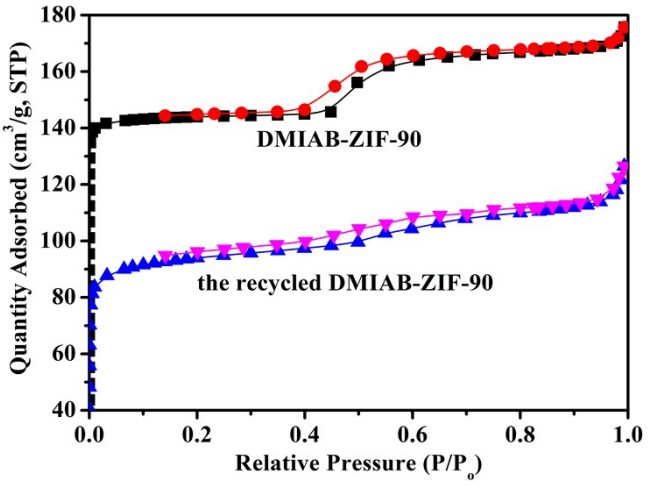

Figure S13 N_2 adsorption-desorption isotherms of DMIAB-ZIF-90 after three cycles of catalysis.

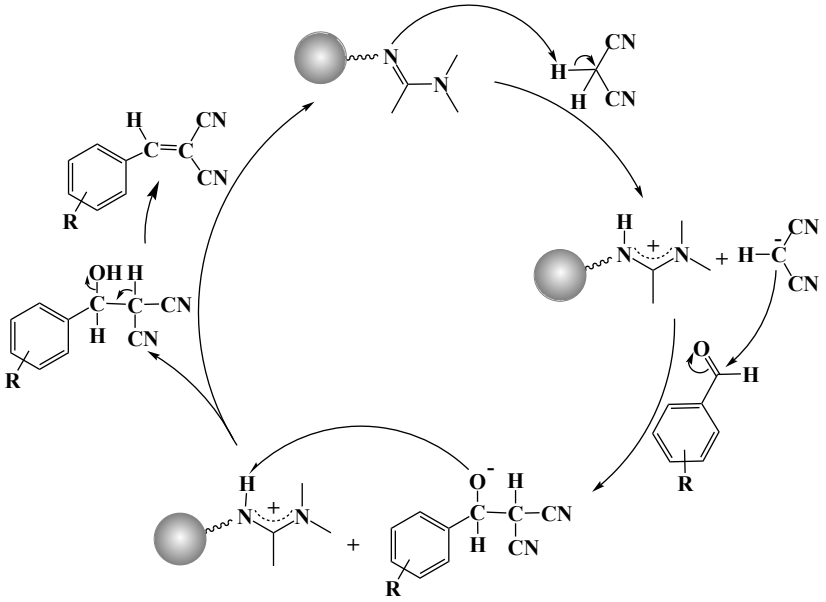

Figure S14 Proposed mechanism for the Knoevenagel condensation catalyzed by DMIAB-ZIF-90.

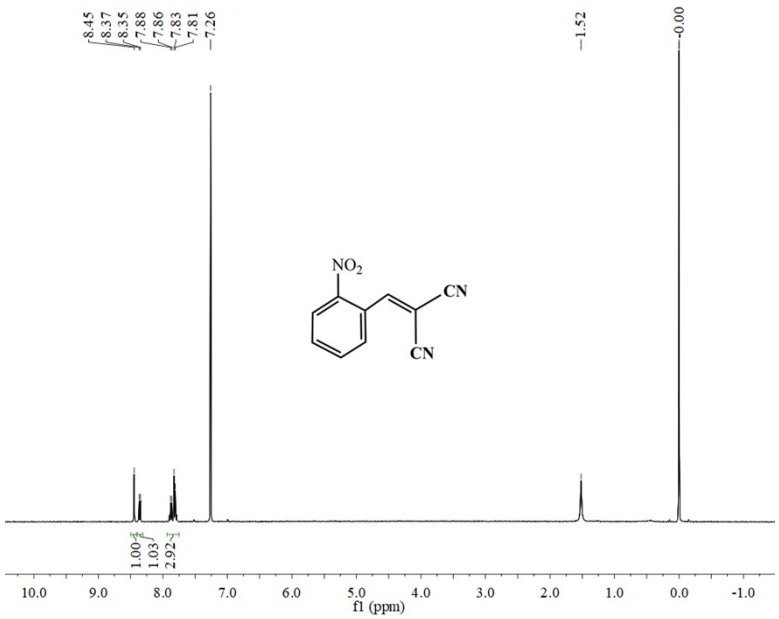

Figure S15 ^{1}H NMR spectra of 2-(2-nitrobenzylidene)malononitrile.

