Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supporting Information

Supported copper on a diamide-diacid-bridged PMO: An efficient hybrid catalyst for the cascade oxidation of benzyl alcohols/Knoevenagel condensation

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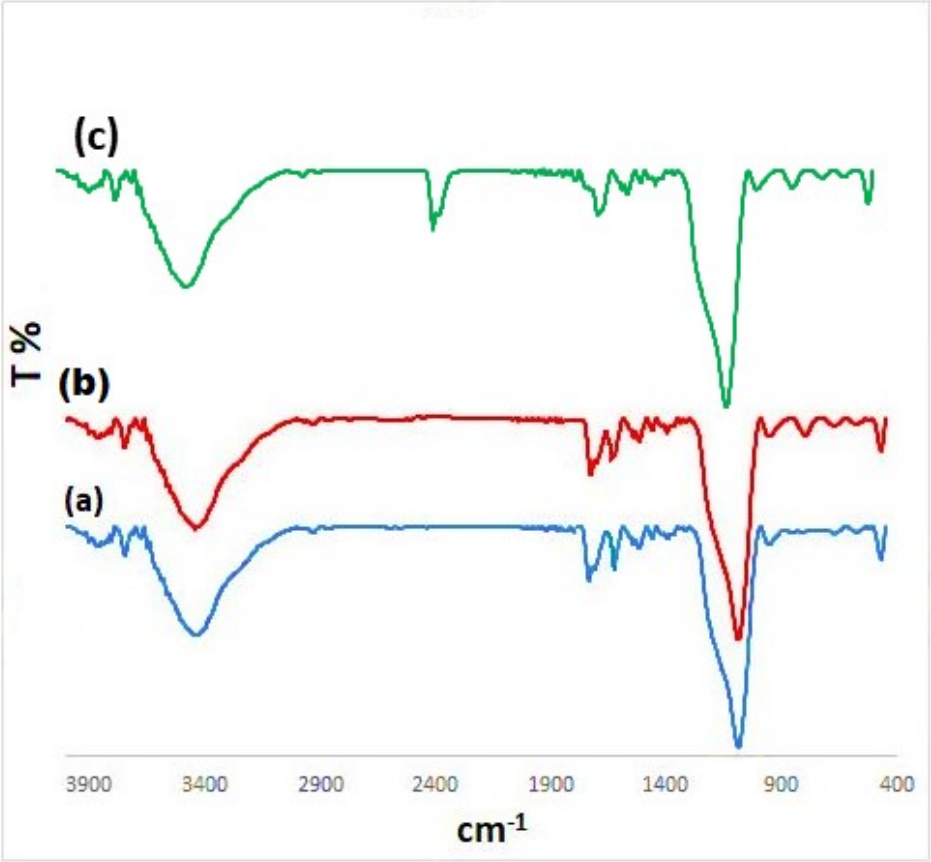

Fig. S1. FTIR spectra of the EDTAD-PMO (a), fresh Cu@EDTAD-PMO mesoporous catalyst (**1**, b) and the recycled catalyst after six consecutive runs (c).

