Electronic Supporting Information

Pickering interfacial catalysis - Knoevenagel condensation in magnesium oxide stabilized Pickering emulsion

Amid L. Sadgar, Tushar S. Deore and Radha V. Jayaram*

Department of Chemistry, Institute of Chemical Technology

Nathalal Parekh Marg, Matunga, Mumbai-400019

Email: rv.jayaram@ictmumbai.edu.in

Figure S1. Opitical Microscope images - effect of particle concetration of MgO_{s_400} on droplet size

Figure S2. Photographs of reaction system for substituted benzaldehydes

Figure S3-S14 GC-MS spectra of α,β-unsaturated condesation products

Figure S15-S22 ^{1}H NMR and ^{13}C NMR of α,β-unsaturated condesation products

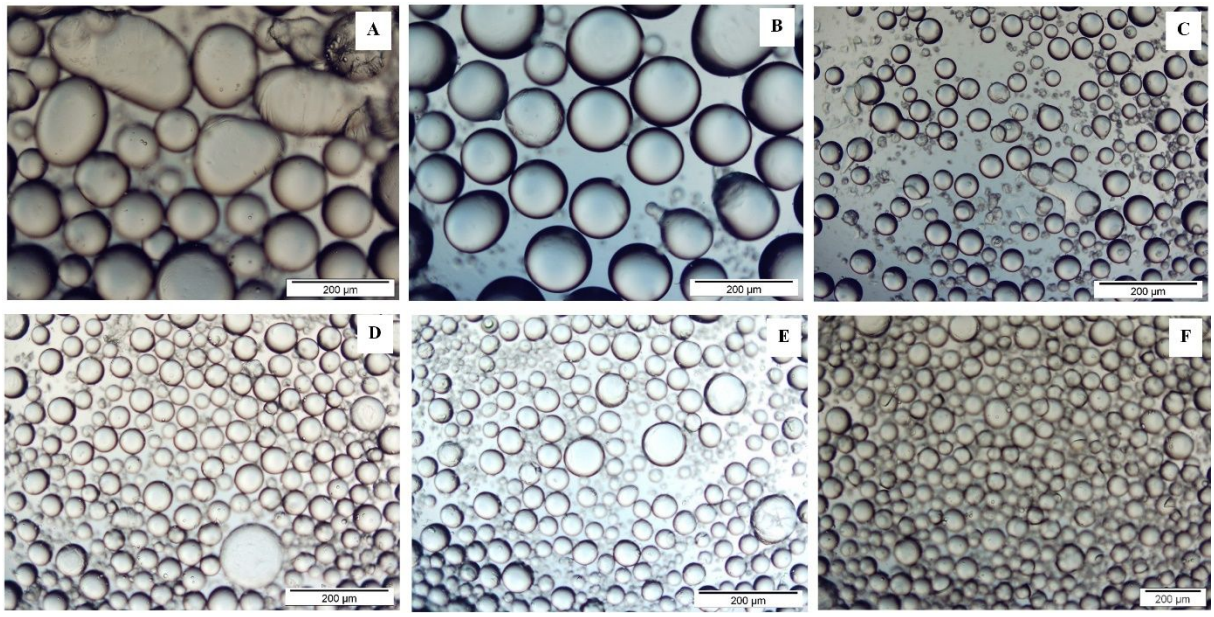

Figure S1. Optical microscopic images of MgO_{S_400} stabilized emulsions at different particle concentrations (A) 0.41 mg/ml (B) 0.83 mg/ml (C) 1.66 mg/ml (D) 2.50 mg/ml (E) 3.33 mg/ml (F) 4.16 mg/ml

Figure S2. Representative photograph of reaction systems of substituted benzaldehyde