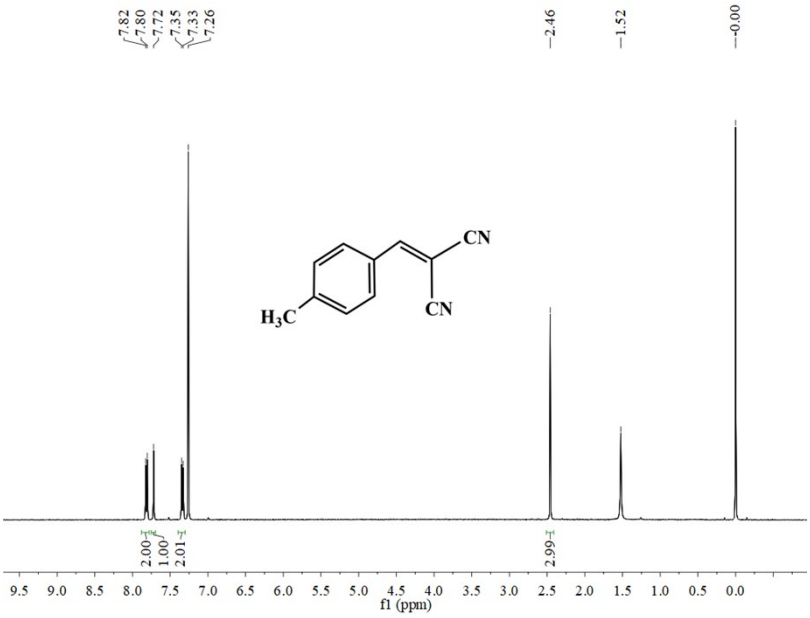

Figure S16 ^{1}H NMR spectra of 2-(4-methylbenzylidene)malononitrile.

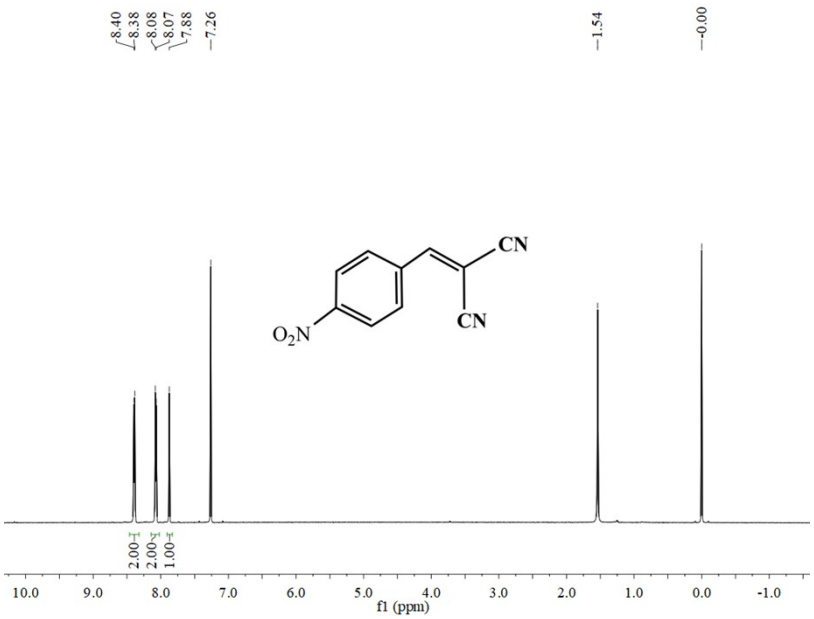

Figure S17 ^{1}H NMR spectra of 2-(4-nitrobenzylidene)malononitrile.