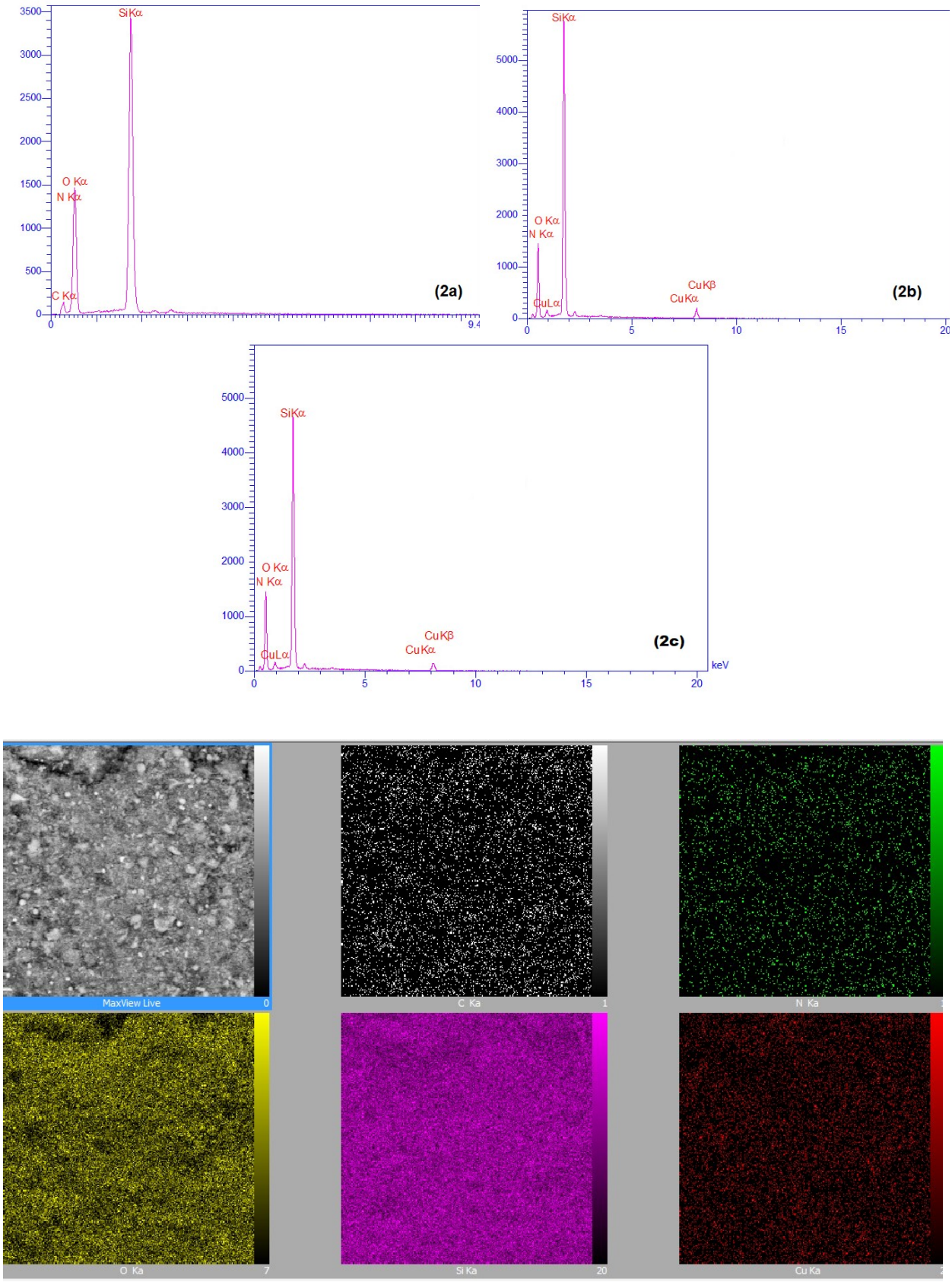

Fig. S2. EDX spectra of the EDTAD-PMO (**2a**), fresh Cu@EDTAD-PMO (**1**, **2b**) and the recycled Cu@EDTAD-PMO catalyst (**1**) from the model reaction after six consecutive runs (**1**, **2c**) along with the elemental mapping of the fresh Cu@EDTAD-PMO (**1**).

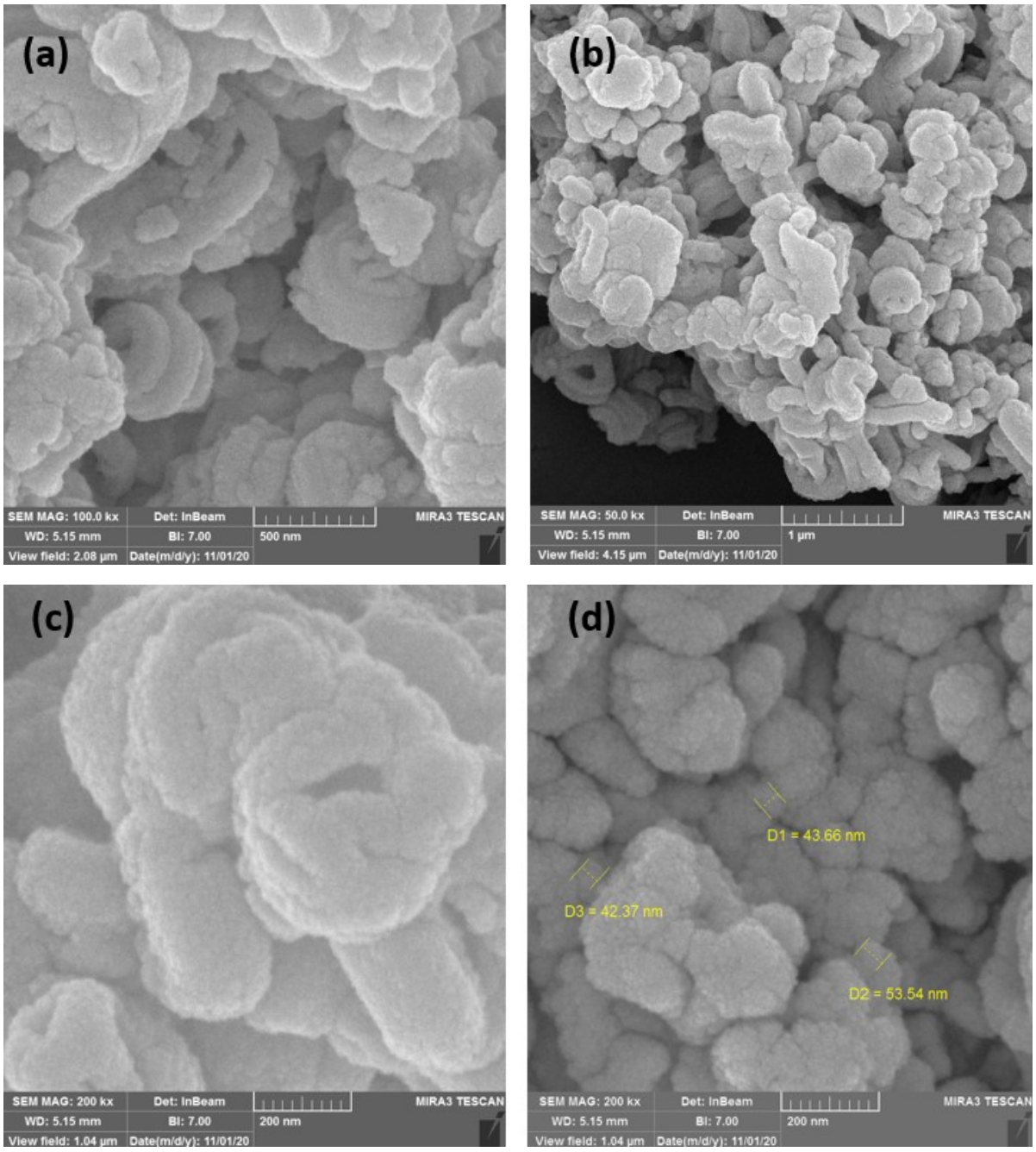

Fig. S3. FESEM images of the Cu@EDTAD-PMO nano-ordered catalyst (**1**).