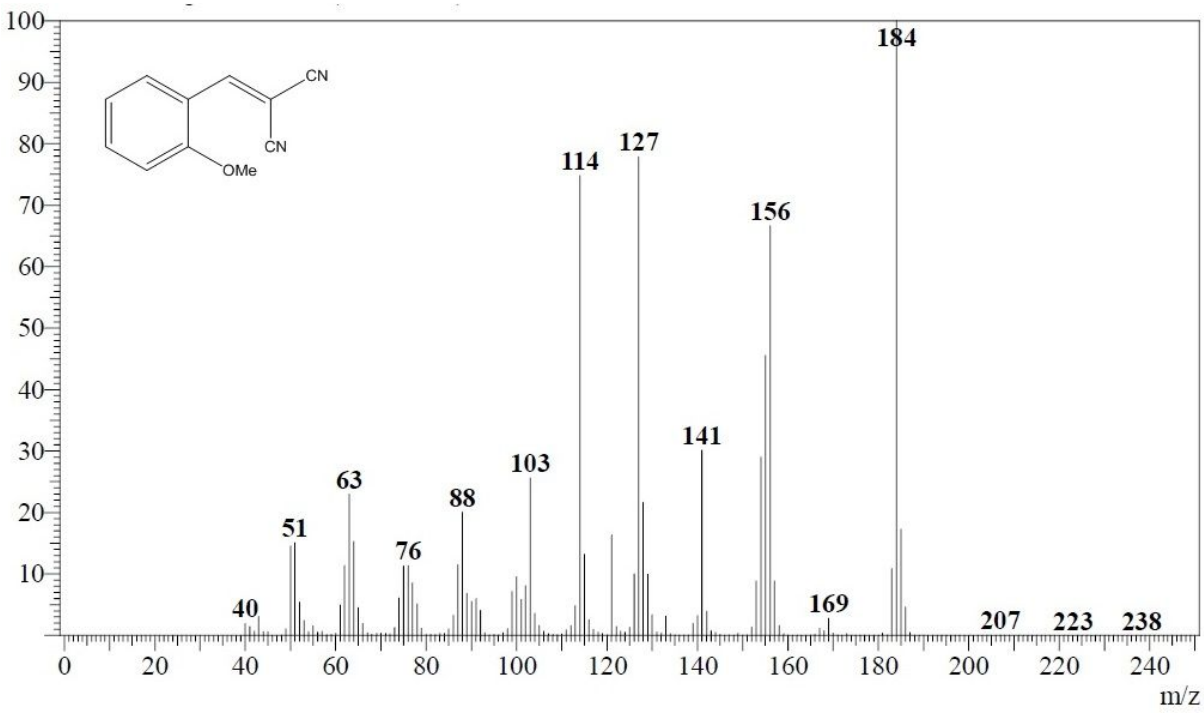

Figure S3. GC-MS spectra of 2-(2-methoxybenzylidene)malononitrile

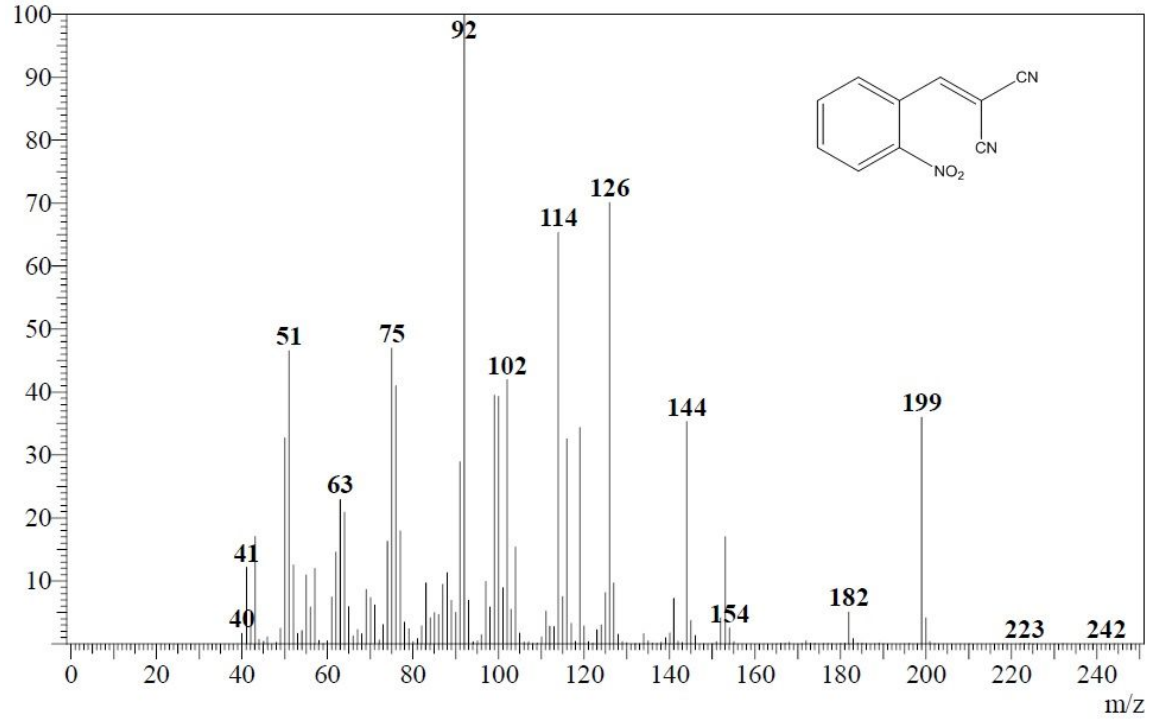

Figure S4. GC-MS spectra of 2-(2-nitrobenzylidene)malononitrile

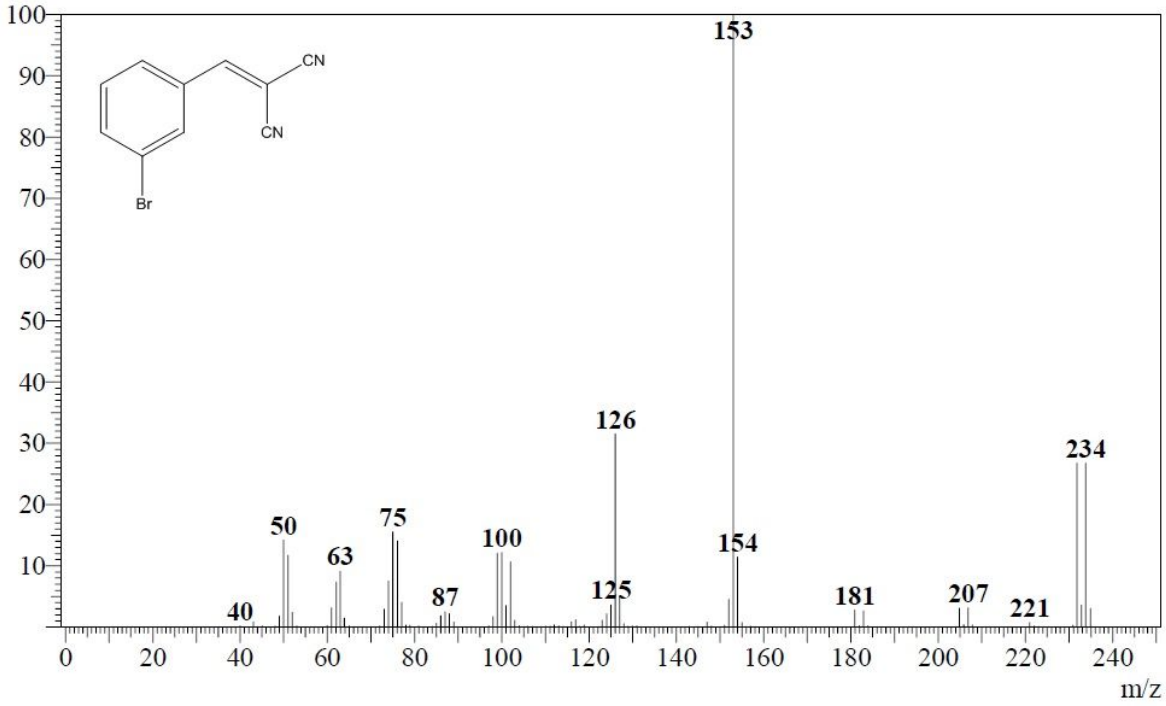

Figure S5. GC-MS spectra of 2-(3-bromobenzylidene)malononitrile

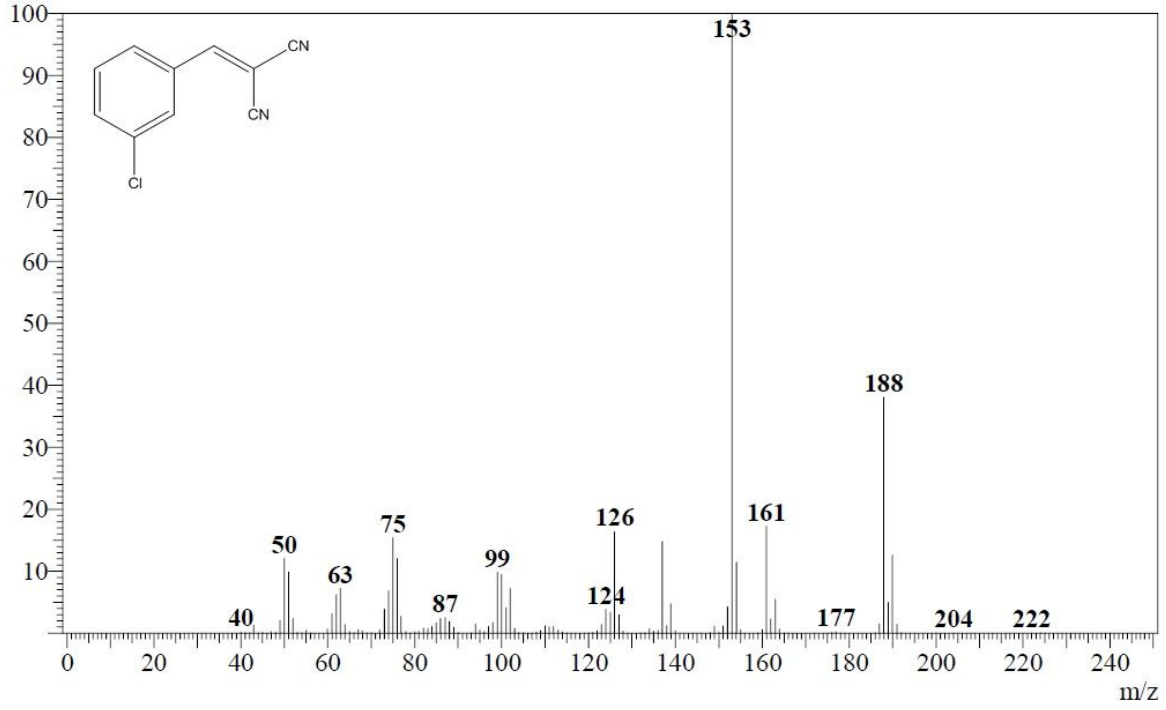

