Electronic Supplementary Information

Optimization of the time and temperature of the microwave-assisted amination of the phenylene-PMO

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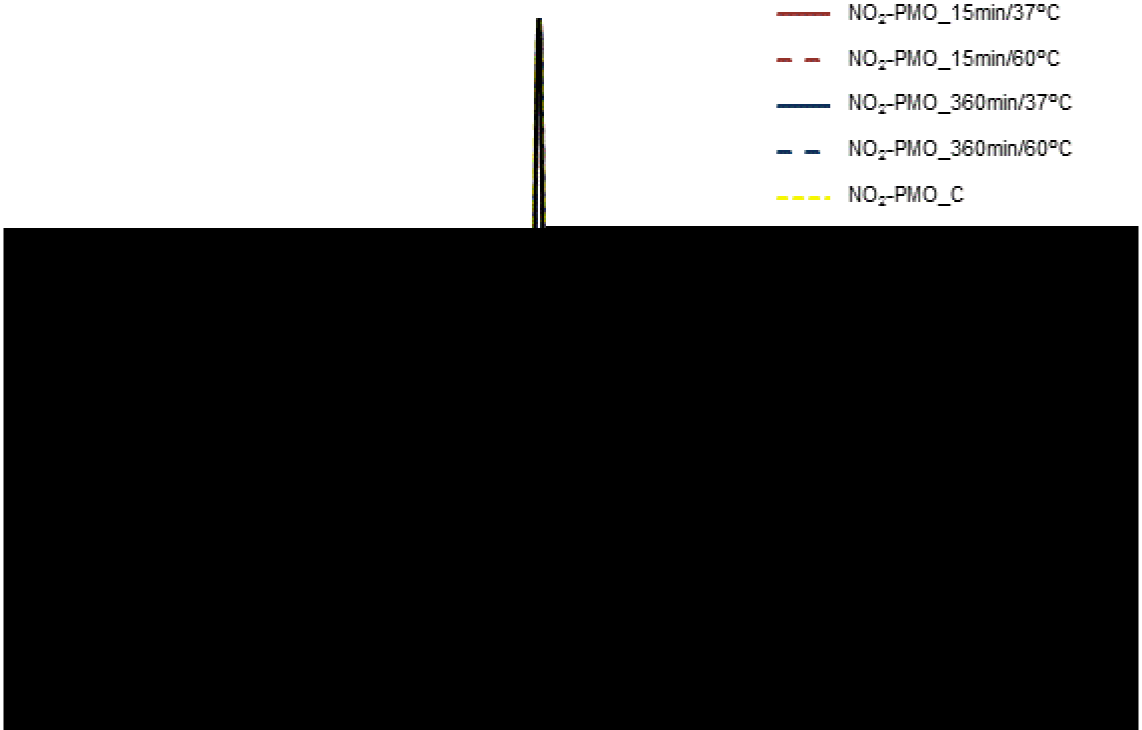
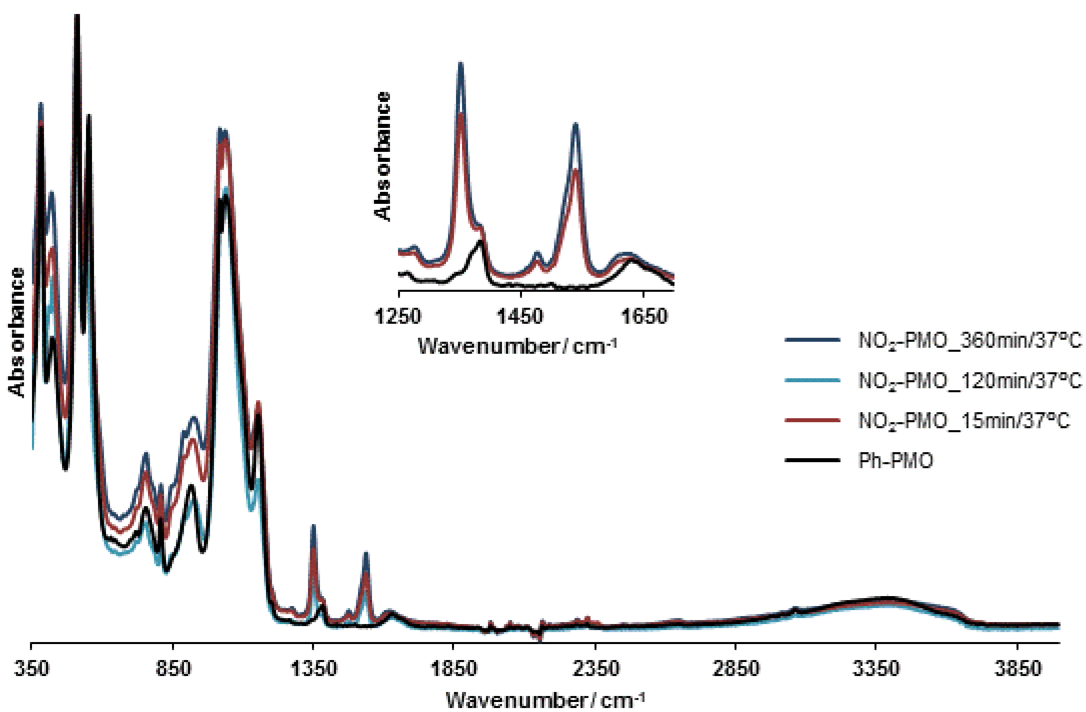


