Electronic Supplementary Material (ESI) for Nanoscale Advances.

Supporting Information

Pyromellitic diamide-diacid bridged mesoporous organosilica nanospheres with controllable morphologies: A novel PMO for the facile and expeditious synthesis of imidazole derivatives

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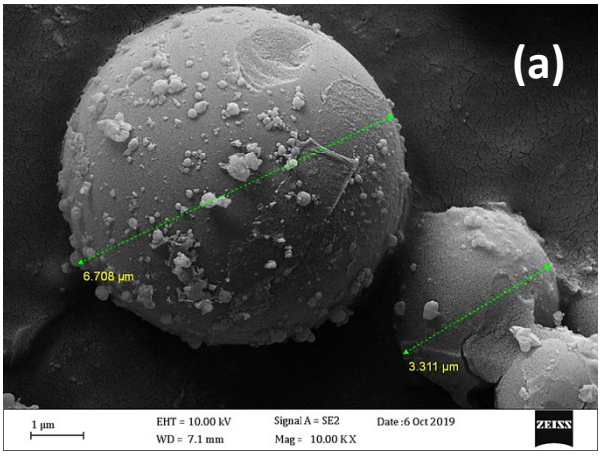

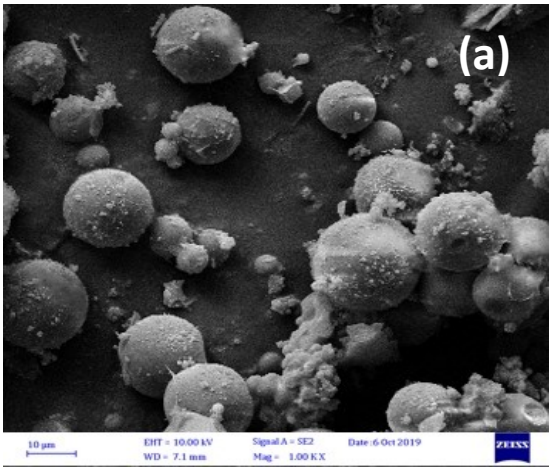

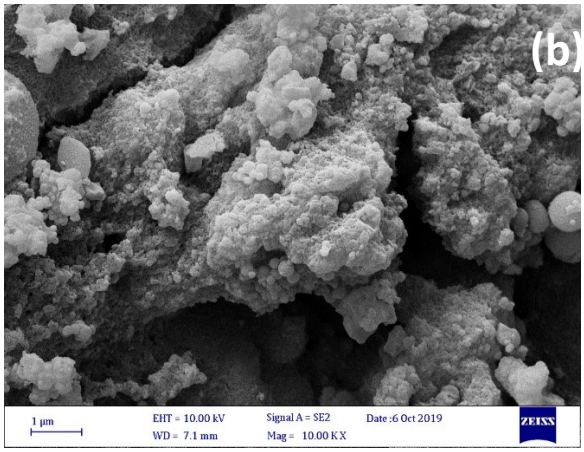

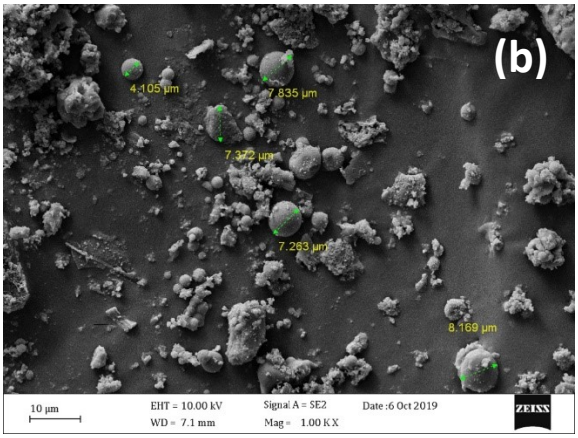

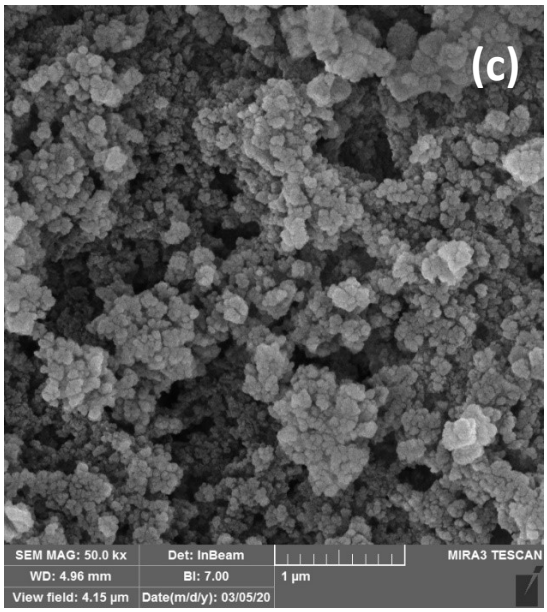
(c)
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BI: 7.00
1 µm
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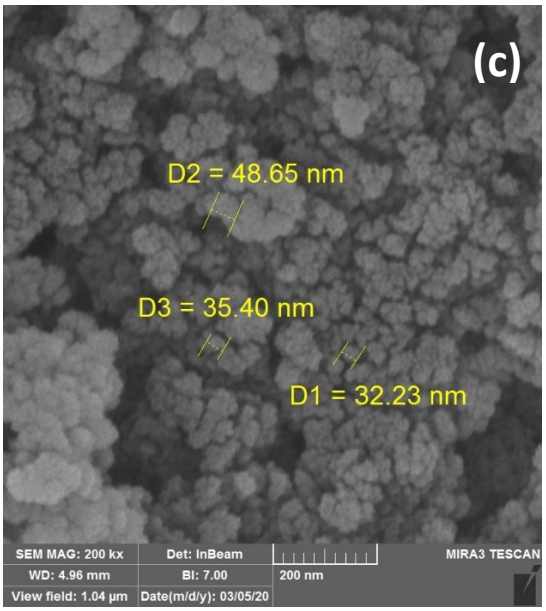
Date(m/d/y): 03/05/20