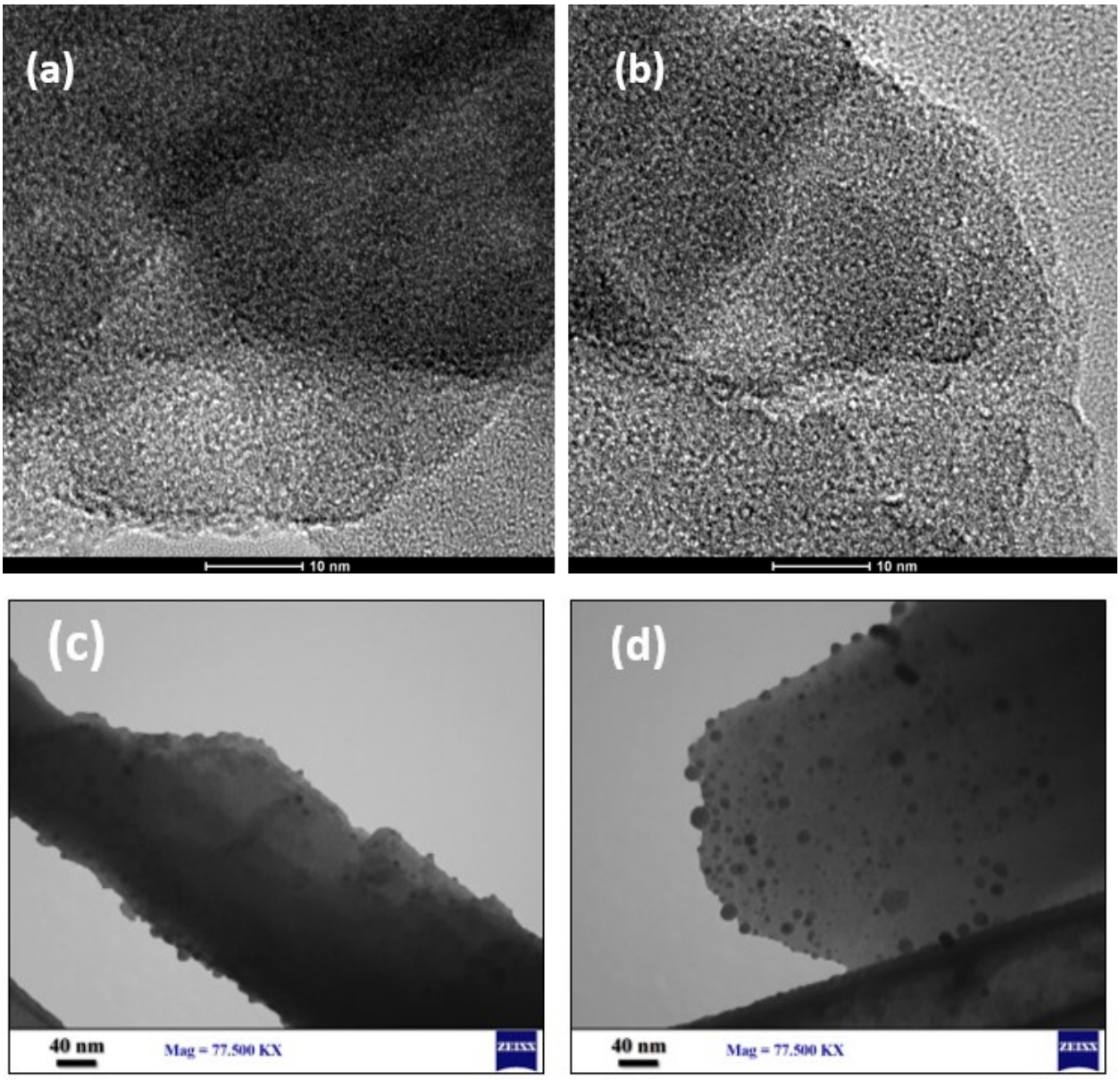

Fig. S4. HRTEM images of the Cu@EDTAD-PMO nano-ordered catalyst (**1**).