Figure S1. ^{13}C CP MAS NMR spectra for PMO and NO_2-PMO_*x*/*y* samples obtained under different synthetic conditions. * denotes spinning sidebands.

a)



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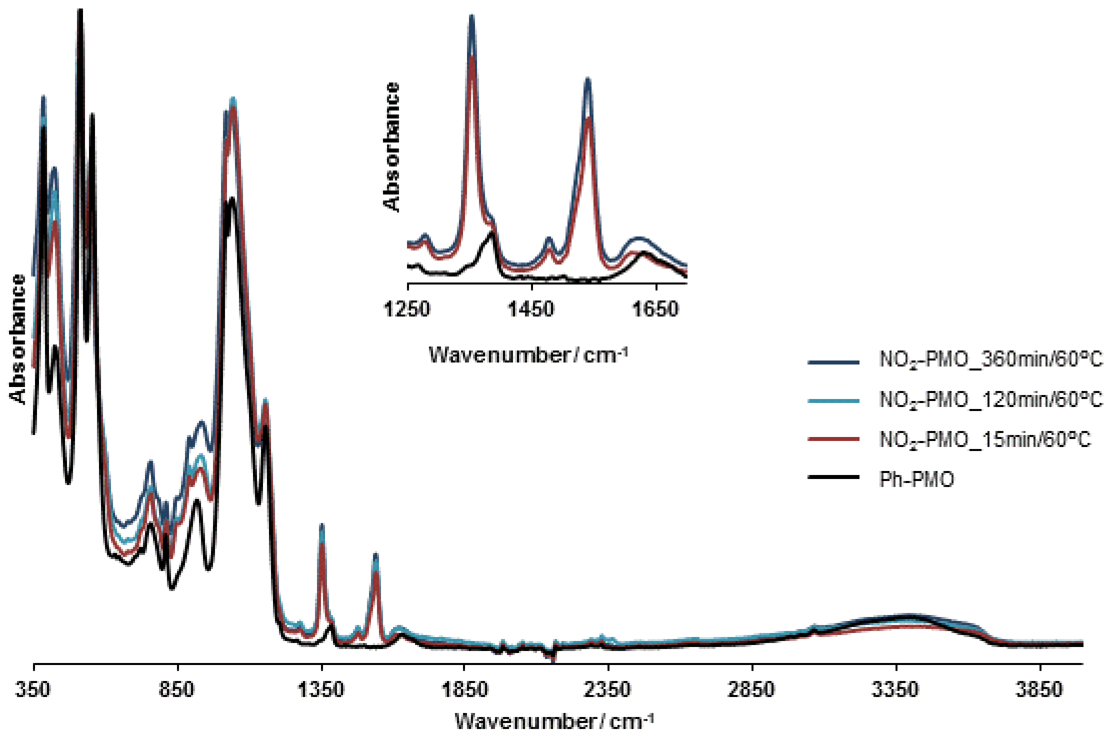
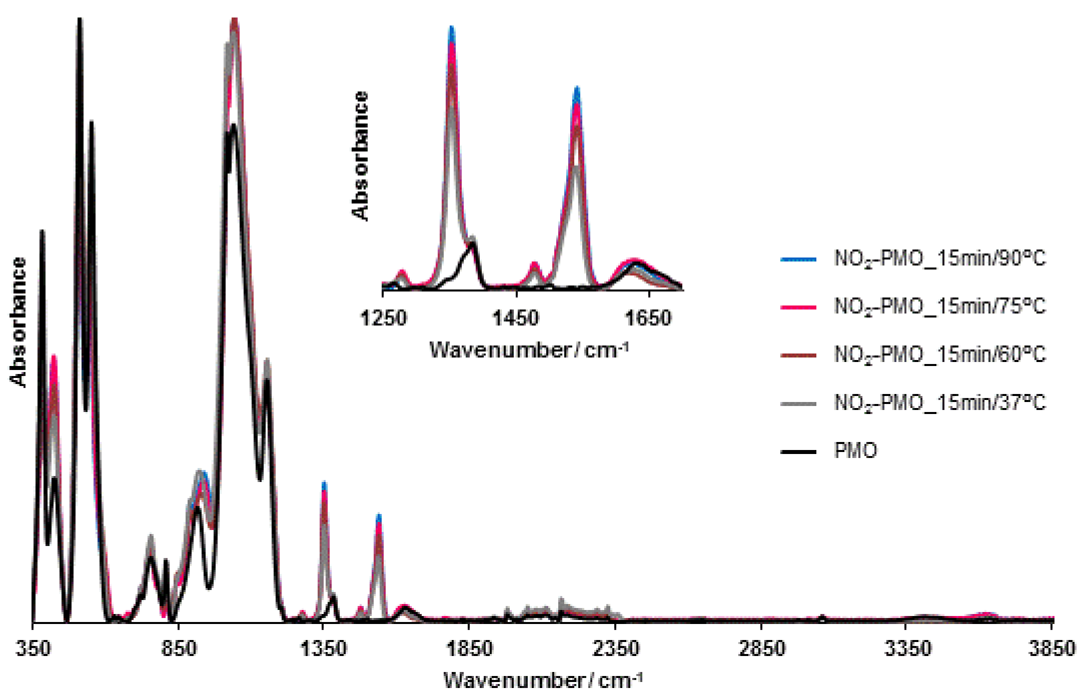