Figure S6. GC-MS spectra of 2-(3-chlorobenzylidene)malononitrile

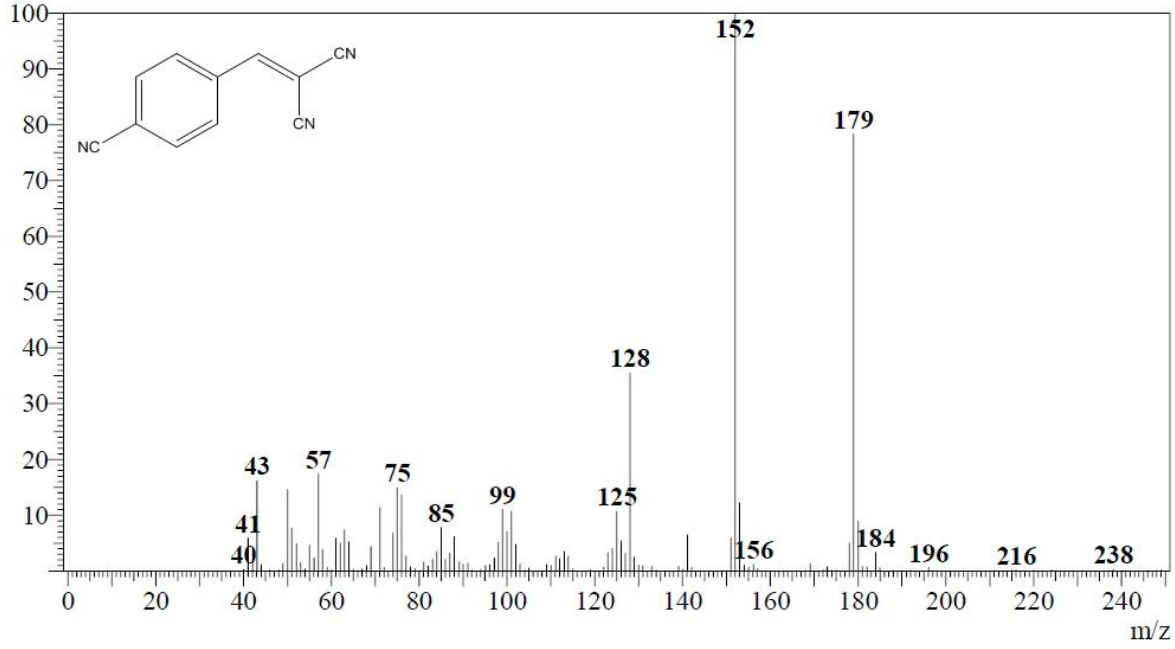

Figure S7. GC-MS spectra of 2-(4-cynobenzylidene)malononitrile

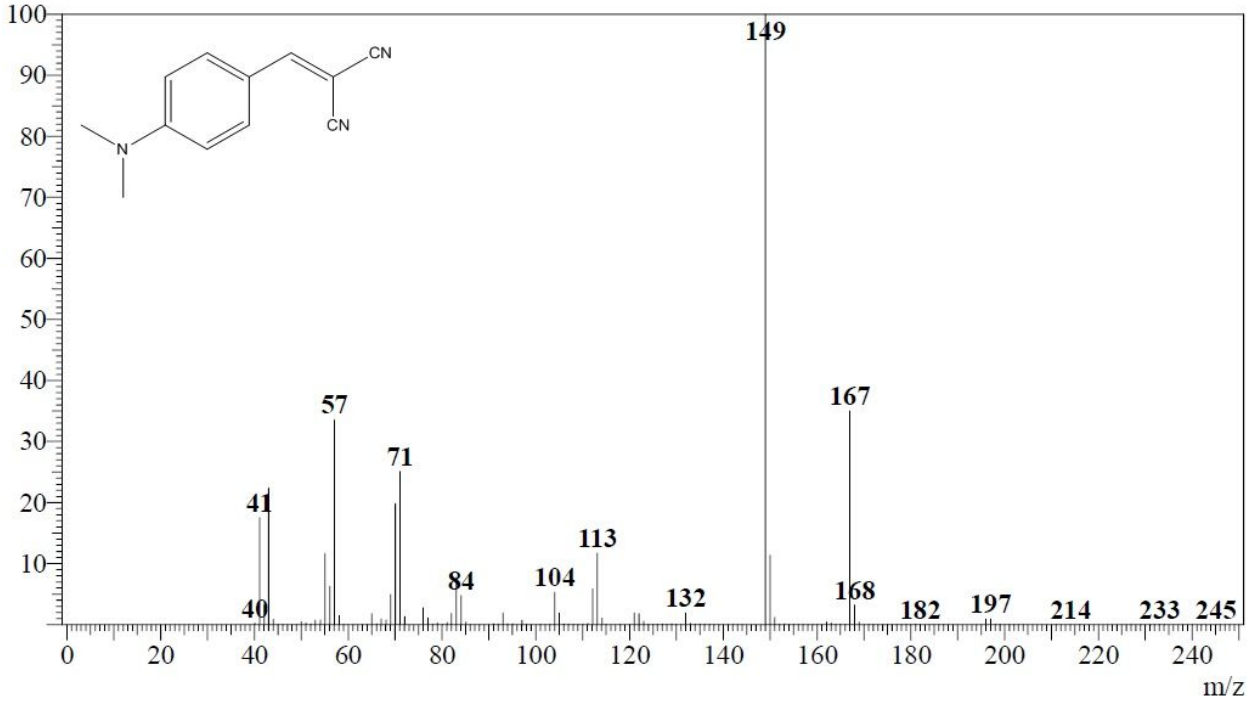

Figure S8. GC-MS spectra of 2-(4-(dimethylamino)benzylidine)malononitrile

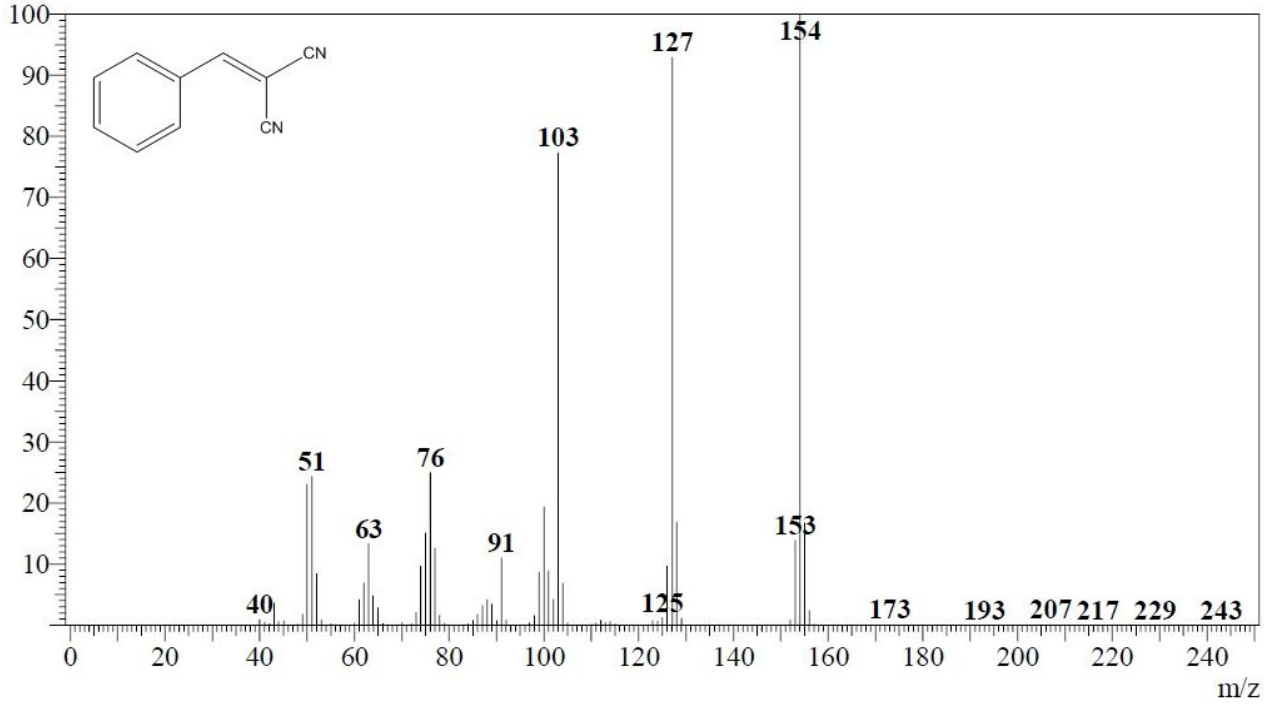

Figure S9. GC-MS spectra of 2-benzylidenemalononitrile