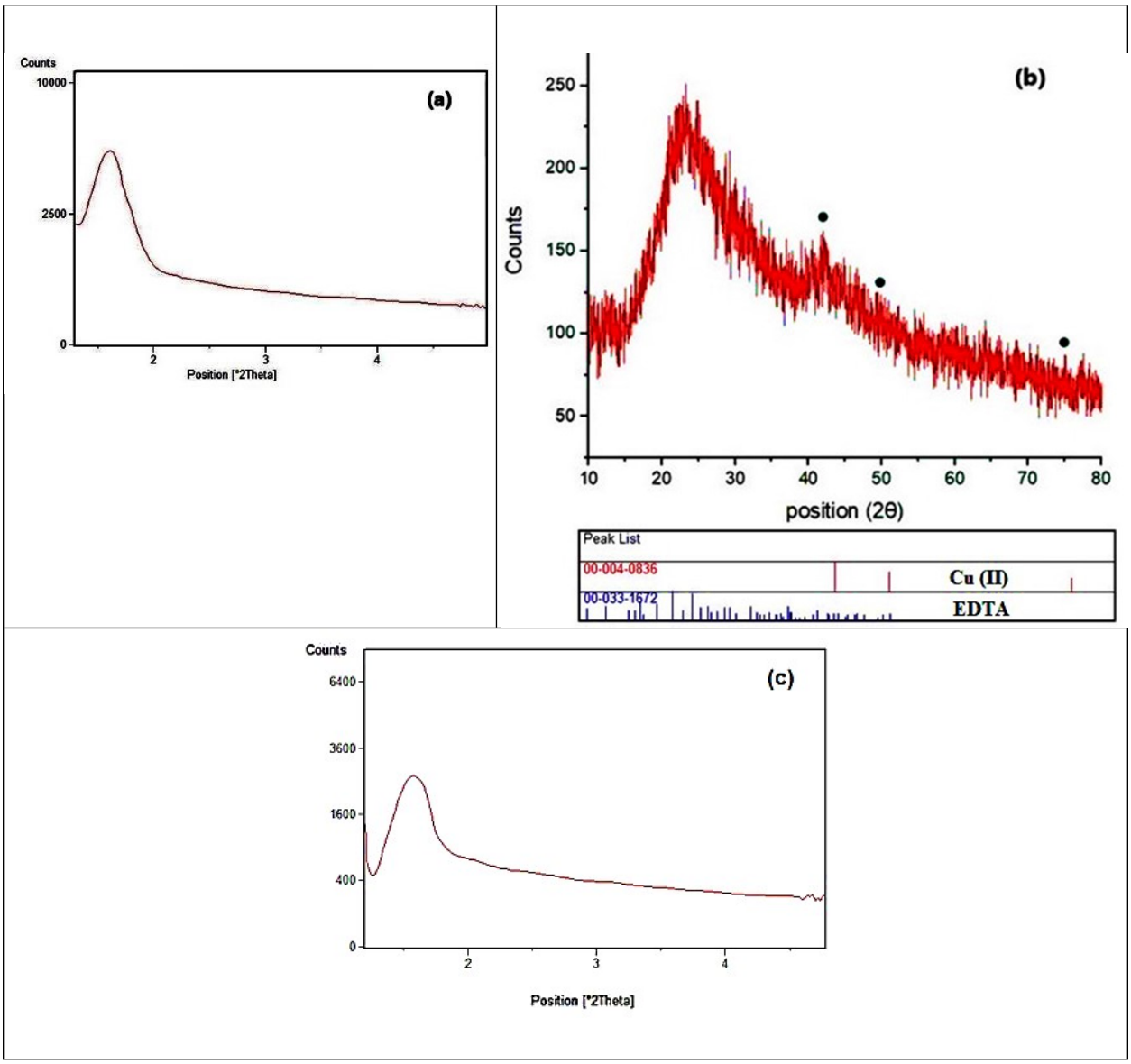

Fig. S5. Low-angle (**5a**) and wide-angle (**5b**) XRD patterns of the fresh Cu@EDTAD-PMO catalyst (**1**); low-angle XRD pattern (**5c**) of the recycled Cu@EDTAD-PMO catalyst (**1**) from the model reaction after six consecutive runs.

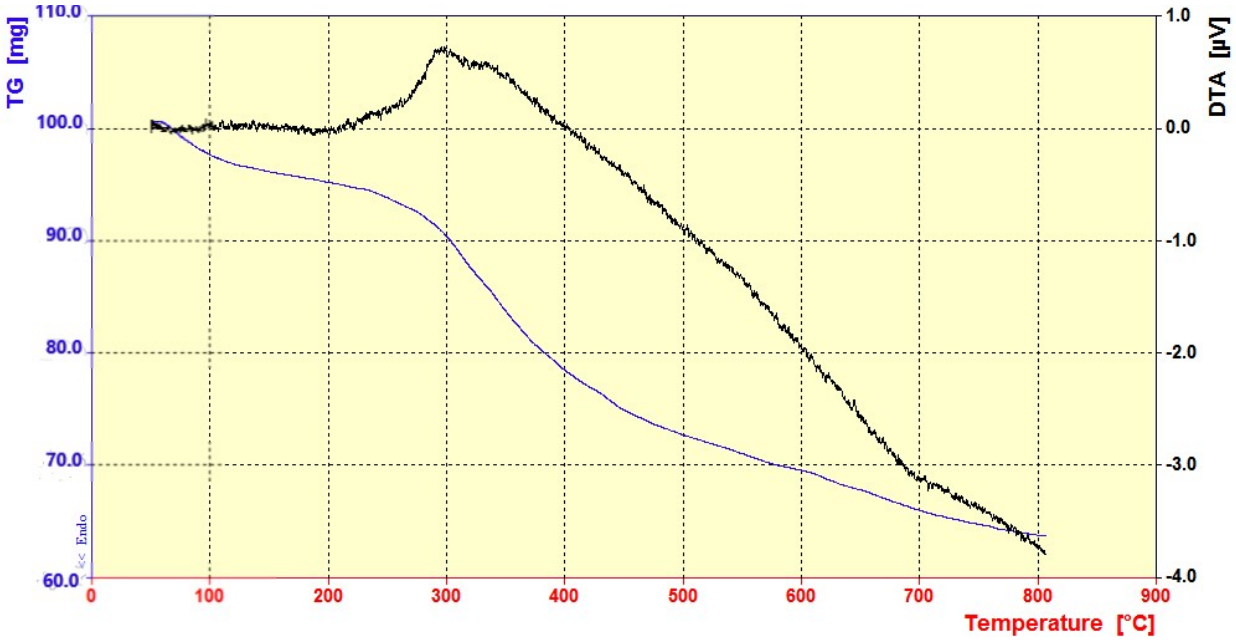

Fig. S6. TGA and DTA curves for the Cu@EDTAD-PMO nanomaterial (1).