(c)
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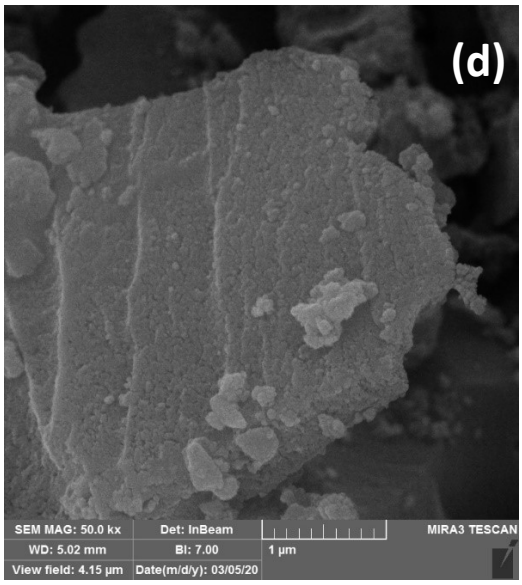
(d)
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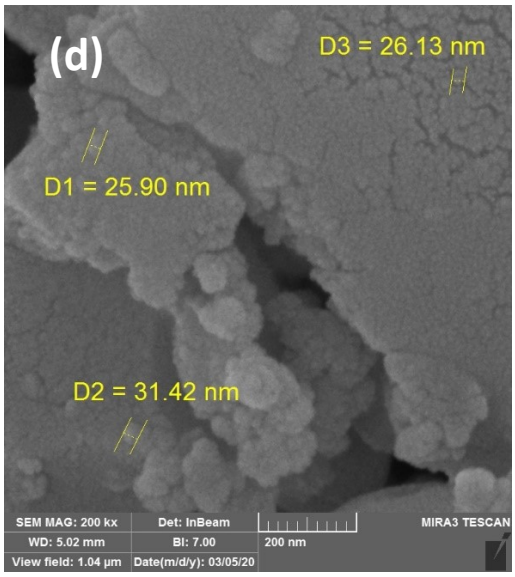
(d)
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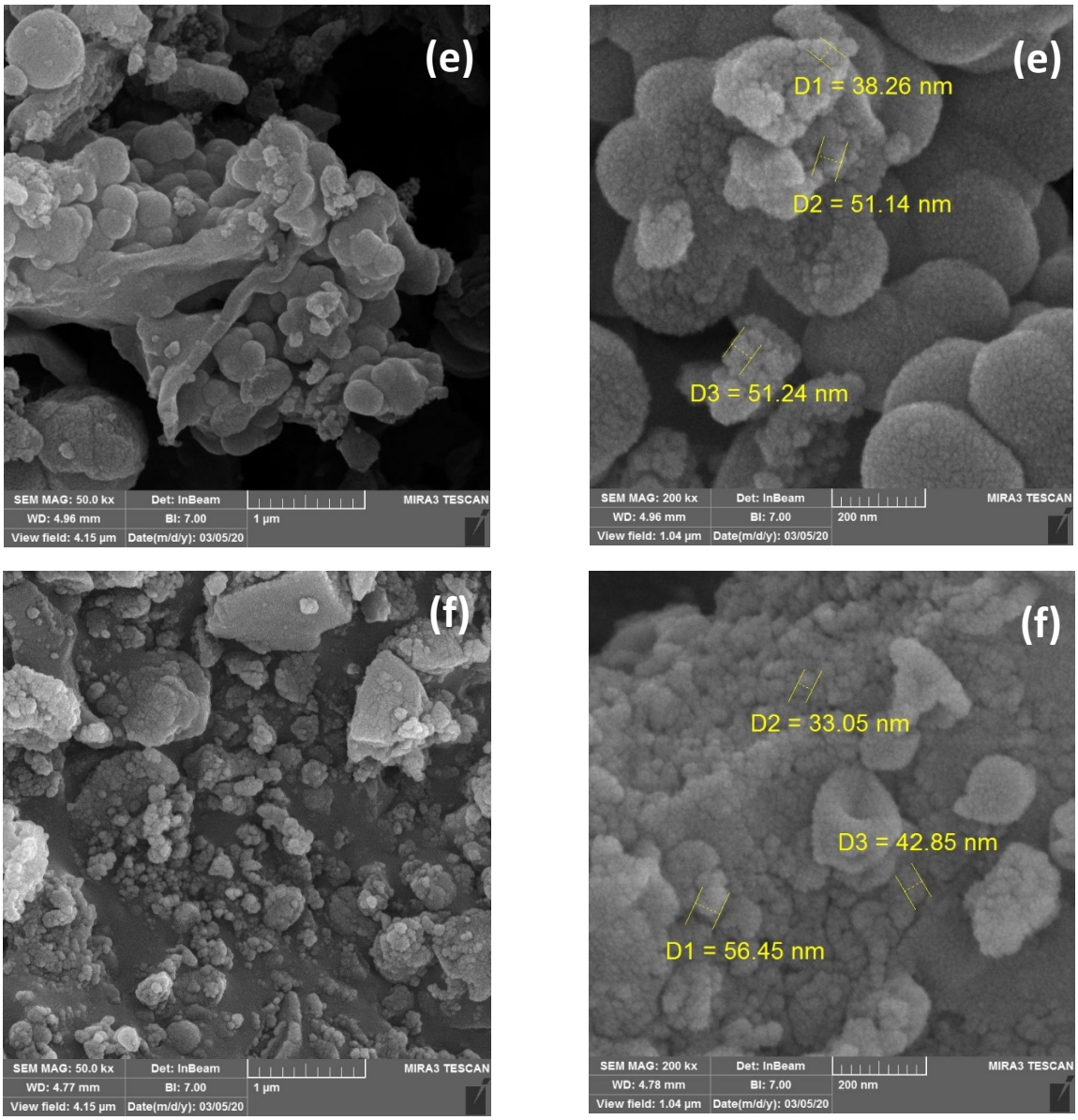
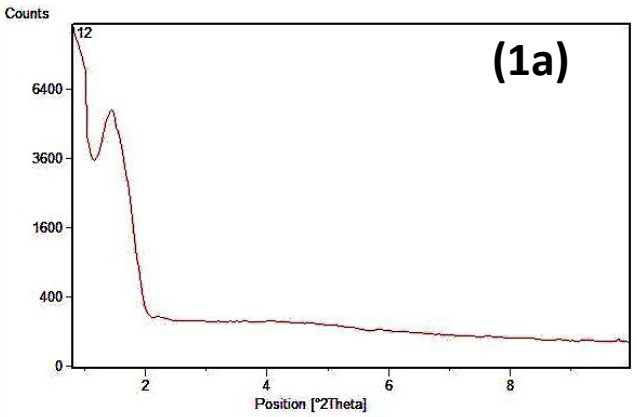