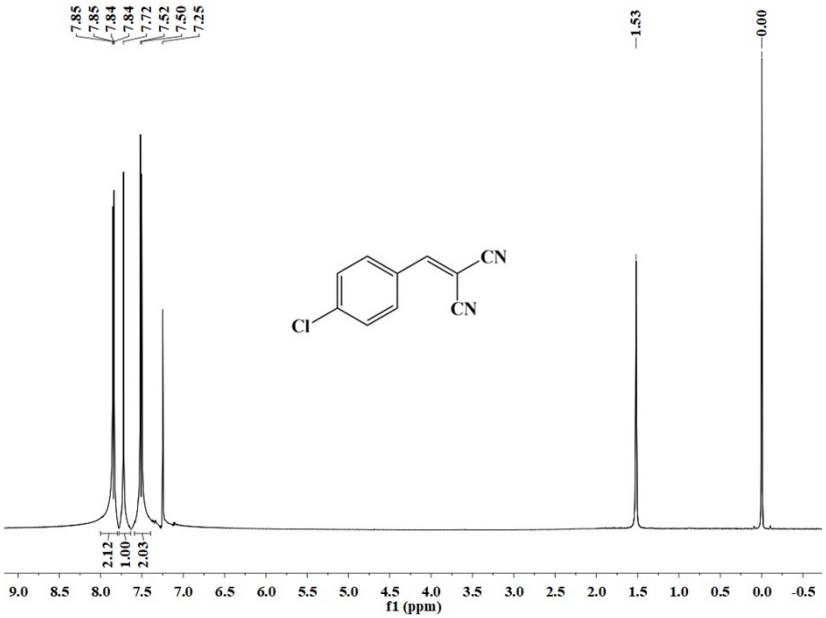

Figure S18 ^{1}H NMR spectra of 2-(4-chlorobenzylidene)malononitrile.

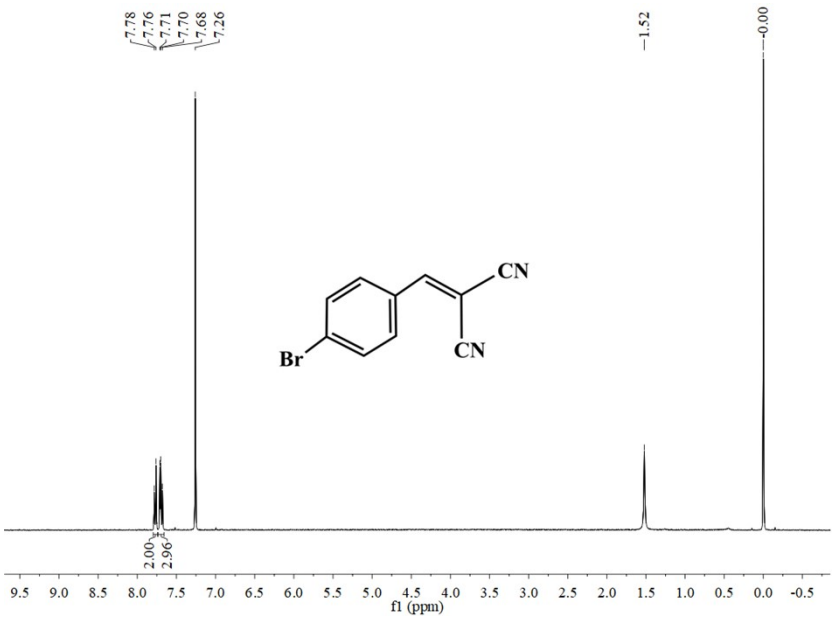

Figure S19 [1]H NMR spectra of 2-(4-bromobenzylidene)malononitrile.