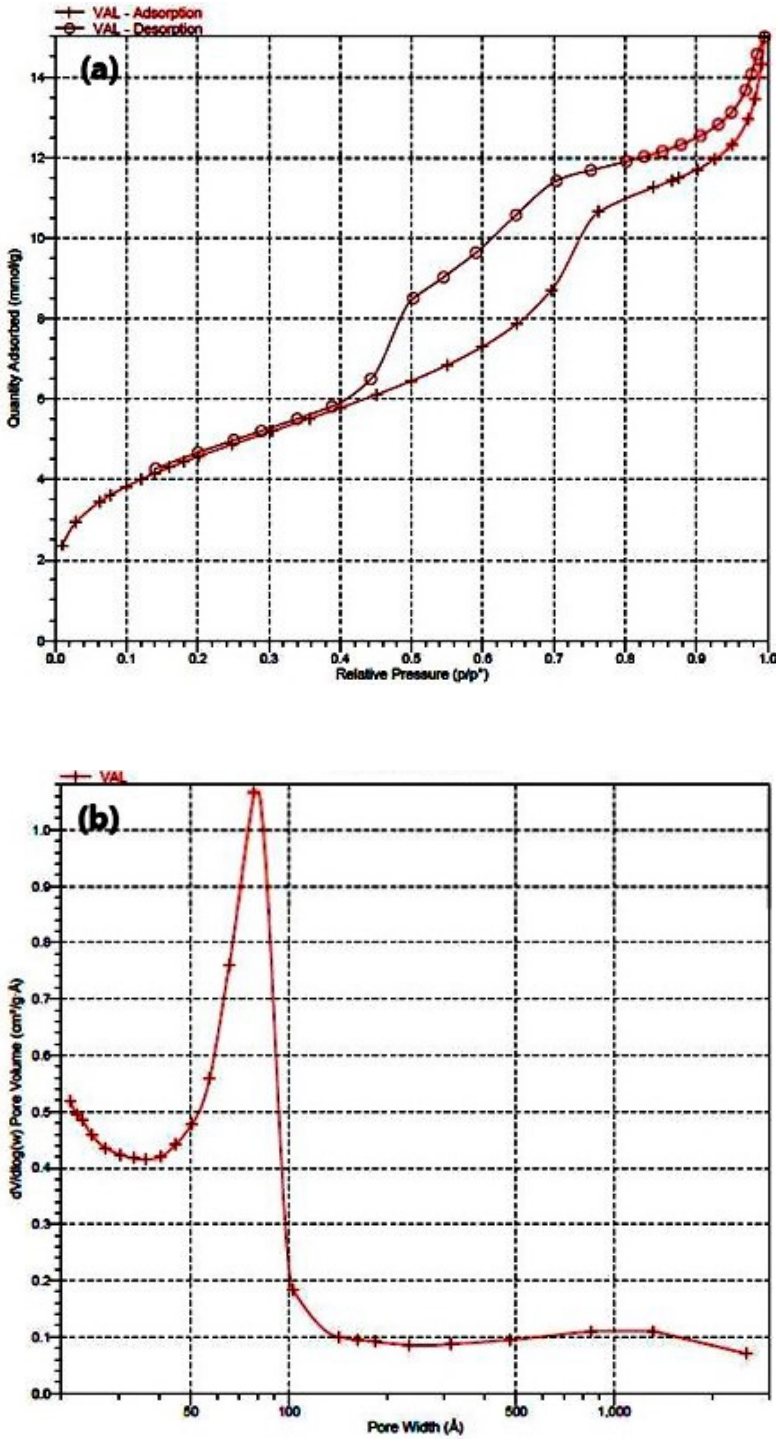

Fig. S7. (**a**) N_2 adsorption–desorption, and (**b**) pore size distribution isotherms of the Cu@EDTAD-PMO mesoporous material (**1**).

*Spectral characterization of compounds **2c** and **2g***

2-(4-methylbenzylidene) malononitrile (2c)

FTIR (KBr, cm^{-1}): 3034, 2962, 2223, 1581, 1554, 1485; ^{1}H NMR (500MHz, $CDCl_3$): δ (ppm) 7.82 (d, J = 8.0 Hz, 2H), 7.73 (s, 1H), 7.34 (d, J = 8.0 Hz, 2H), 2.47 (Me, 3H); ^{13}C NMR (125 MHz, $CDCl_3$) δ (ppm) 146.4, 130.9, 130.3, 128.4, 128.3, 114, 112.8, 81.

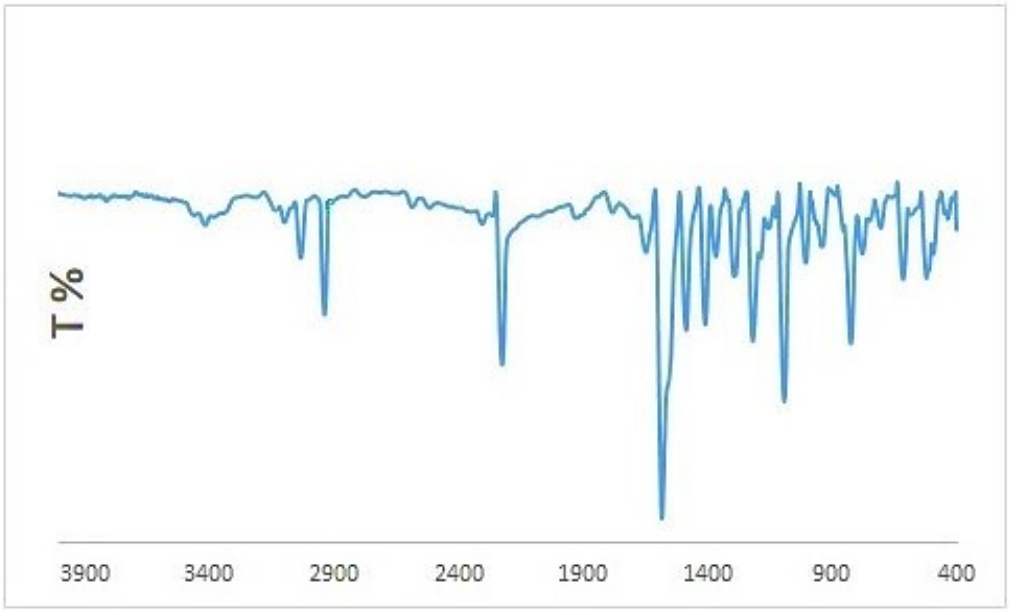

Fig. S8. FTIR of the 2-(4-methylbenzylidene) malononitrile (**2c**).