S 1. FESEM images of PMAMOS (**1**) obtained using the precursor **I** prepared in THF (a) or DMF solvent (b), and the precursor **I** was prepared in THF and subsequently dispersed in acetone (c) with the simultaneous addition of precursor **I** and TEOS to the mixture of HCl and Pluronic P123. PMDADA precursor (**I**) was dissolved in the acidic solution of HCl and Pluronic P123, then TEOS was added dropwise (d). CTAB was dissolved in ammonia and used as template (e). Similar conditions to the PMAMOSa but with 48 h aging time (f).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3600
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400
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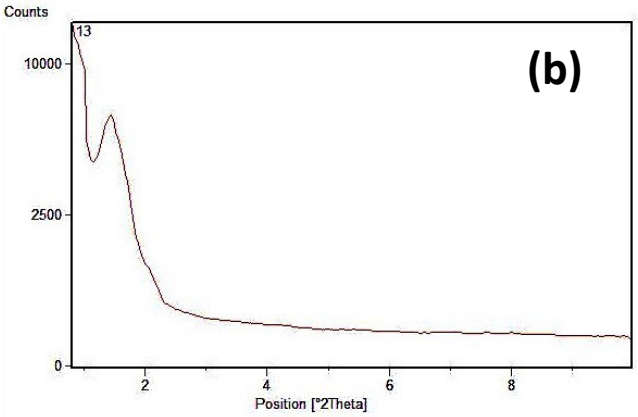
2
4
6
8
Position [°2Theta]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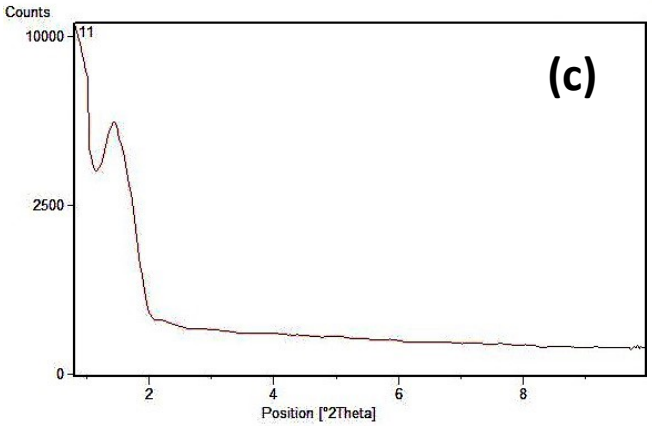
6
8
Position [°2Theta]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(c)
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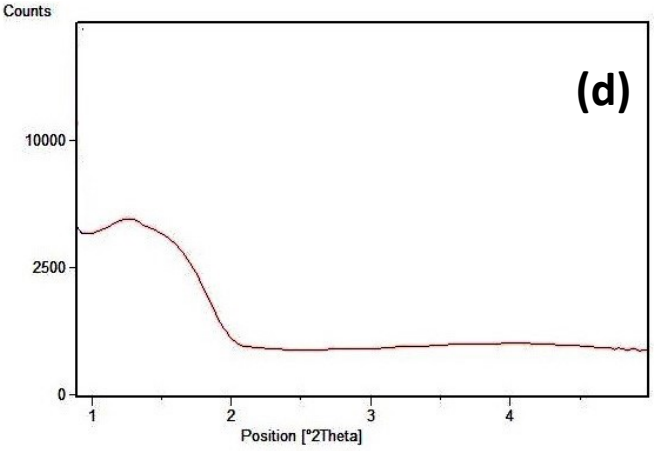
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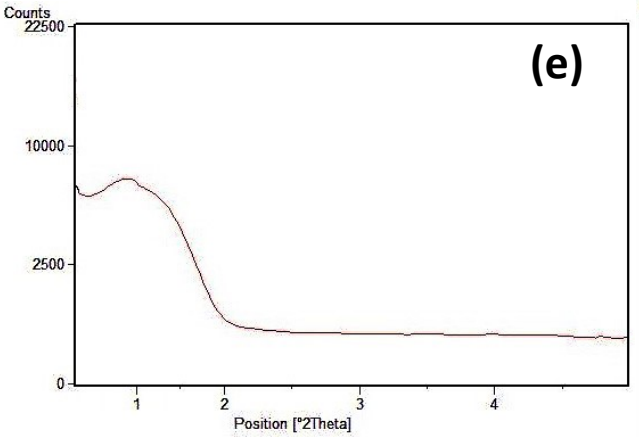
3
4
Position [°2Theta]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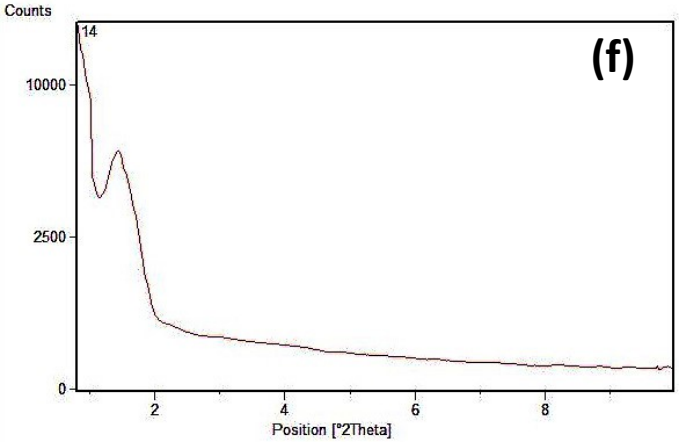
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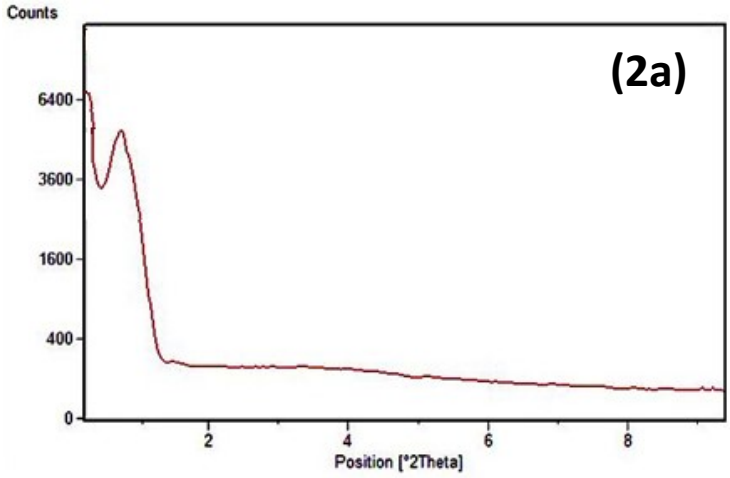
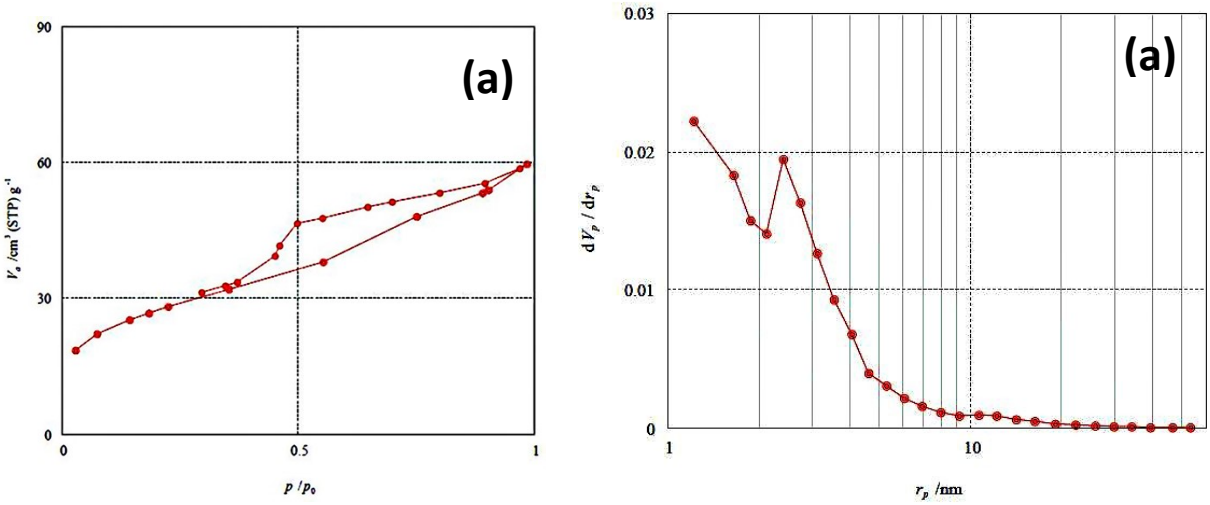
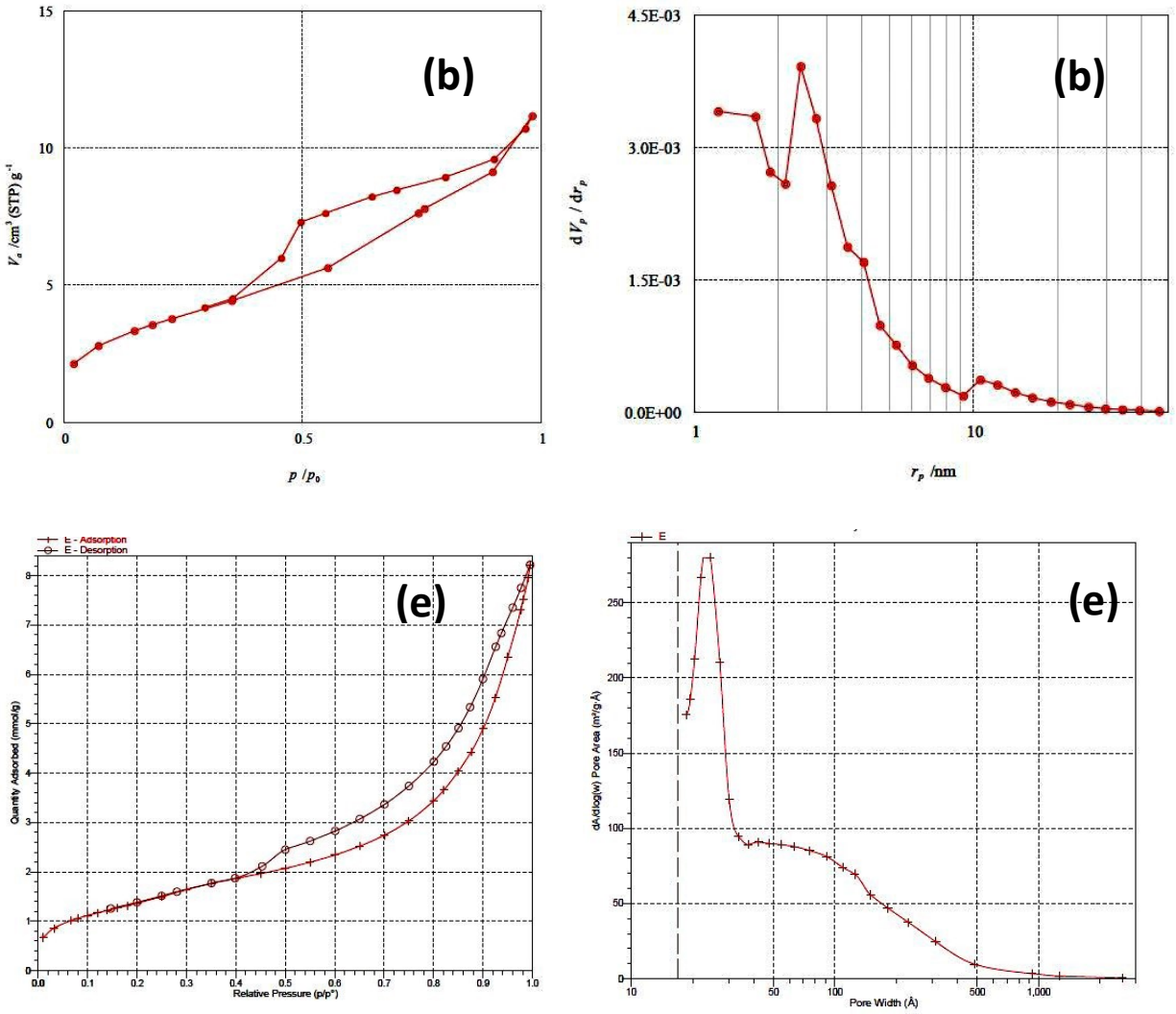
Position [°2Theta]