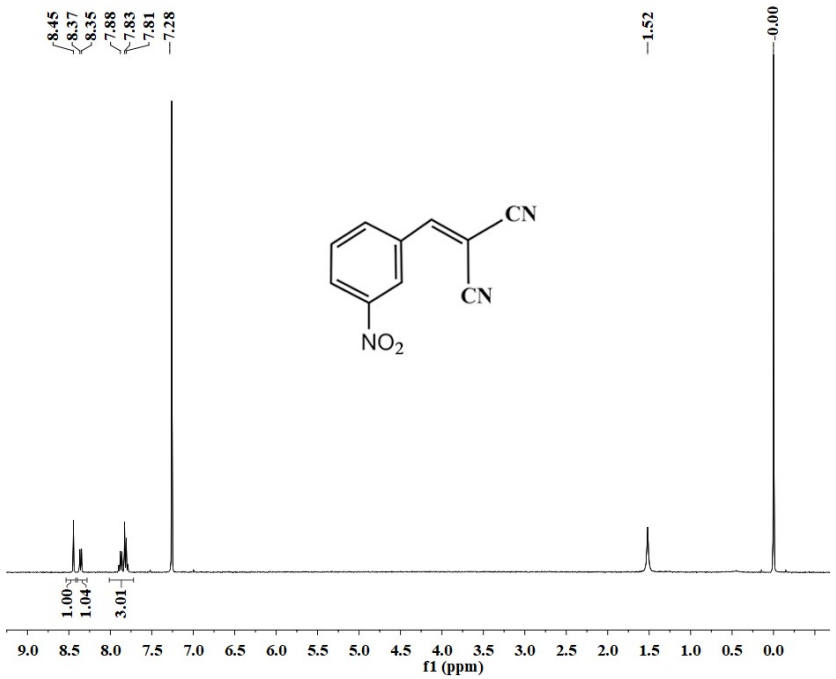

Figure S20 [1]H NMR spectra of 2-(3-nitrobenzylidene)malononitrile.

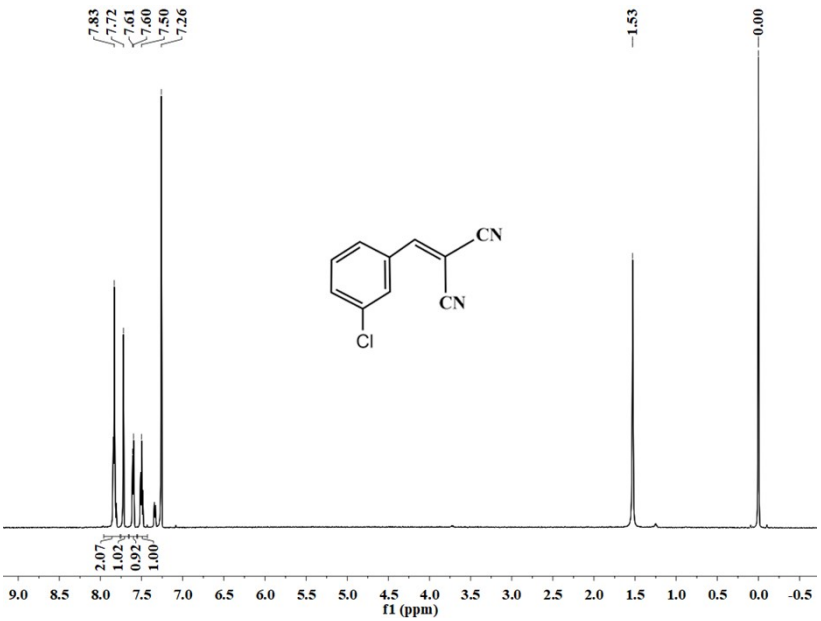

Figure S21 ^{1}H NMR spectra of 2-(3-chlorobenzylidene)malononitrile.