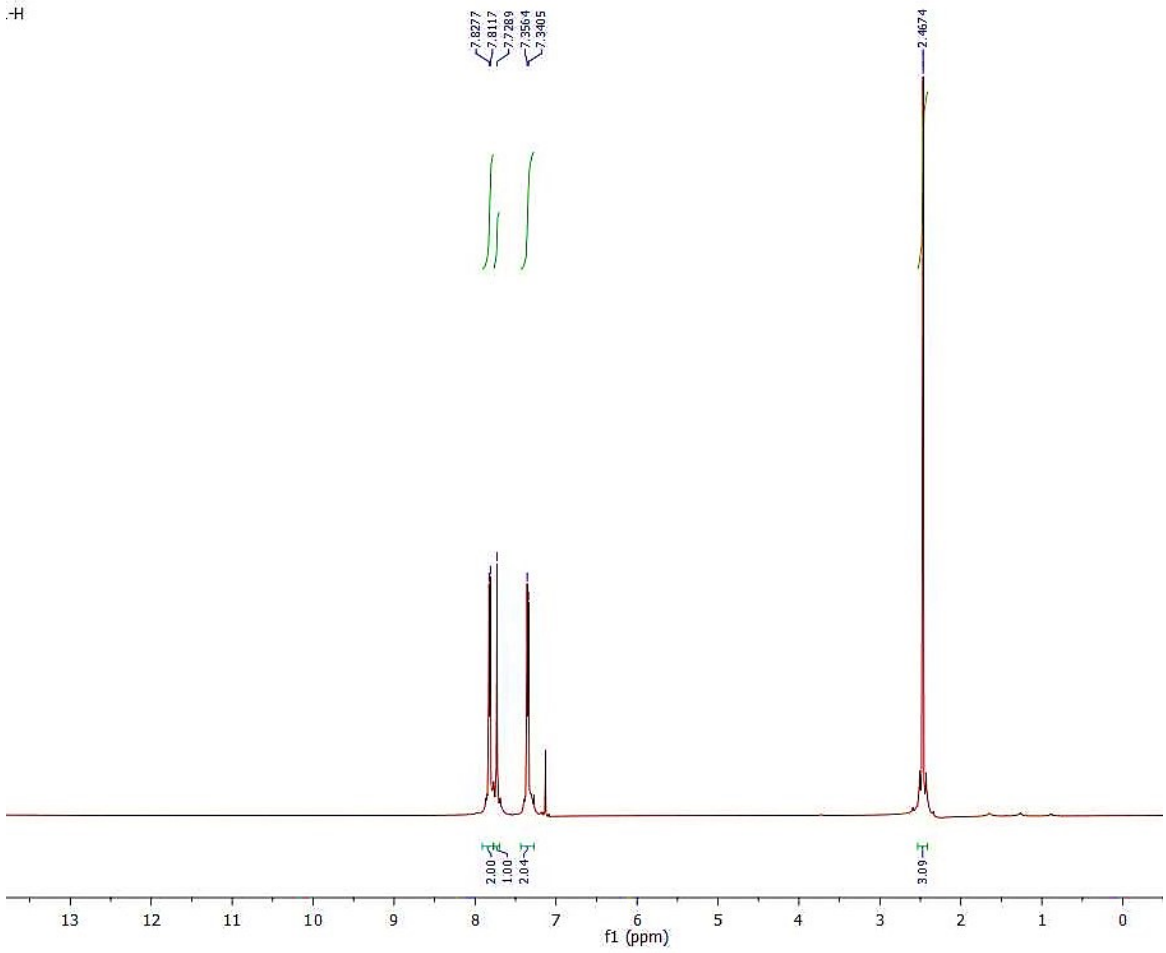

Fig. S9. ^{1}H NMR of the 2-(4-methylbenzylidene)malononitrile (**2c**).