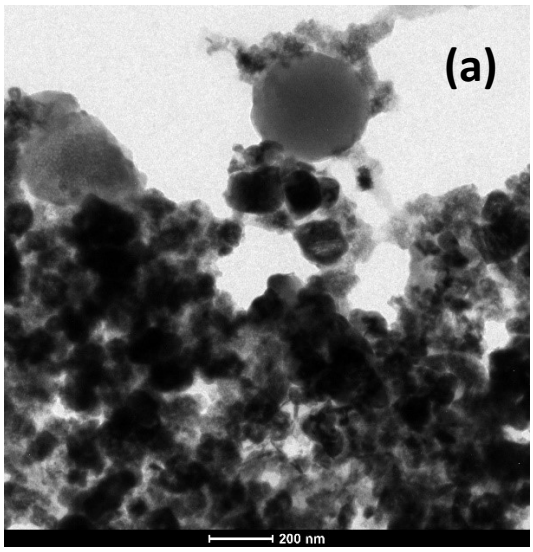


S2. Fig. 2 (**A**) Low-angle XRD patterns of PMAMOS (**1**) obtained using the precursor **I** prepared in THF (a) or DMF solvent (b), and the precursor **I** was prepared in THF and subsequently dispersed in acetone (c) with the simultaneous addition of precursor **I** and TEOS to the mixture of HCl and Pluronic P123. PMDADA precursor (**I**) was dissolved in the acidic solution of HCl and Pluronic P123, then TEOS was added dropwise (d). CTAB was dissolved in ammonia and used as template (e). Similar conditions to the PMAMOSa but with 48 h aging time (f) PMAMOSa after the five-times recycling (2a).





S3. N_2 adsorption-desorption isotherms of PMAMOSa,b,e (1) obtained using the PMDADA precursor I prepared in THF (a) or DMF solvent (b) with the simultaneous addition of precursor I and TEOS to the mixture of HCl and Pluronic P123. CTAB was dissolved in ammonia and used as template (e).