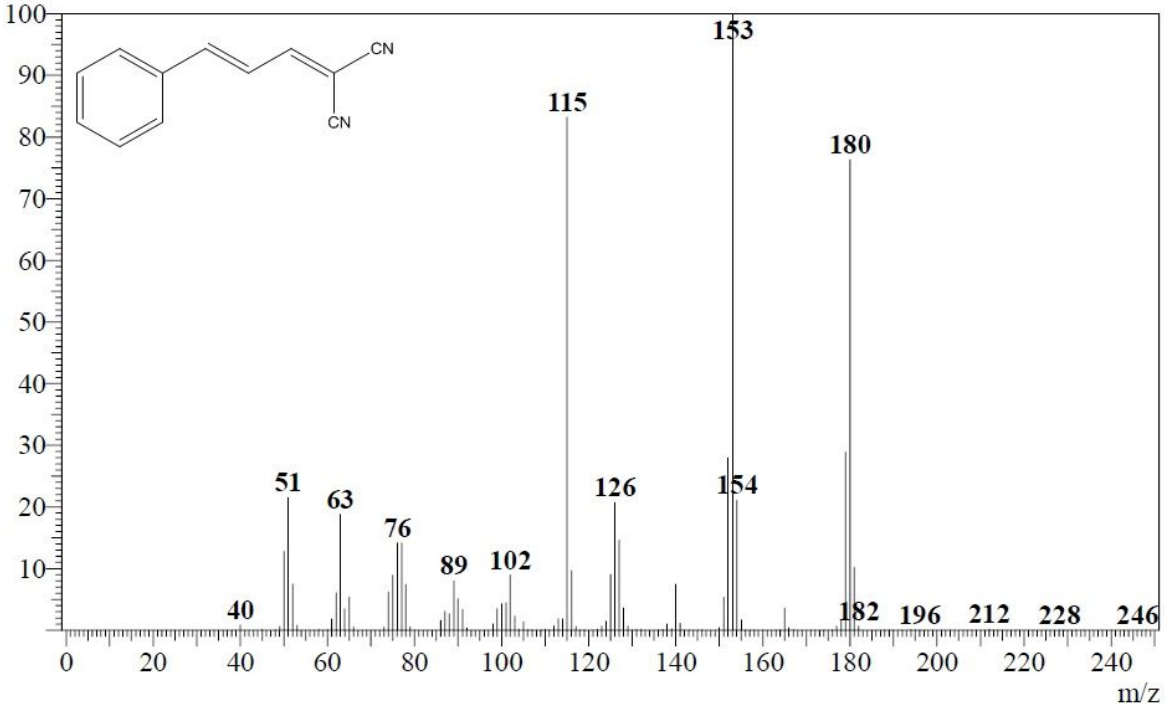

Figure S10. GC-MS spectra of 2-(3-phenylallylidene)malononitrile

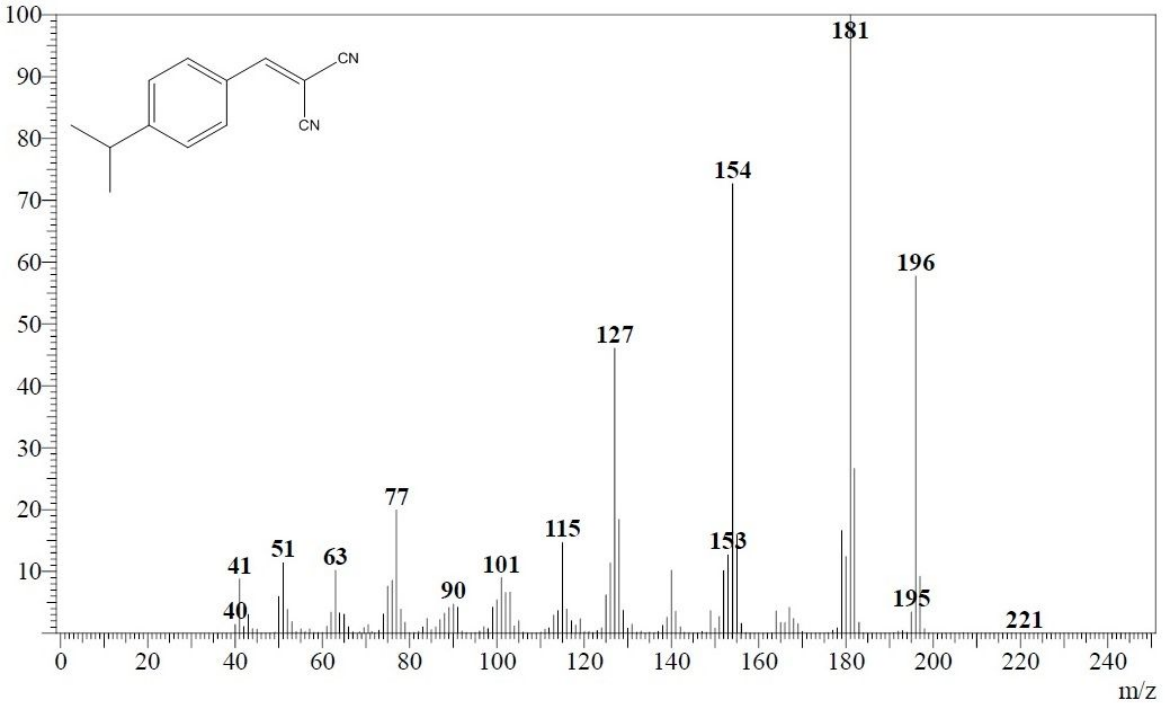

Figure S11. GC-MS spectra of 2-(4-isopropylbenzylidene)malononitrile

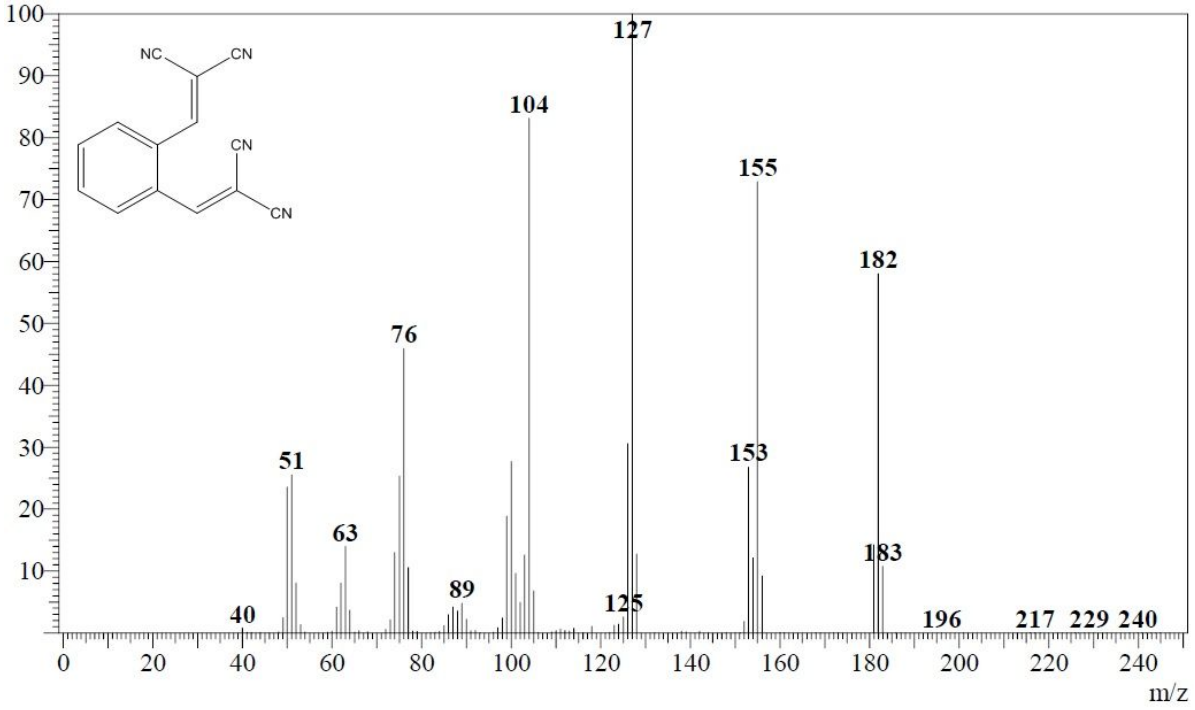

Figure S12. GC-MS spectra of 2,2'-(1,2-phenylenebis(methanylylidene))dimalononitrile