Absorbance
Wavenumber / cm-1
350
850
1350
1850
2350
2850
3350
3850
Absorbance
Wavenumber / cm-1
1250
1450
1650
NO2-PMO_360min/60°C
NO2-PMO_120min/60°C
NO2-PMO_15min/60°C
Ph-PMO

c)


Absorbance
Wavenumber / cm-1
350
850
1350
1850
2350
2850
3350
3850
Absorbance
Wavenumber / cm-1
1250
1450
1650
NO2-PMO_15min/90°C
NO2-PMO_15min/75°C
NO2-PMO_15min/60°C
NO2-PMO_15min/37°C
PMO

d)

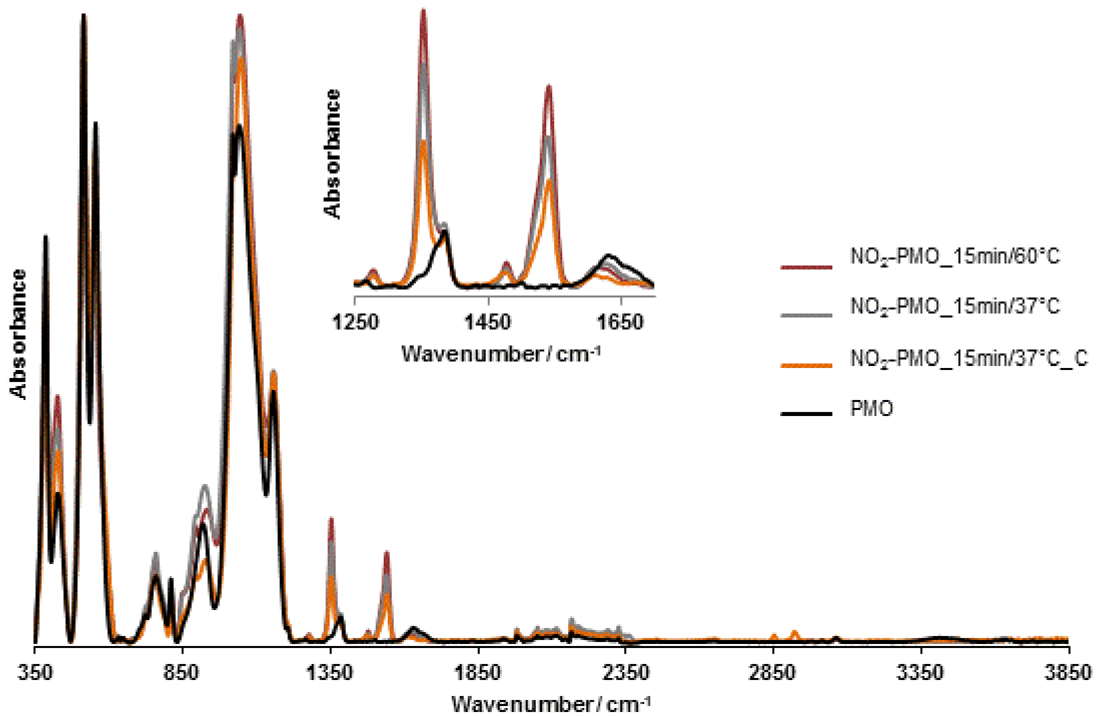


Figure S2. FTIR (ATR) spectra of PMO, NO_2-PMO_*x*/*y* at a) 37 ºC and b) 60 ºC for different reaction times, c) NO_2-PMO_15min/*y* at different temperatures and d) NO_2-PMO_15min/*y* at different temperatures using microwave and conventional heating. The insets display the region 1250 – 1700 cm^{-1} magn

ified.