(a)
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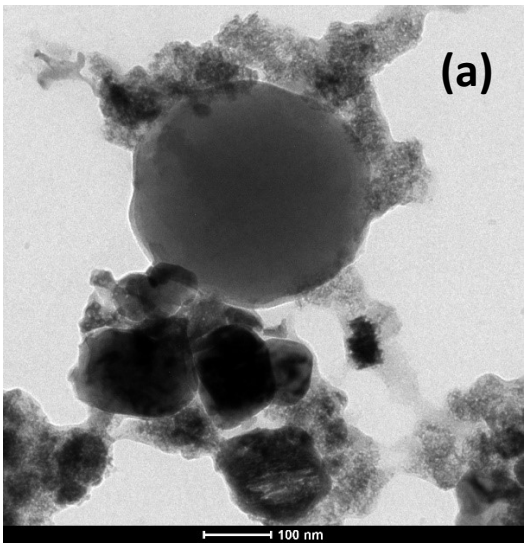
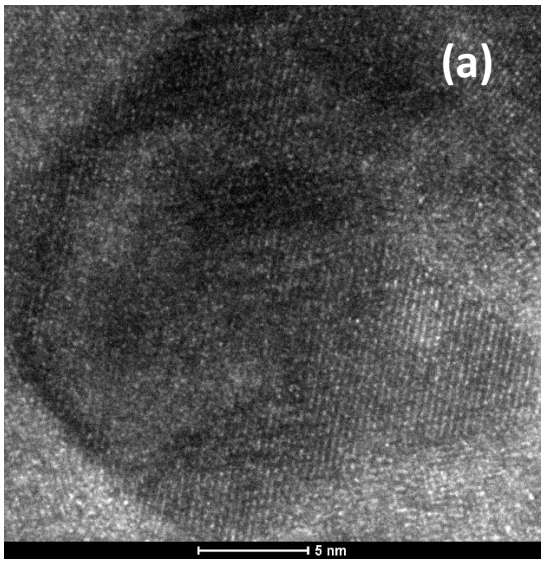
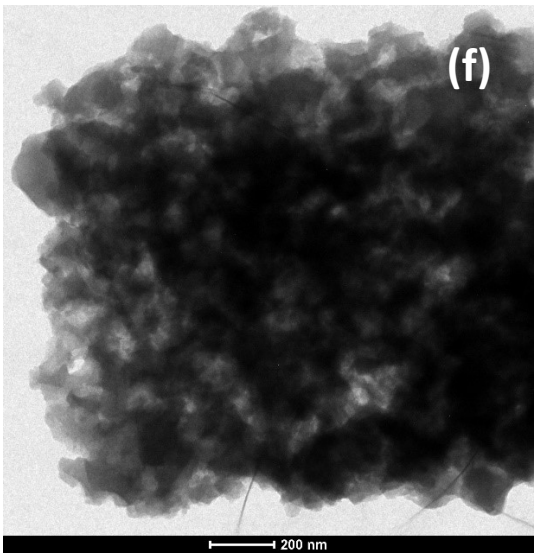
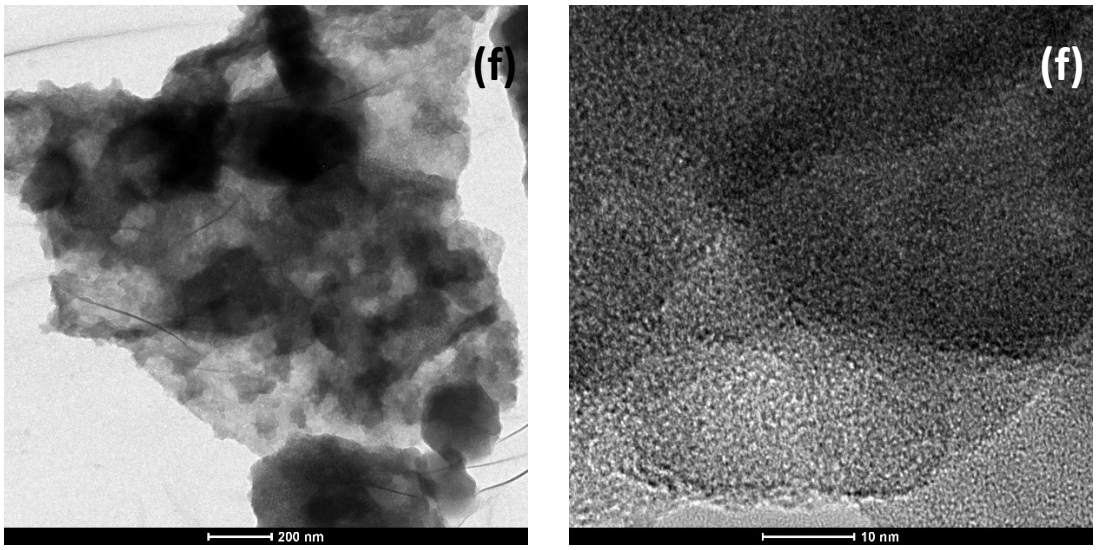
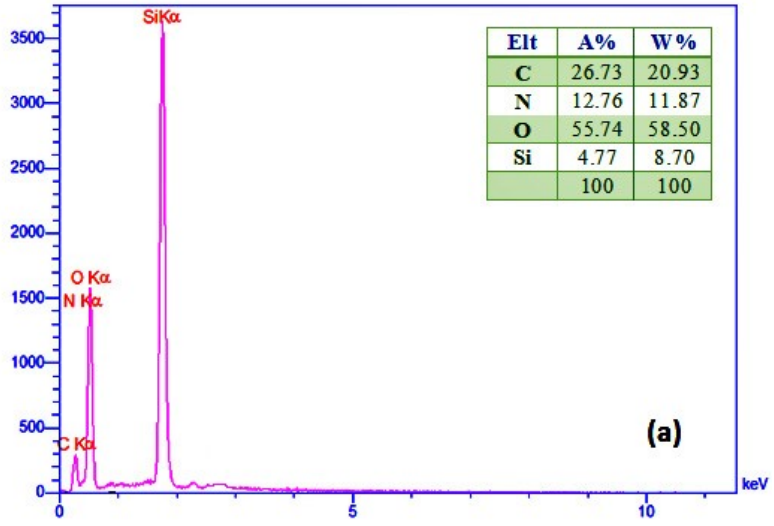

(a)
100 nm


(a)
5 nm

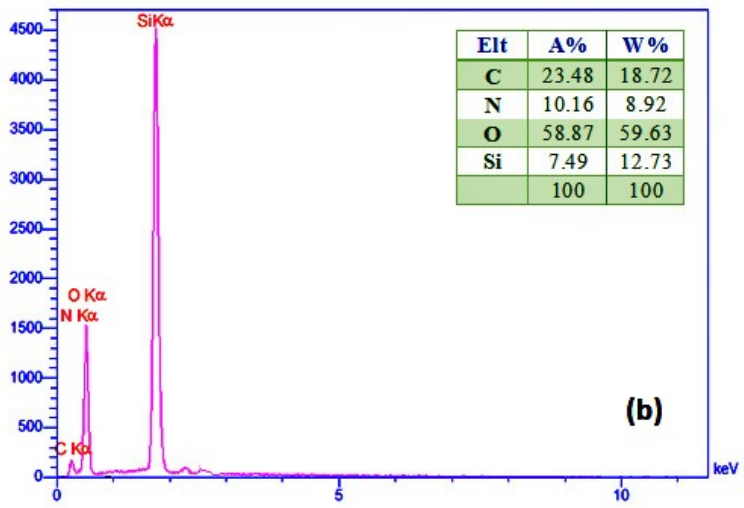

(f)
200 nm



S4. HRTEM image of PMAMOSa,f (1) obtained using the precursor I prepared in THF (a) and Similar conditions to the PMAMOSa but with 48 h aging time (f).