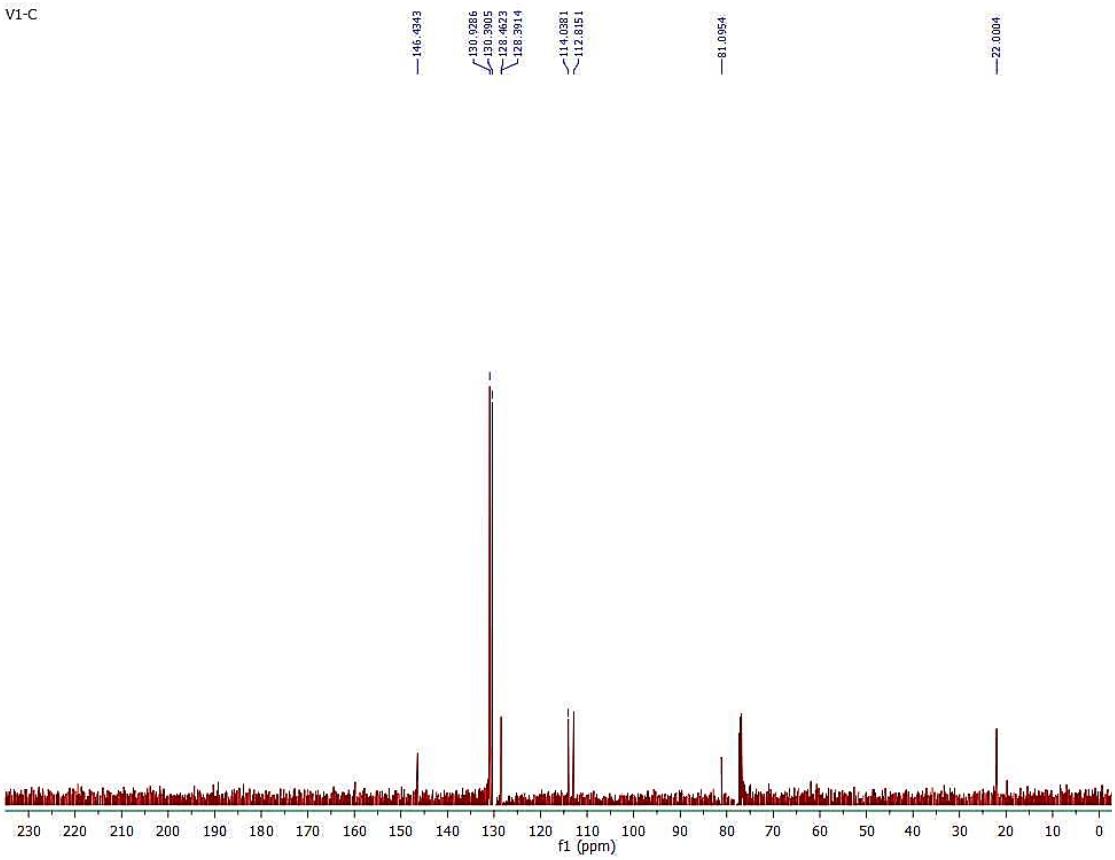

Fig. S10. ^{13}C NMR of the 2-(4-methylbenzylidene)malononitrile (**2c**).

2-(2,4-dicholorobenzylidene)malononitrile (2g)

FTIR (KBr, cm^{-1}): 3097, 3043, 2227, 1577, 1546, 1461; ^{1}HNMR (500MHz, $CDCl_3$): δ (ppm) 8.19 (s, 1H), 8.15 (d, *J* = 8.5 Hz, 1H), 7.5 (s, 1H), 7.4 (d, *J* = 8.5 Hz, 1H); ^{13}C NMR (125 MHz, $CDCl_3$) δ (ppm) 154.6, 141, 137.1, 130.7, 130.2, 128.3, 127.5, 113, 111.8, 85.9.

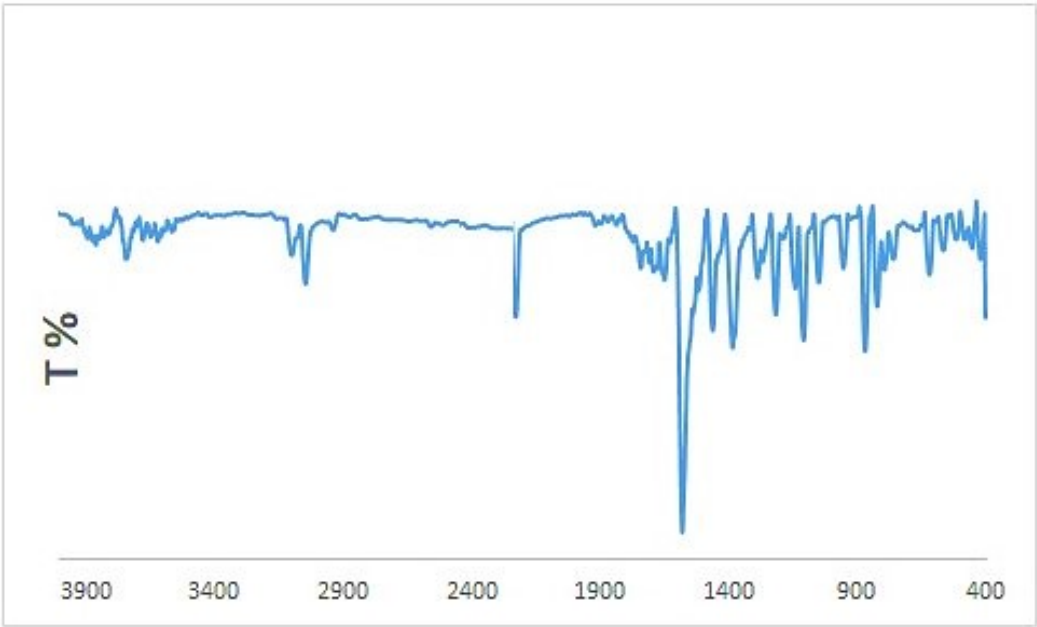

Fig. S11. FTIR of the 2-(2,4-dicholorobenzylidene)malononitrile (**2g**).