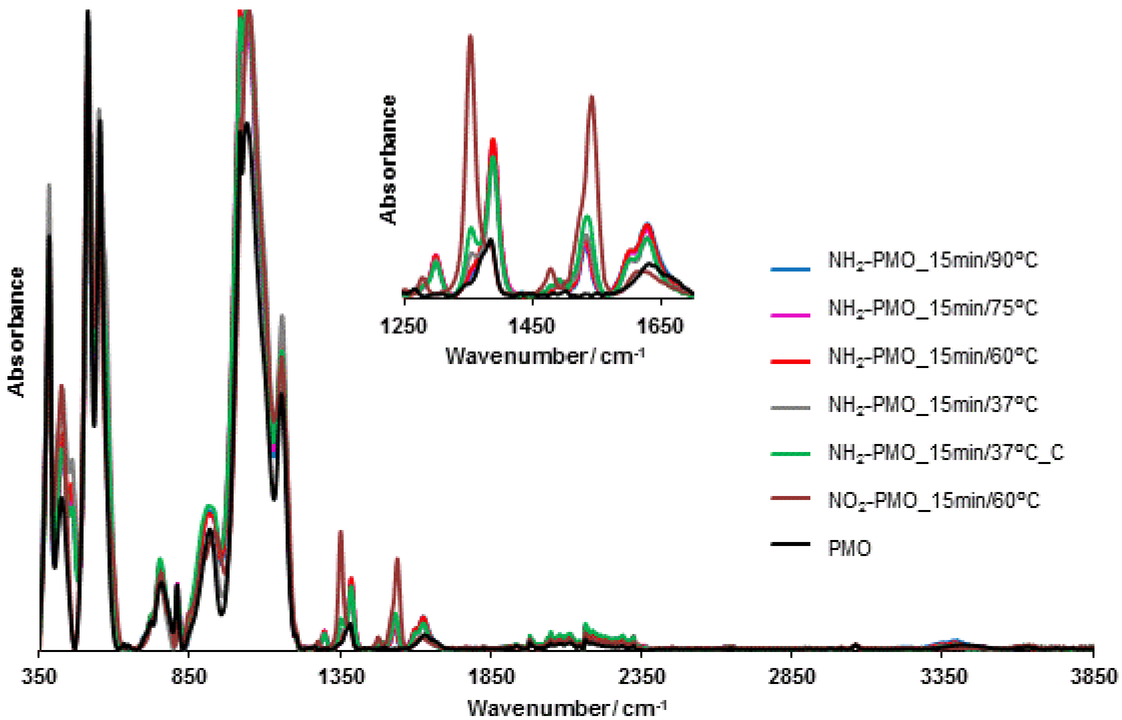


Figure S3. FTIR (ATR) spectra of PMO, NO_2-PMO_15min/60ºC and NH_2-PMO_15min/*y* at different temperatures. The insets display the region 1250 – 1700 cm^{-1} magnified.

Table S1. Textural parameters and physical properties of PMO and NO_2-PMOs_*x*/*y*.

Sample	d_{100} / nm	a / nm[a]	S_{BET} / m^2 g^{-1}	V_P / cm^3 g^{-1}	d_p / nm[b]	b / nm[c]
PMO	4.55	5.25	920	0.66	3.58	1.67
NO_2-PMO_15min/37°C	4.70	5.42	788	0.62	3.58	1.84
NO_2-PMO_120min/37°C	4.50	5.20	757	0.58	3.51	1.69
NO_2-PMO_360min/37°C	4.65	5.36	626	0.49	3.51	1.85
NO_2-PMO_15min/60°C	4.70	5.42	698	0.57	3.54	1.88
NO_2-PMO_120min/60°C	4.55	5.25	743	0.57	3.51	1.74
NO_2-PMO_360min/60°C	4.55	5.25	808	0.63	3.51	1.74
NO_2-PMO_15min/75°C	4.82	5.57	730	0.61	3.69	1.88
NO_2-PMO_15min/90°C	4.82	5.57	776	0.65	3.55	2.02

[a]Unit cell parameter calculated as($2d_{100}/\sqrt{3}$) . [b]Pore width obtained from the BJH method with the corrected Kelvin equation, i.e. KJS–BJH method at the maximum of pore size distribution calculated on the basis of adsorption data. [c]Pore wall thickness calculated as ($2d_{100}/\sqrt{3}$ - d_P), where the first term is the unit cell parameter.