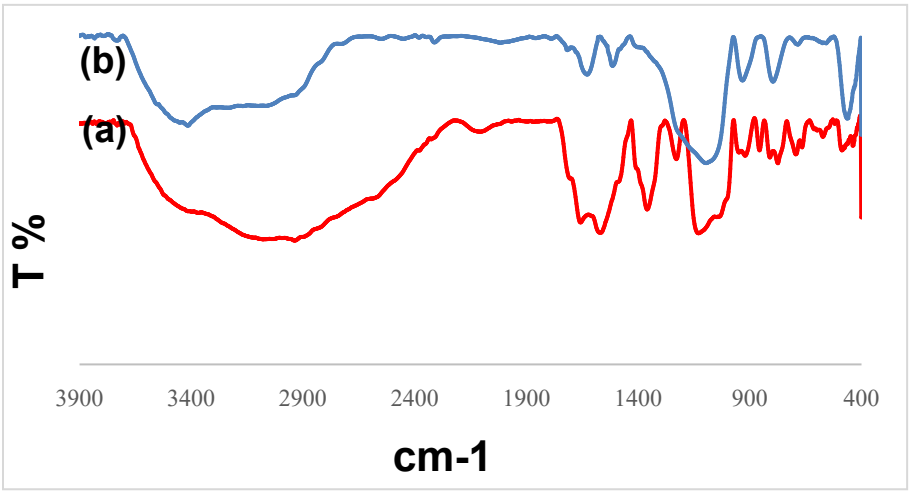


Elt	A%	W%
C	26.73	20.93
N	12.76	11.87
O	55.74	58.50
Si	4.77	8.70
	100	100

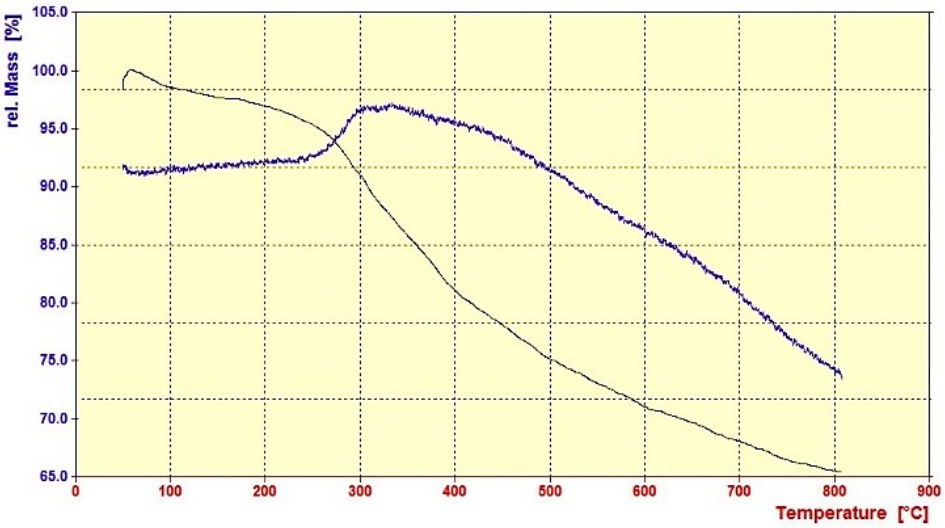


Elt	A%	W%
C	23.48	18.72
N	10.16	8.92
O	58.87	59.63
Si	7.49	12.73
	100	100

S5. EDX spectra of obtained using the precursor I prepared in THF (a) and DMF solvent (b).



S6. FTIR spectra of PMDADA (a) and PMAMOSa-f (1, b).

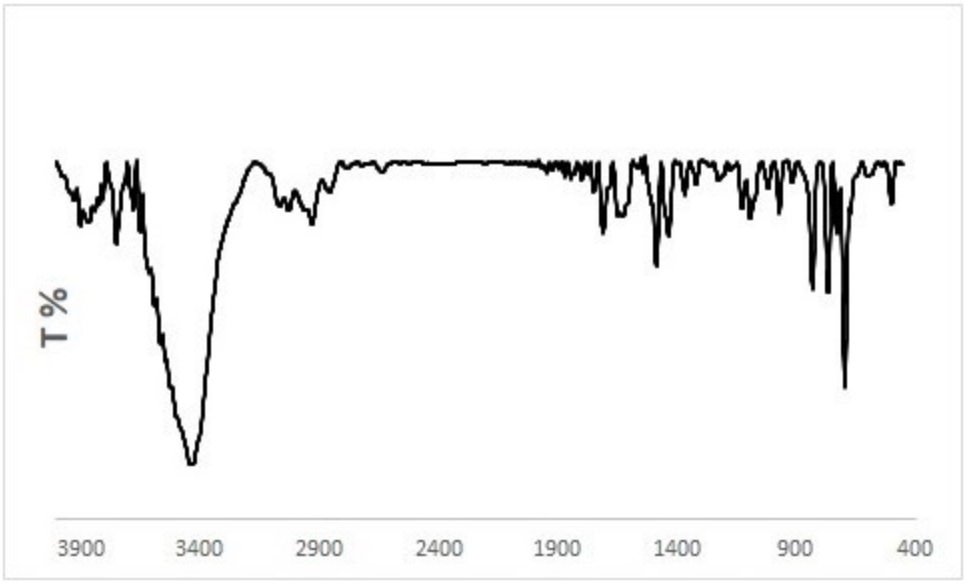


S7. TGA and DTA curves for PMAMOSa (1).