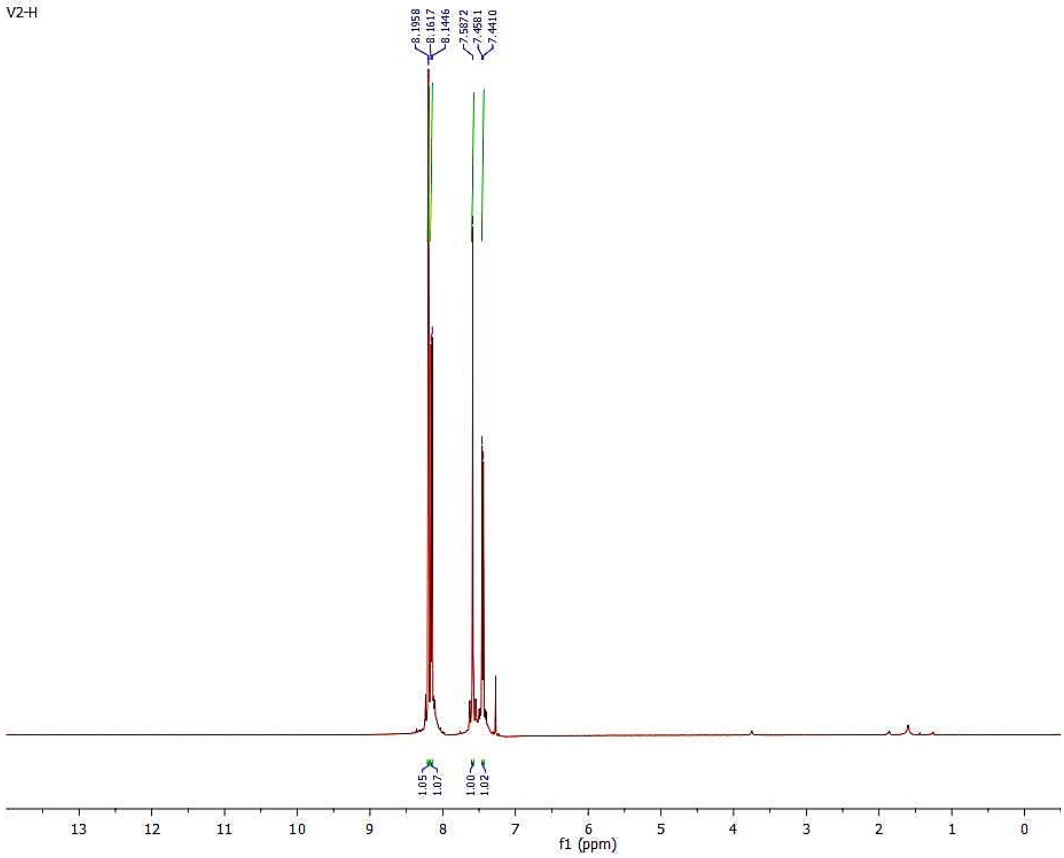

Fig. S12. [1]HNMR of the 2-(2,4-dicholorobenzylidene)malononitrile (**2g**).

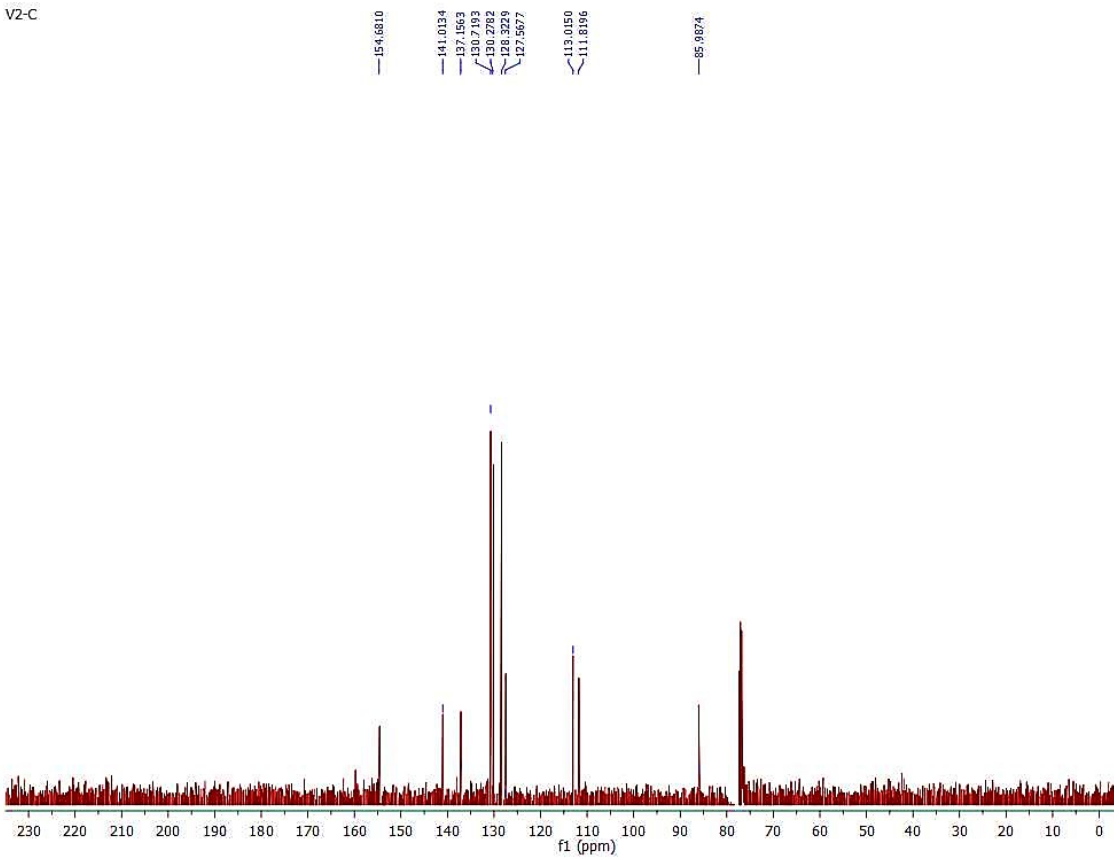

Fig.S13. ^{13}C NMR of the 2-(2,4-dicholorobenzylidene)malononitrile (**2g**).