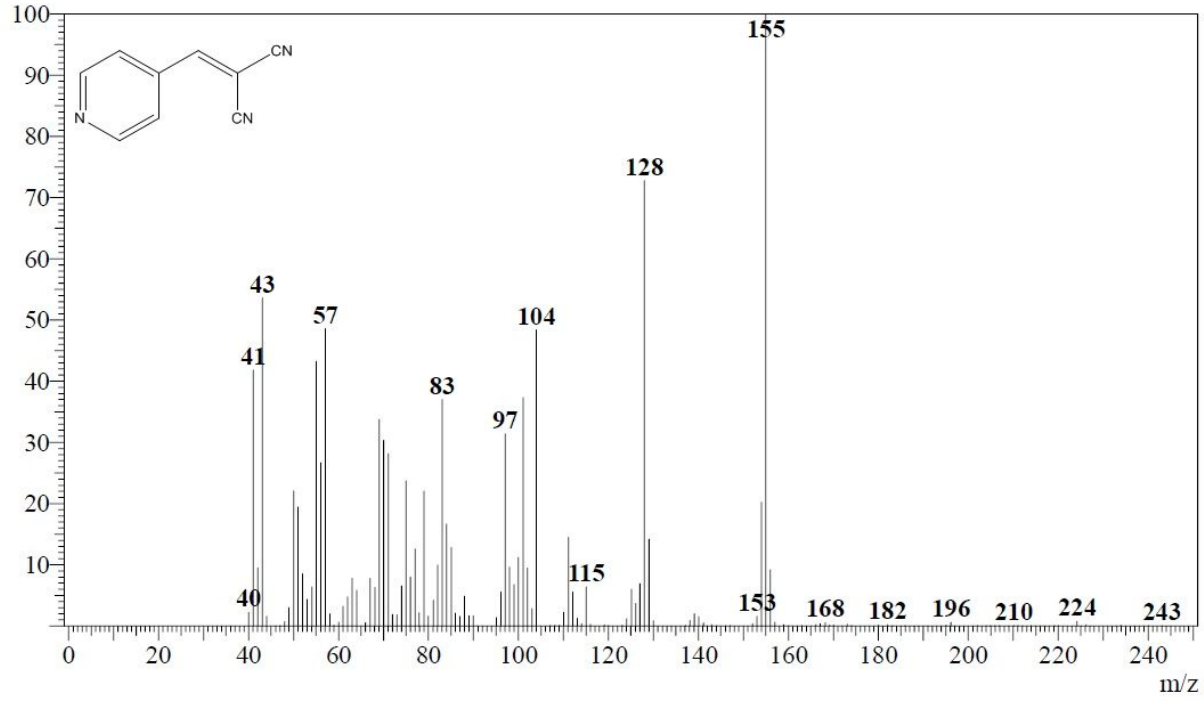

Figure S13. GC-MS spectra of 2-(4-pyridylmethylidene)malononitrile

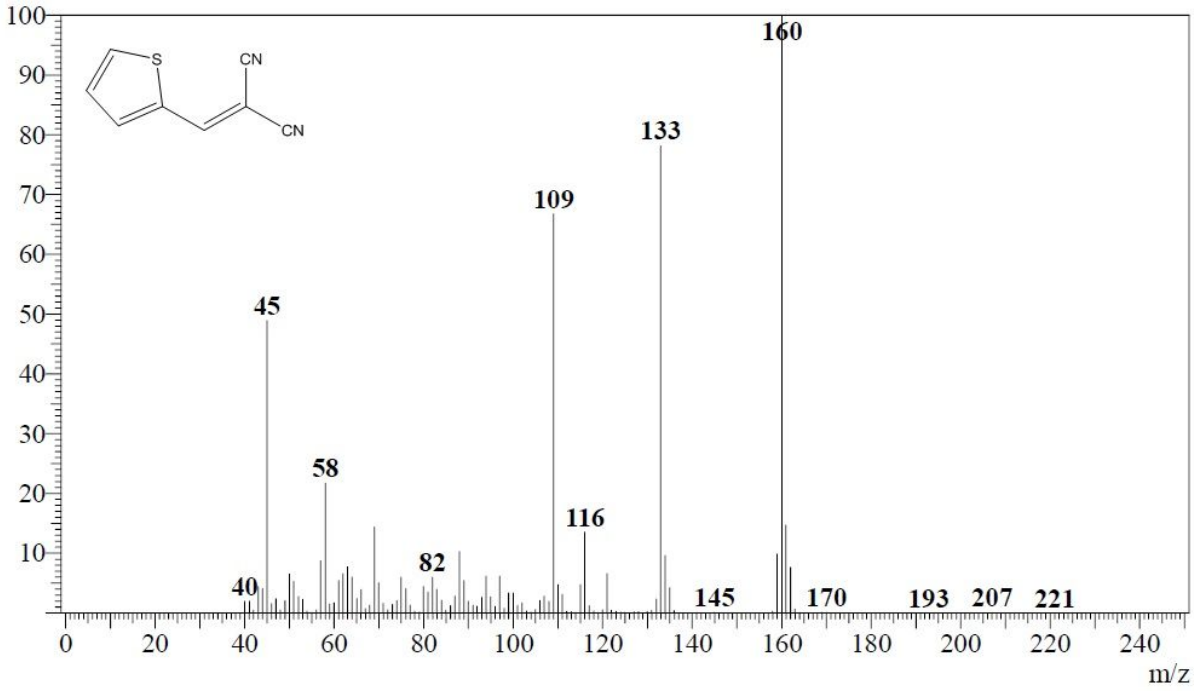

Figure S14. GC-MS spectra of 2-(2-thiophenylmethylidene)malononitrile

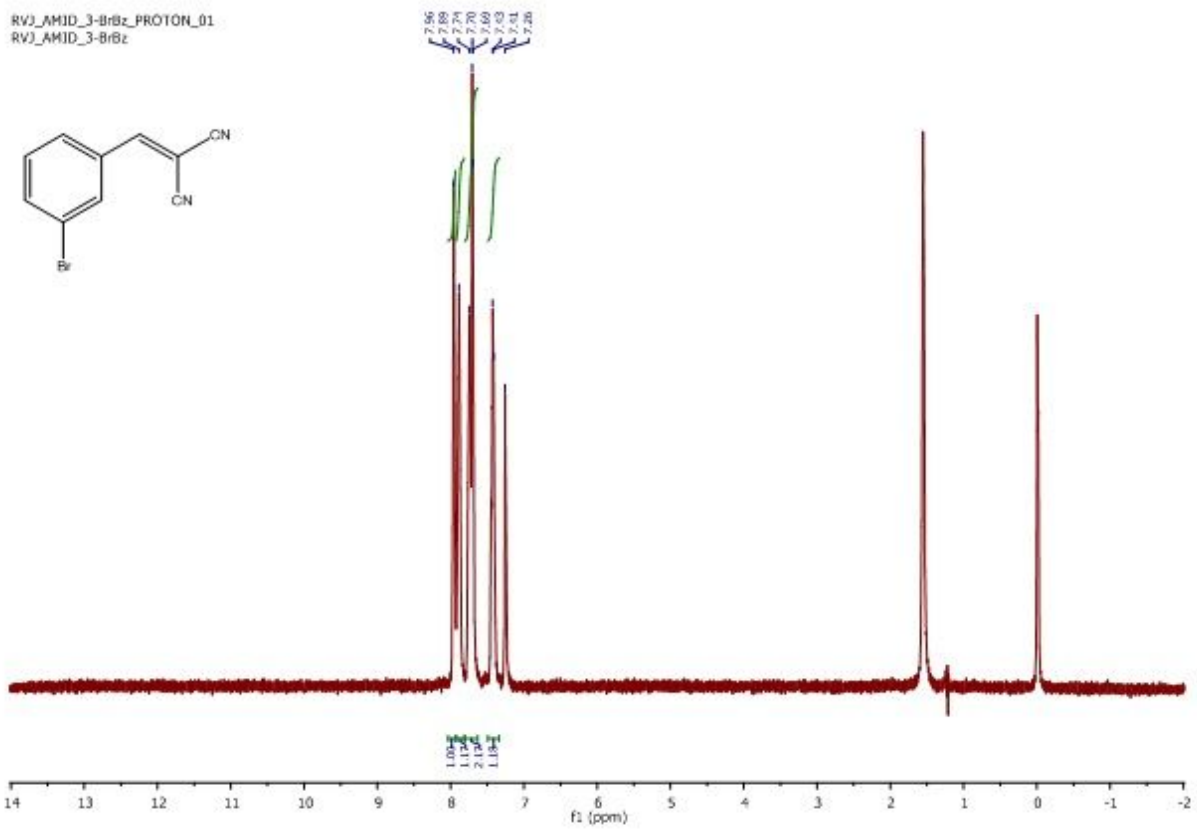

Figure S15. ^{1}H NMR of 2-(3-bromobenzylidene)malononitrile

^{1}H NMR (400 MHz; $CDCl_3$; 25°C): δ = 7.96 (1 H, s, CH), 7.89 (1 H, d, 8.0 Hz, ph), 7.69 (1 H, d, 8.0 Hz, ph), 7.43 (1H, t, J =8.0 Hz), 7.26 (1 H, ph)