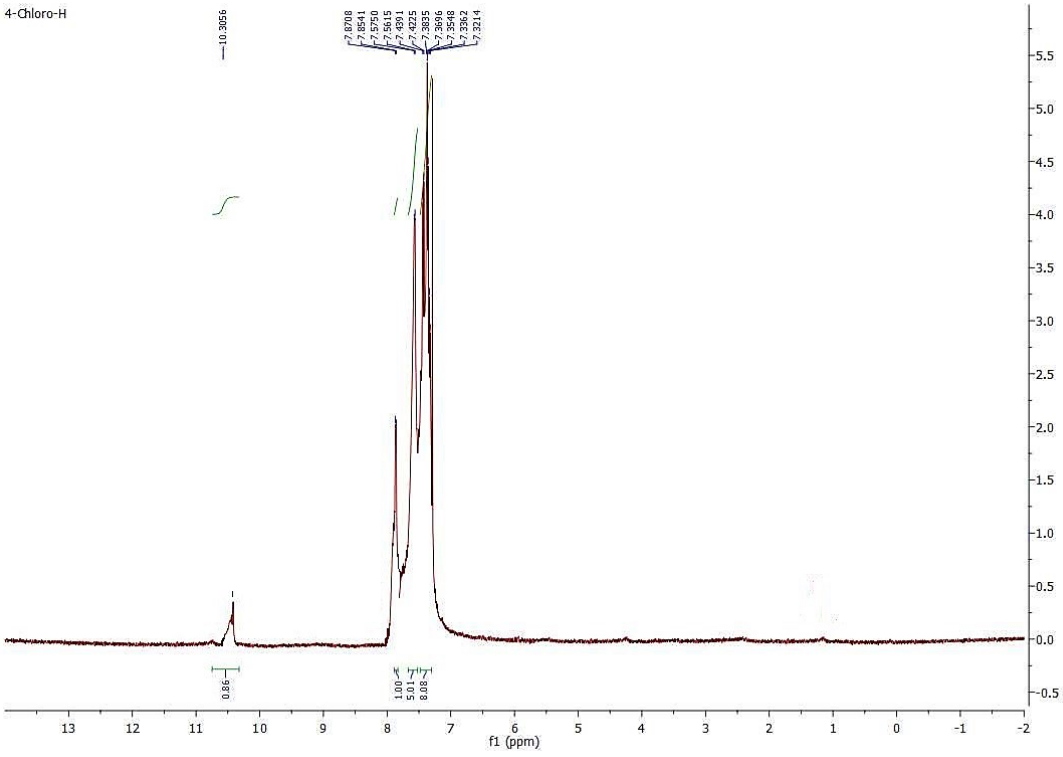
Spectral characterization of compounds 5a and 5b

2-(4-Chlorophenyl)-4,5-diphenyl-1*H*-imidazole (**5a**)

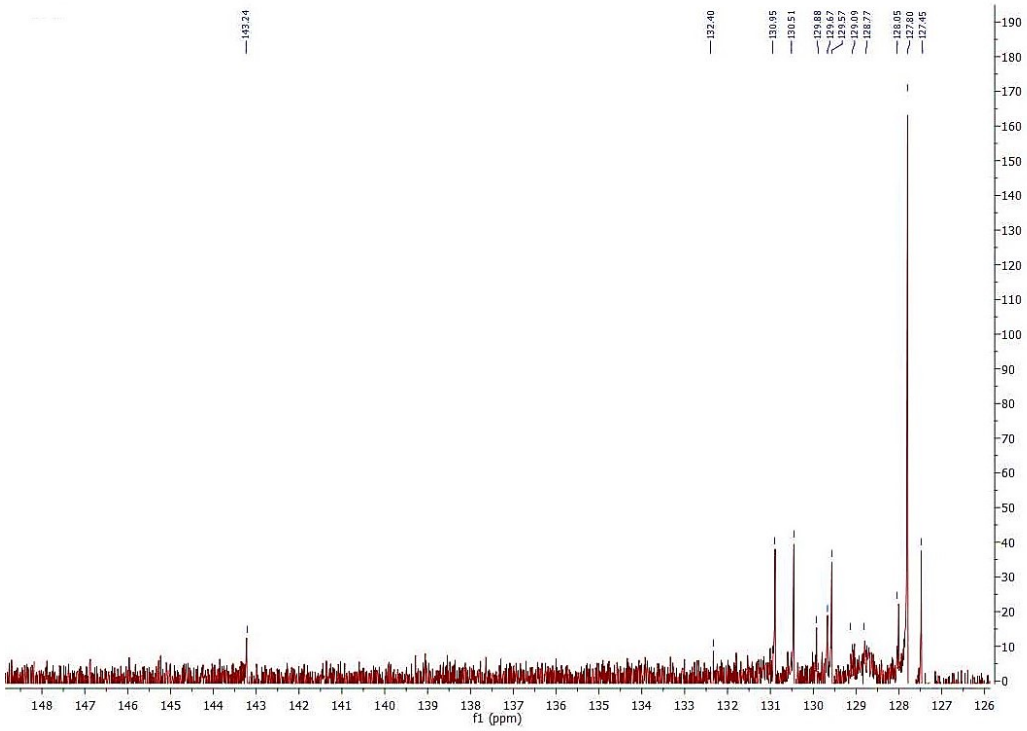
Mp.: 260–263 °C; IR (KBr, cm^{-1}): 3749, 3419, 1630, 1486, 1436, 1368, 1092, 972, 830, 766, 709, 695; ^{1}HNMR(500 MHz,DMSO-d6): δ=7.32–7.85 (m, 13H), 7.87 (s, 1H), 10.30 (br, 1H) ppm; ^{13}C NMR (100 MHz, DMSO-d6): δ = 127.45, 127.48, 128.05, 128.77, 129.09, 129.57, 129.67, 129.88, 130.51, 130.95, 132.40, 143.24 ppm.



S 9. FT-IR of 2-(4-Chlorophenyl)-4,5-diphenyl-1*H*-imidazole.



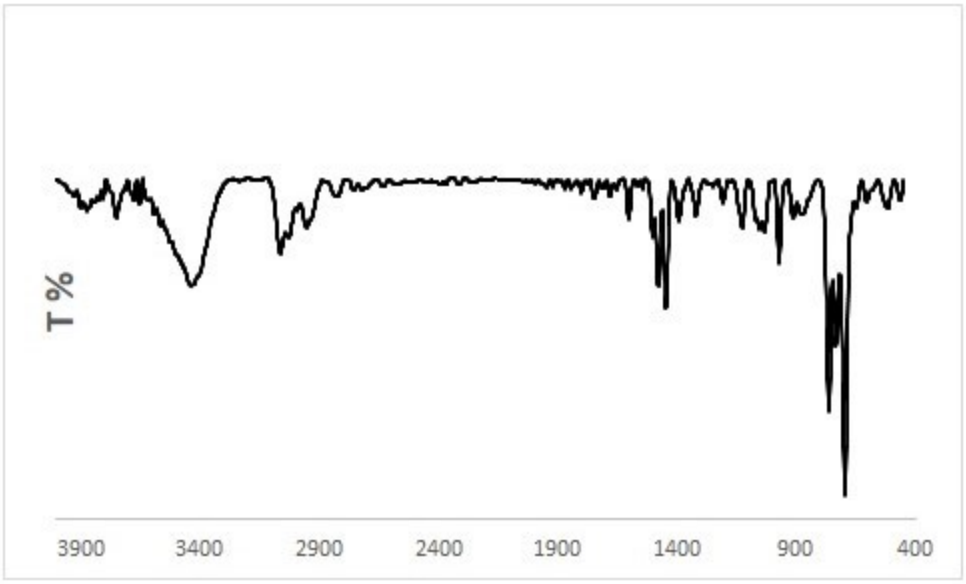
S 10. [1]HNMR of 2-(4-Chlorophenyl)-4,5-diphenyl-1*H*-imidazole.