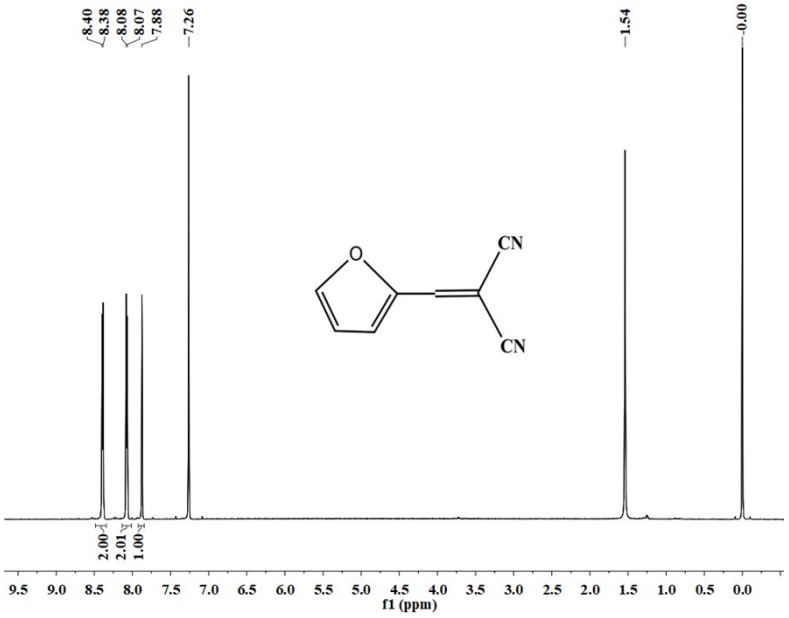

Figure S22 ^{1}H NMR spectra of 2-(furan-2-ylmethylene)malononitrile.

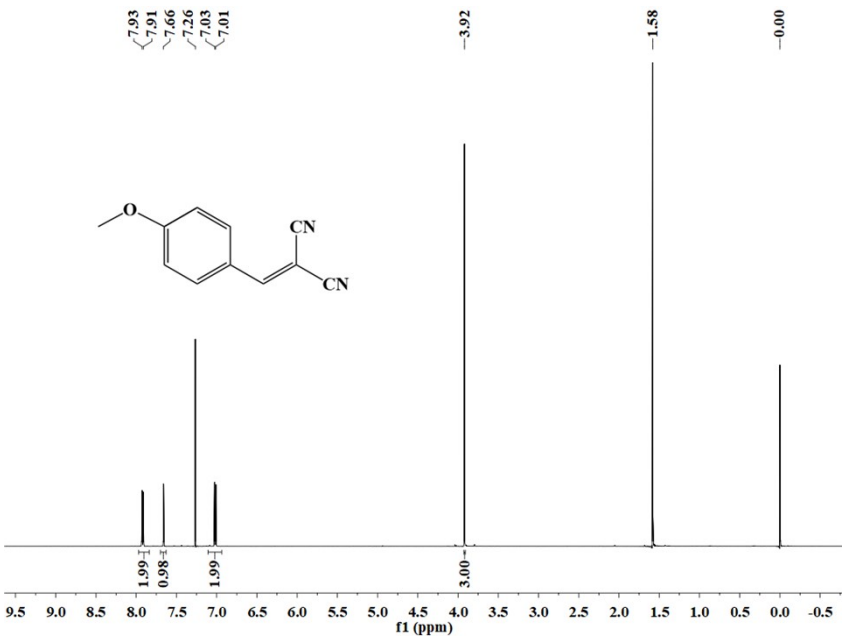

Figure S23 [1]H NMR spectra of 2-(4-methoxybenzylidene)malononitrile.

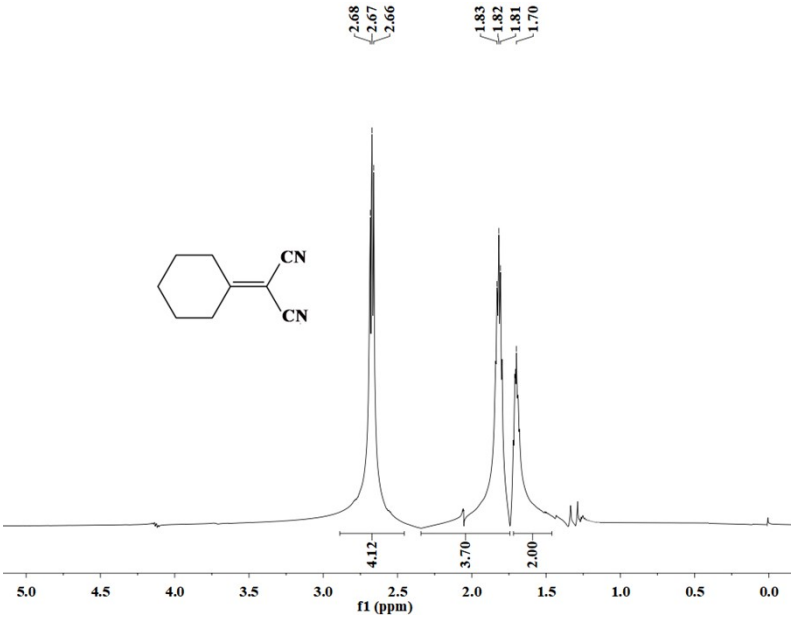

Figure S24 [1]H NMR spectra of 2-cyclohexylidenemalononitrile.