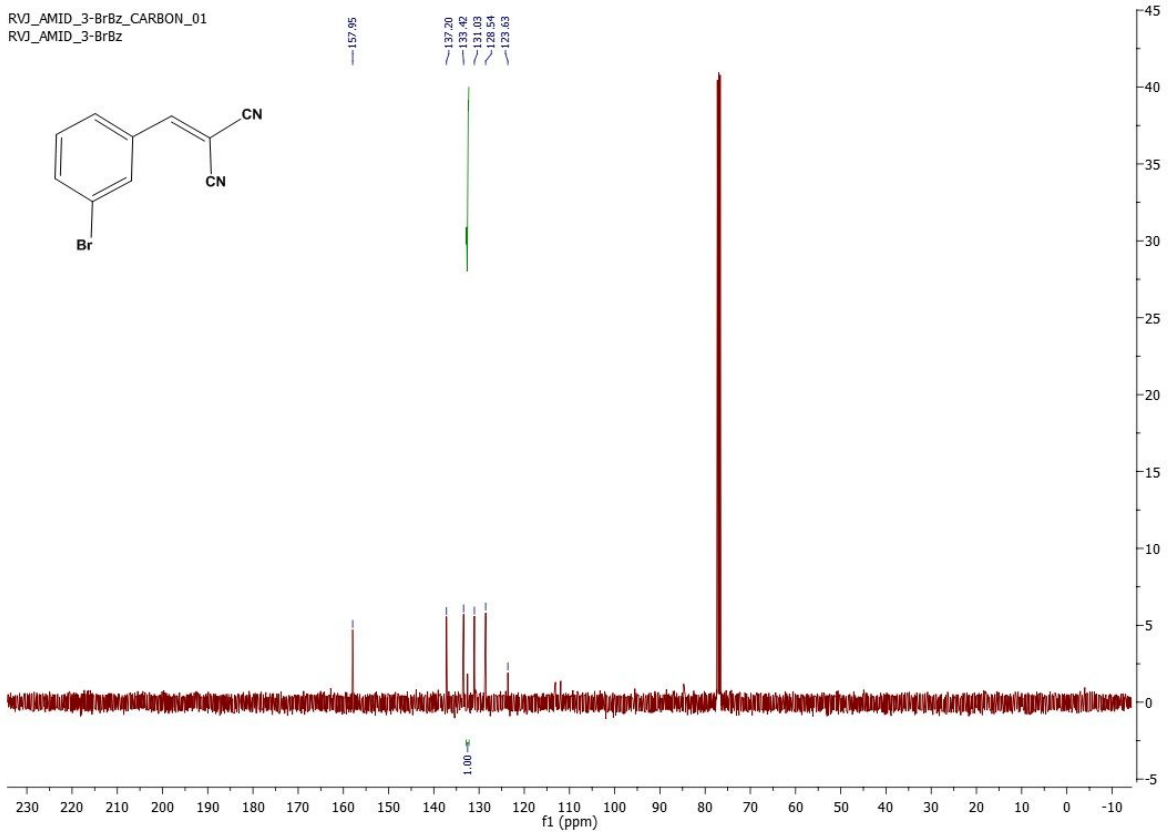

Figure 16. ^{13}C NMR of 2-(3-bromobenzylidene)malononitrile

^{13}C NMR (100MHz; $CDCl_3$; 25 °C): δ 157.95, 133.42, 131.01, 132, 128.54, 123.63, 114, 113,85

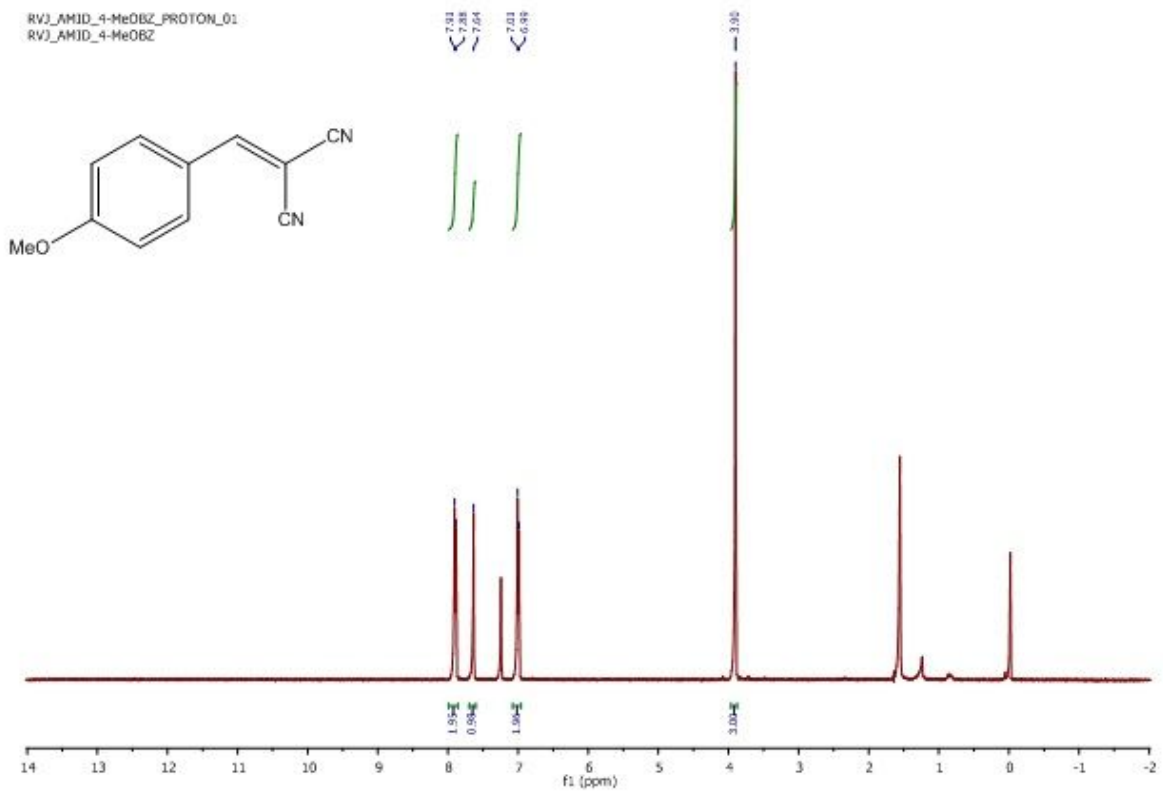

Figure S17. ^{1}H NMR of 2-(4-methoxybenzylidene)malononitrile

^{1}H NMR (400 MHz; $CDCl_3$; 25 °C): δ = 7.91 (2H, d, J=8.5 Hz, ph), 7.01 (d, 8.5Hz, ph), 7.77 (1H, s, CH)