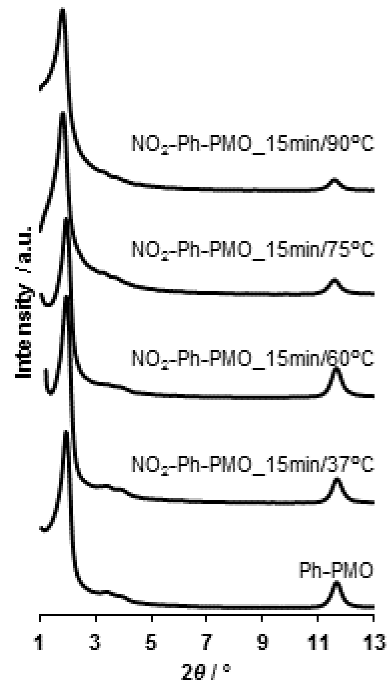
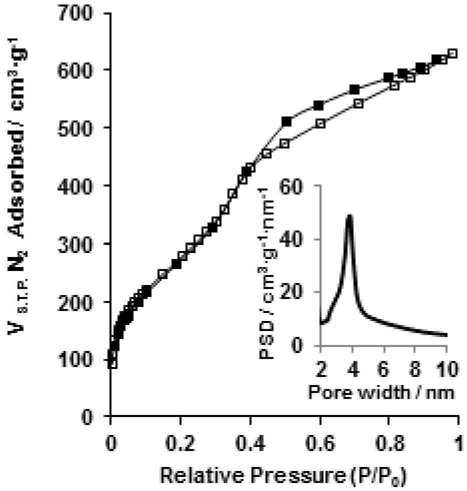


Figure S4. X-ray diffraction patterns of Ph-PMO and NO_2-Ph-PMO_15min synthesized at different reaction temperatures during 15 minutes.

a)



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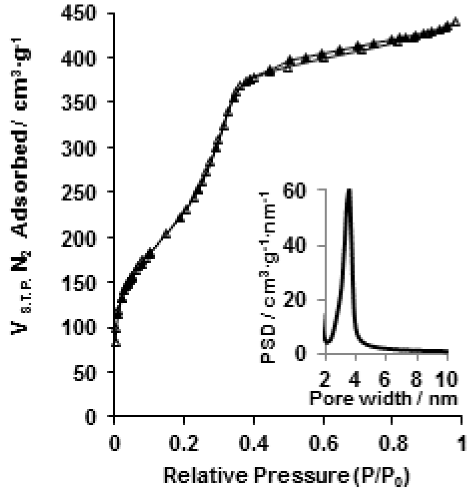

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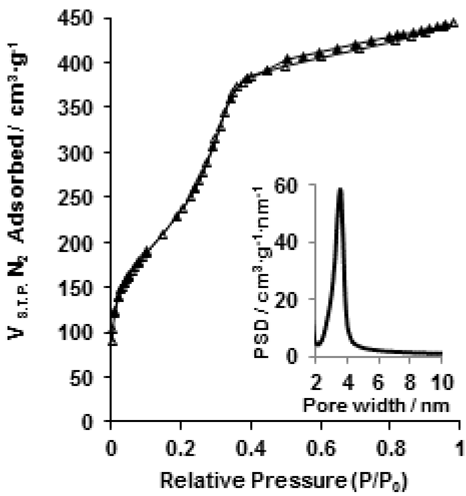

Figure S5. -196 ºC nitrogen type IV isotherms of: a) PMO; b) NO_2-PMO_15min/37ºC and c) NO_2-PMO_360min/60ºC. Empty/filled symbols correspond to adsorption/desorption. The insets display the characteristic narrow PSD curves of PMO materials.