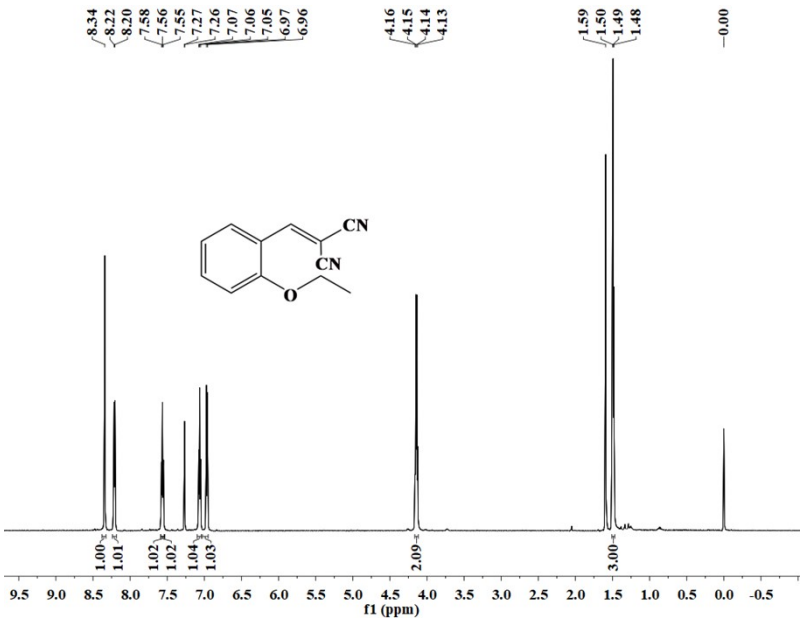

Figure S25 ^{1}H NMR spectra of 2-cyclohexylidenemalononitrile.

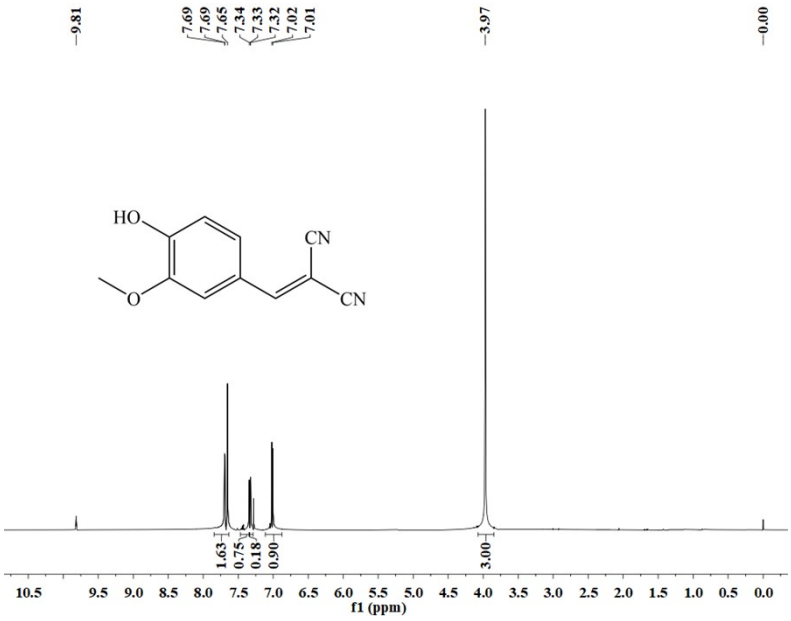

Figure S26 ^{1}H NMR spectra of 2-[(4-hydroxy-3-methoxyphenyl)methylidene]propanedinitrile.