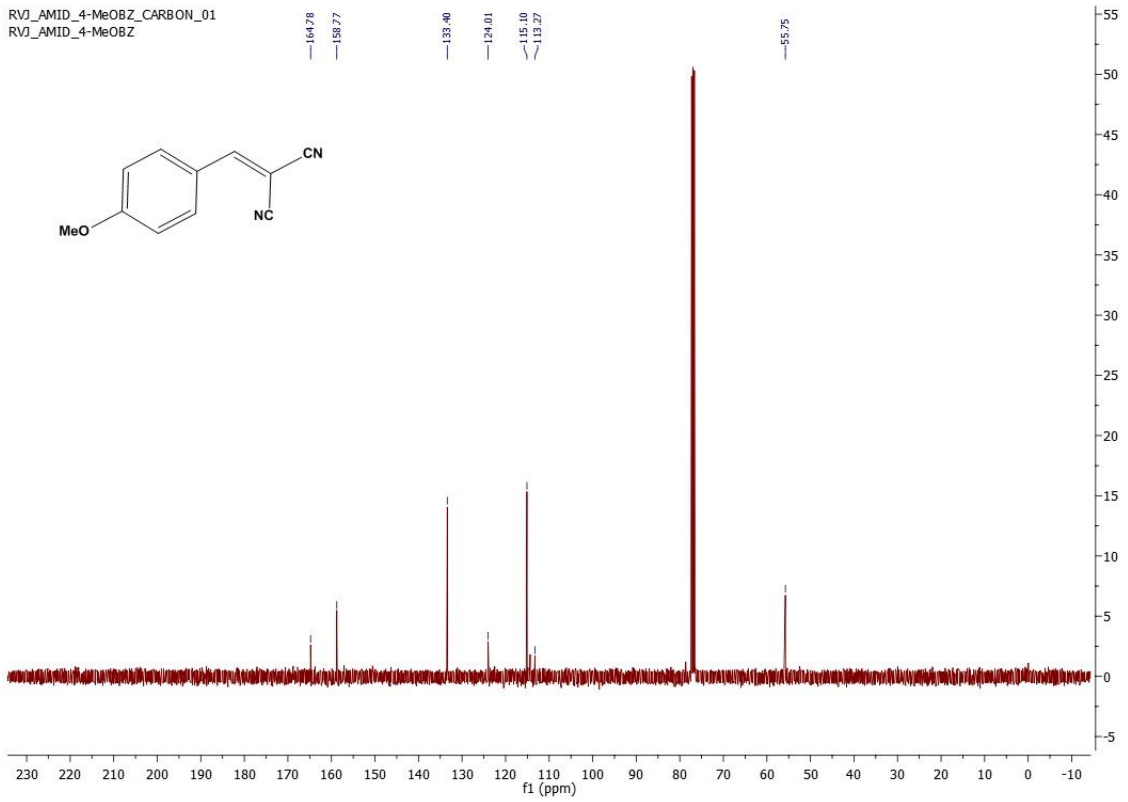

Figure 18. ^{13}C NMR of 2-(4-methoxybenzylidene)malononitrile

^{13}C NMR; (100MHz; $CDCl_3$; 25 °C): δ 164.76, 158.77, 133.40, 124.01, 115.10, 114.5, 113.27, 55.75

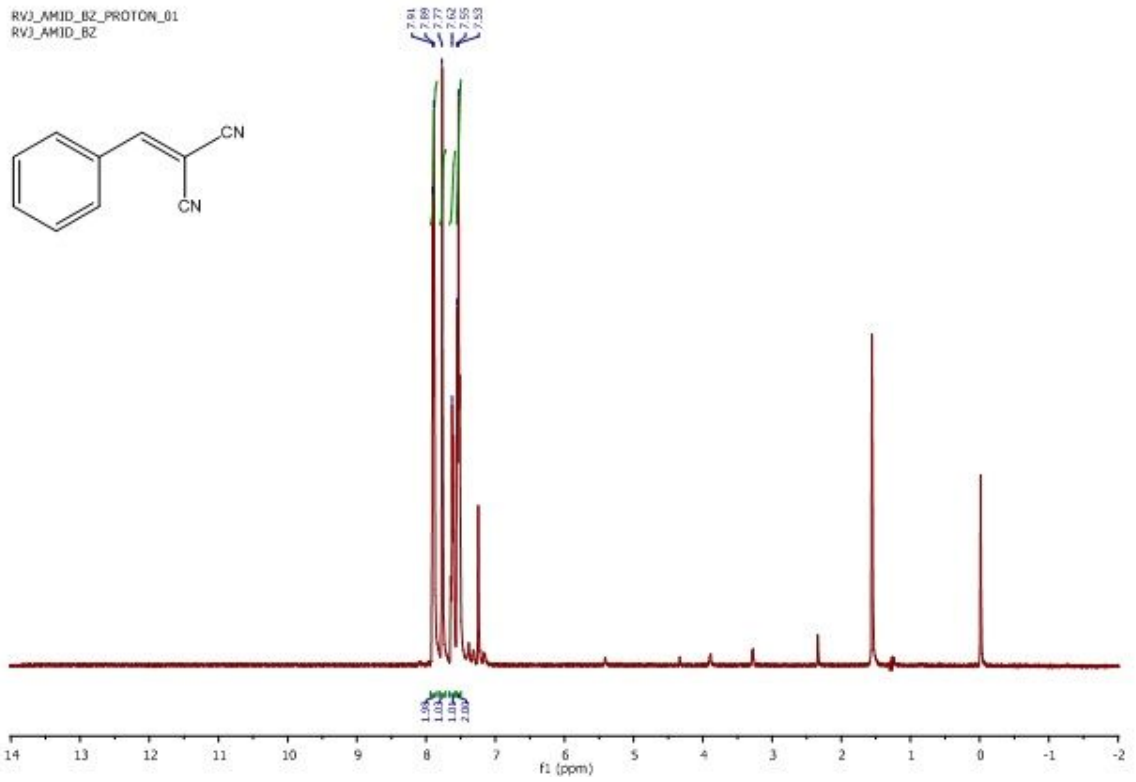

Figure S19. ^{1}H NMR of 2-benzylidenemalononitrile

^{1}H NMR (400 MHz; $CDCl_3$; 25 °C): δ = 7.91 (2 H, d, J=8.5 Hz, ph), 7.77 (1 H, s, CH), 7.53–7.62 (3 H, m, ph)