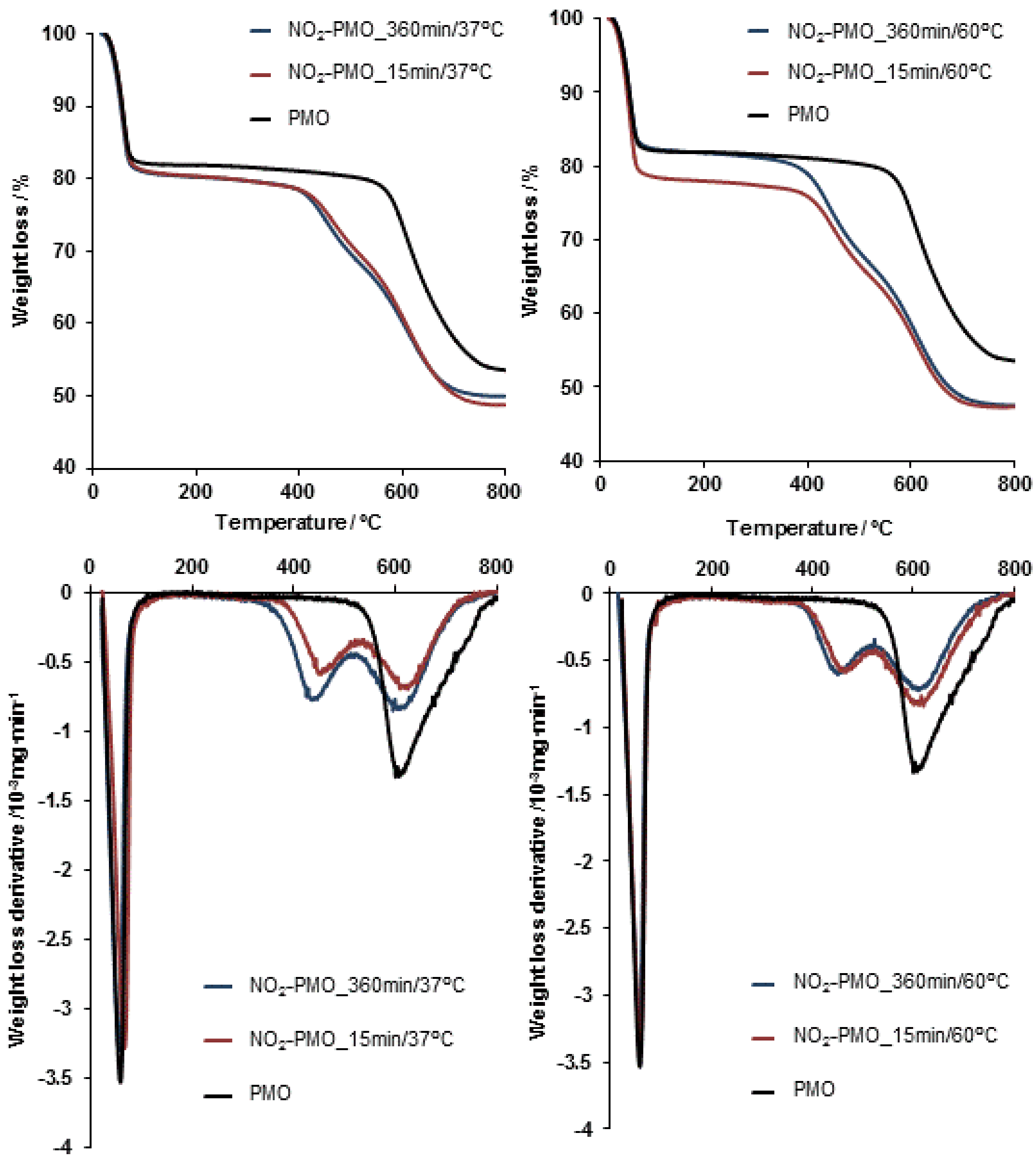

Figure S6. Weight loss curves (up) and weight loss derivatives (down) for PMO and NO_2-PMO.

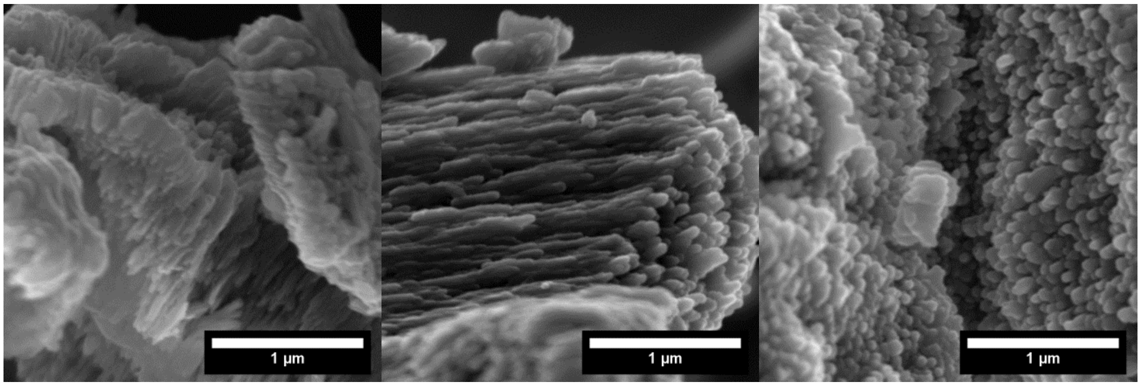

Figure S7. Scanning electron microscopy images for NO_2-PMO_C (left), NO_2-PMO_15min/37ºC (middle) and NO_2-PMO_360min/60ºC (right).