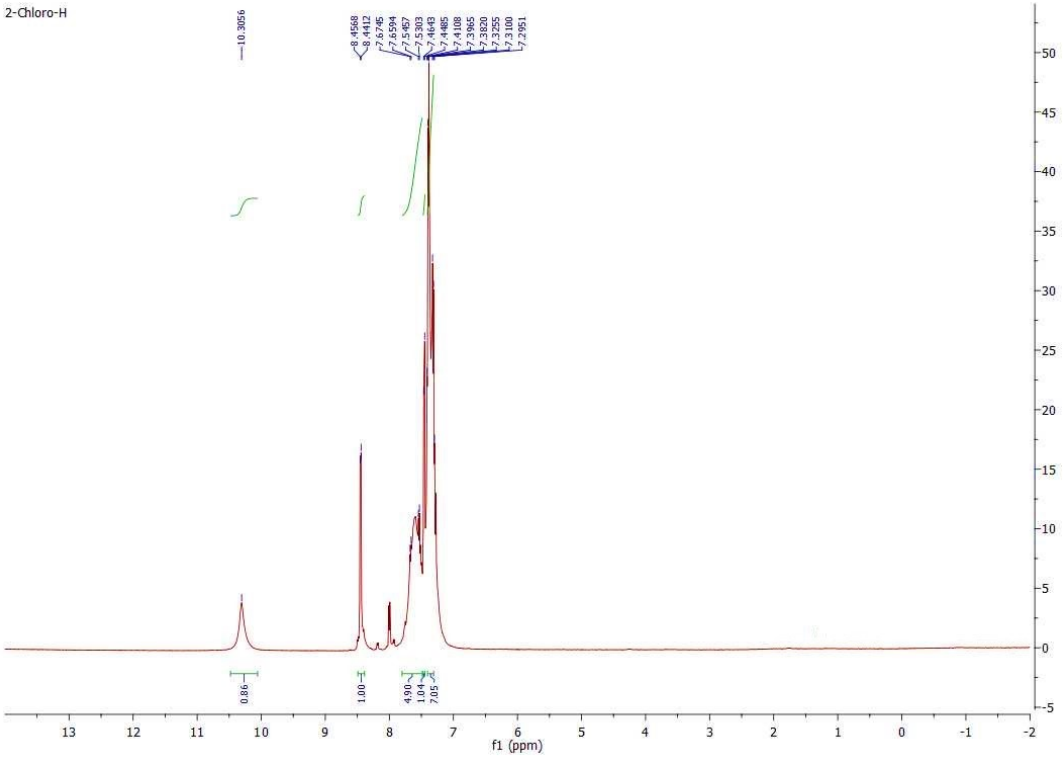
S 11. ^{13}CNMR of 2-(4-Chlorophenyl)-4,5-diphenyl-1*H*-imidazole.

2-(2-Chlorophenyl)-4,5-diphenyl-1*H*-imidazole (**5b**)

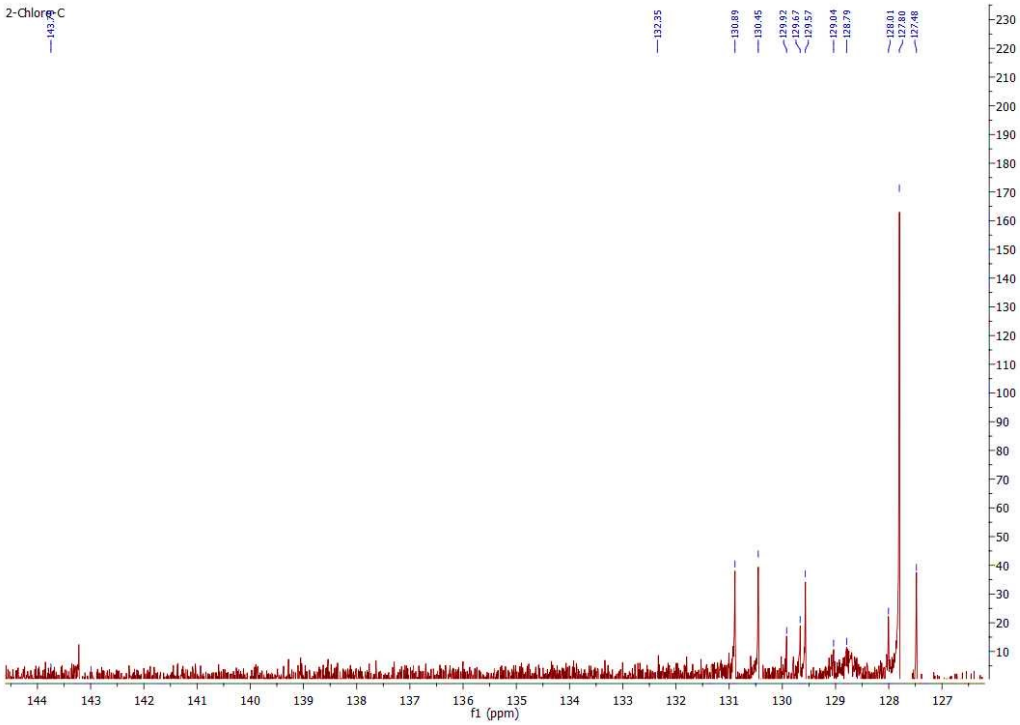
Mp.: 196–198 °C; IR (KBr, cm^{-1}): 3448, 3059, 1601, 1503, 1478, 1320, 1201, 1070, 761, 693, 605; ^{1}H NMR (500 MHz, DMSO-d6): δ = 7.29-746 (m, 7H), 7.5 (d, 1H, *J* = 7.70 Hz), 7.66 (d, 4H, *J* = 7.55 Hz), 8.46 (d, 1H, *J* = 7.80 Hz), 10.3 (br, 1H) ppm; ^{13}CNMR(100 MHz,DMSO-d6): δ =127.48, 127.80, 128.01, 128.79, 129.04, 129.57, 129.67, 129.92, 130.45, 130.89, 132.35, 143.75 ppm.



S 12. FT-IR of 2-(2-Chlorophenyl)-4,5-diphenyl-1*H*-imidazole.



S 13. [1]HNMR of 2-(2-Chlorophenyl)-4,5-diphenyl-1*H*-imidazole.



S 14. ^{13}CNMR of 2-(2-Chlorophenyl)-4,5-diphenyl-1*H*-imidazole.