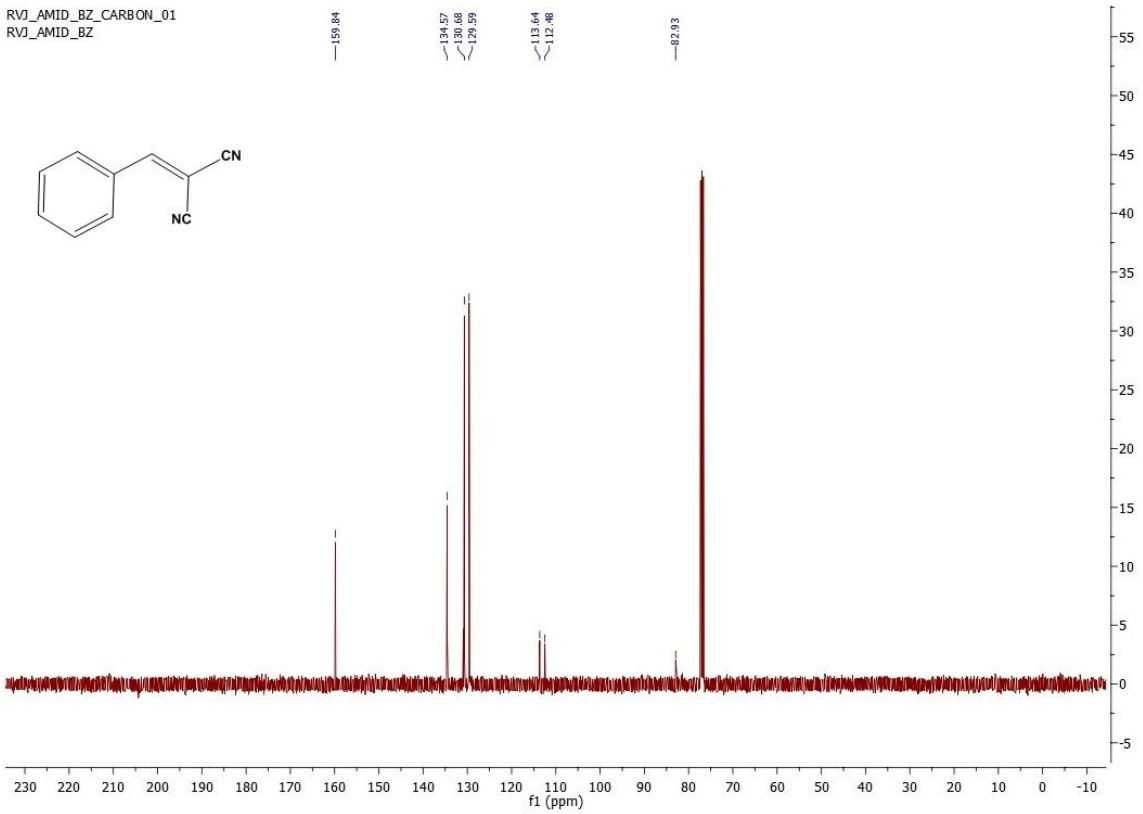

Figure 20. ^{13}C NMR of 2-benzylidenemalononitrile

^{13}C NMR; (100; $CDCl_3$; 25 °C): δ 159.84, 134.57, 130.38, 129.59, 113.85, 112.69,82.95

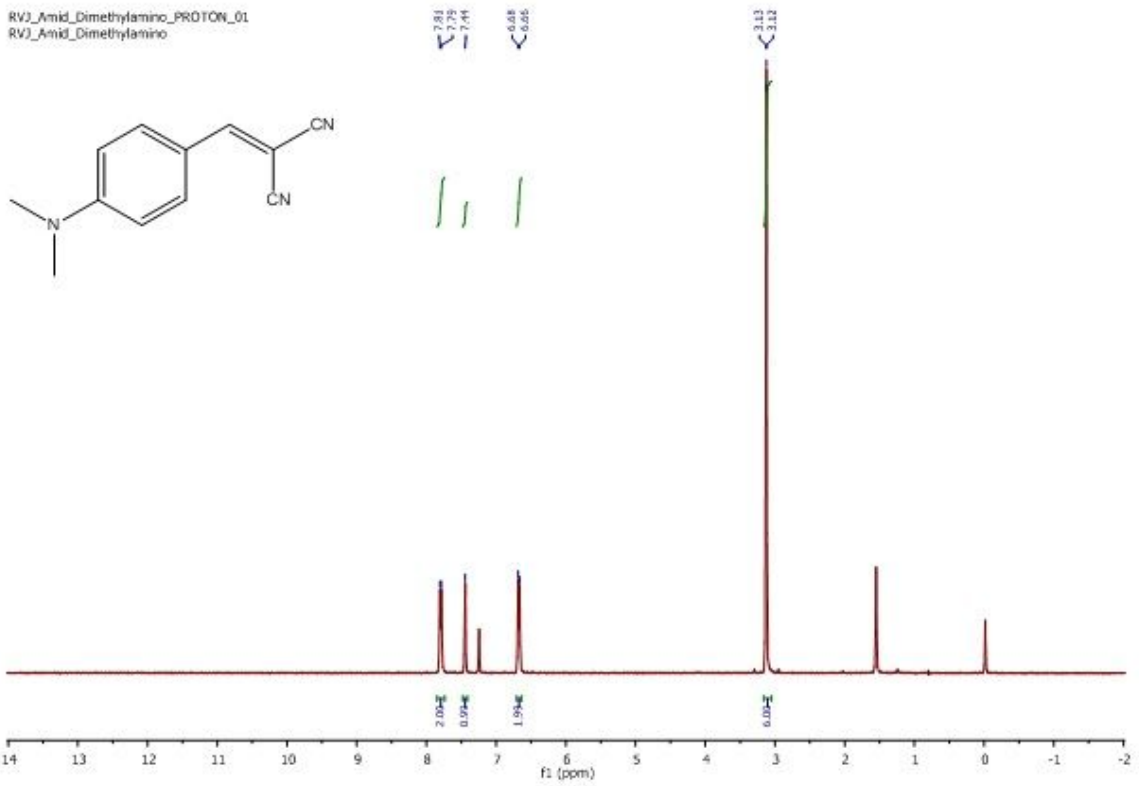

Figure S21. ^{1}H NMR of 2-(4-(dimethylamino)benzylidine)malononitrile

^{1}H NMR (400 MHz; $CDCl_3$; 25 °C): δ = 3.13 (6 H, s, CH3), 6.68 (2 H, d, J = 9.2Hz, ph), 7.44 (1H, s, CH), 7.81 (2 H, d, J = 9.2 Hz, ph).

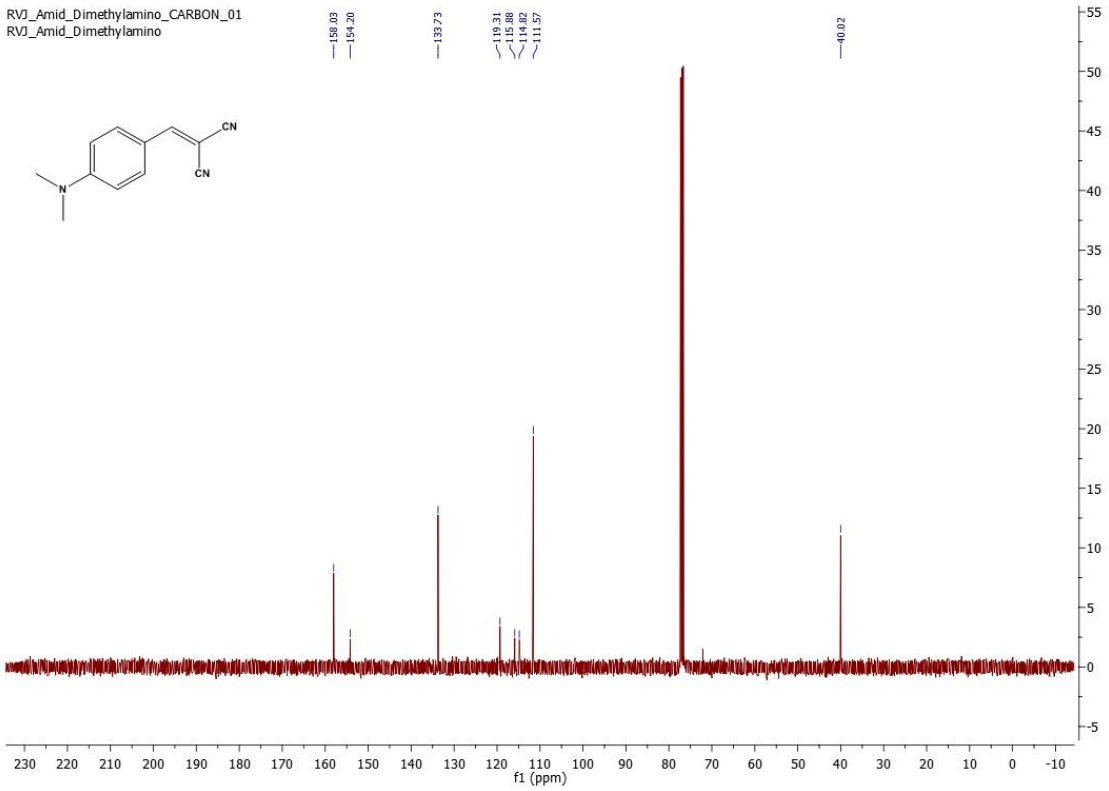

Figure 22. ^{13}C NMR of 2-(4-(dimethylamino)benzylidine)malononitrile

^{13}C NMR (100 MHz; $CDCl_3$; 25 °C): δ = 158.03, 154.20, 133.73, 119.31, 115.88, 114.82, 111.57, 40.02