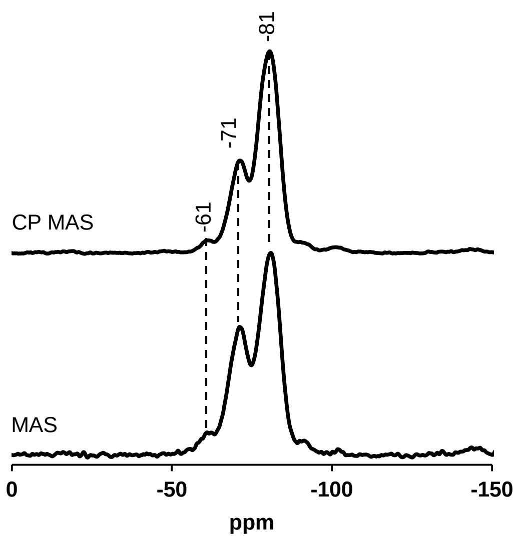

Figure S8. ^{29}Si MAS and CP MAS NMR spectra of the NH_2-PMO_15min/60ºC.

Table S2. Physical properties of PMO, NO_2-PMO_15min/60ºC and NH_2-PMO_15min/*y* materials.

Sample	d_{100} / nm	a / nm[a]	S_{BET} / m^2 g^{-1}	V_P / cm^3 g^{-1}	d_p / nm[b]	b / nm[c]
PMO	4.55	5.25	920	0.66	3.58	1.67
NO_2-PMO_15min/60ºC	4.70	5.42	698	0.57	3.54	1.88
NH_2-PMO_15min/37°C_C	4.46	5.15	752	0.44	3.27	1.88
NH_2-PMO_15min/37°C	4.37	5.05	722	0.44	3.40	1.65
NH_2-PMO_15min/60°C	4.41	5.10	699	0.44	3.40	1.70
NH_2-PMO_15min/75°C	4.37	5.05	688	0.43	3.40	1.65
NH_2-PMO_15min/90°C	4.46	5.15	686	0.44	3.54	1.61

[a]Unit cell parameter calculated as($2d_{100}/\sqrt{3}$) . [b]Pore width obtained from the BJH method with the corrected Kelvin equation, i.e. KJS–BJH method at the maximum of pore size distribution calculated on the basis of adsorption data. [c]Pore wall thickness calculated as ($2d_{100}/\sqrt{3} - d_P$), where the first term is the unit cell parameter.

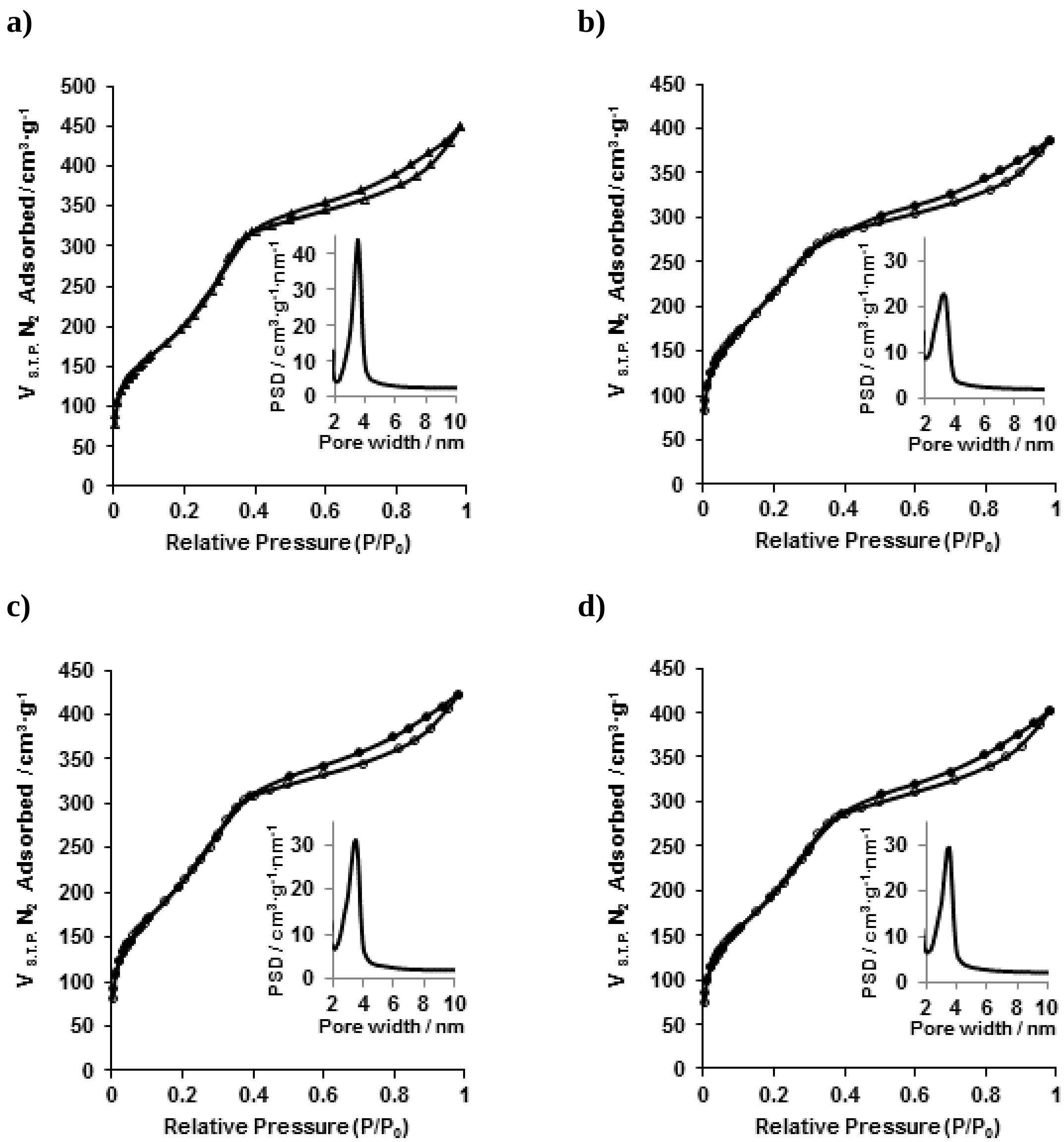

Figure S9. -196 ºC N_2 isotherms of a) NO_2-PMO_15min/60ºC (triangles); b) NH_2-PMO_15min/37ºC_C (circles); c) NH_2-PMO_15min/37ºC (circles) and d) NH_2-PMO_ 15min/90ºC (circles). Empty/full symbols correspond to adsorption/desorption. The insets display PSD curves.

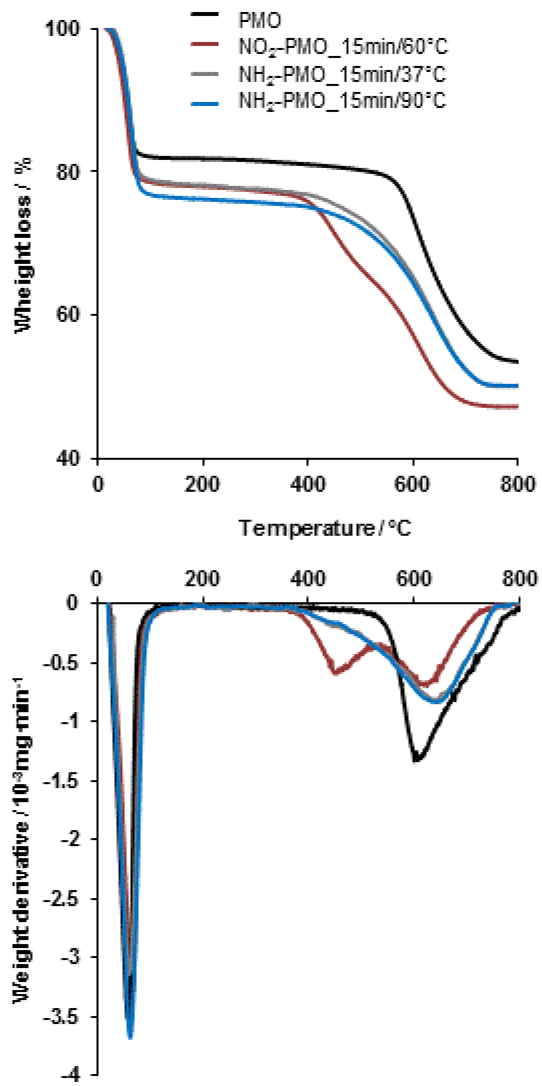

Figure S10. Weight loss curves (up) and weight loss derivatives (down) for PMO, NO_2-PMO_15min/60°C, NH_2-PMO_15min/37ºC and NH_2-PMO_15min/90ºC.