Supplementary Information 1

EXPERIMENTAL METHODS

The systems have been characterized by means of powder X-ray diffraction (X'Pert Philips, Cu K_ radiation), nitrogen adsorption measurements at 77 K (Quantachrome Autosorb1), BET specific surface areas have been calculated in the relative pressure range 0.04–0.1 and pore size has been evaluated following NLDFT model for cylindrical pores [M. Thommes, R. Köhn and M. Fröba, *Appl. Surf. Science*, 2002, **196**, 239].

For IR characterization (Bruker Equinox 55 spectrometer, resolution 2 cm^{-1}) powders were pressed into thin self-supporting wafers, then placed into a quartz cell and activated for 2 hours under dynamic vacuum (residual pressure < 10^{-3} mbar)

Thermogravimetric (TG) analyses were carried out on a Mettler Toledo thermogravimetric analyzer with a heating speed of 10 K/min under air in a flow of 50 mL/min.

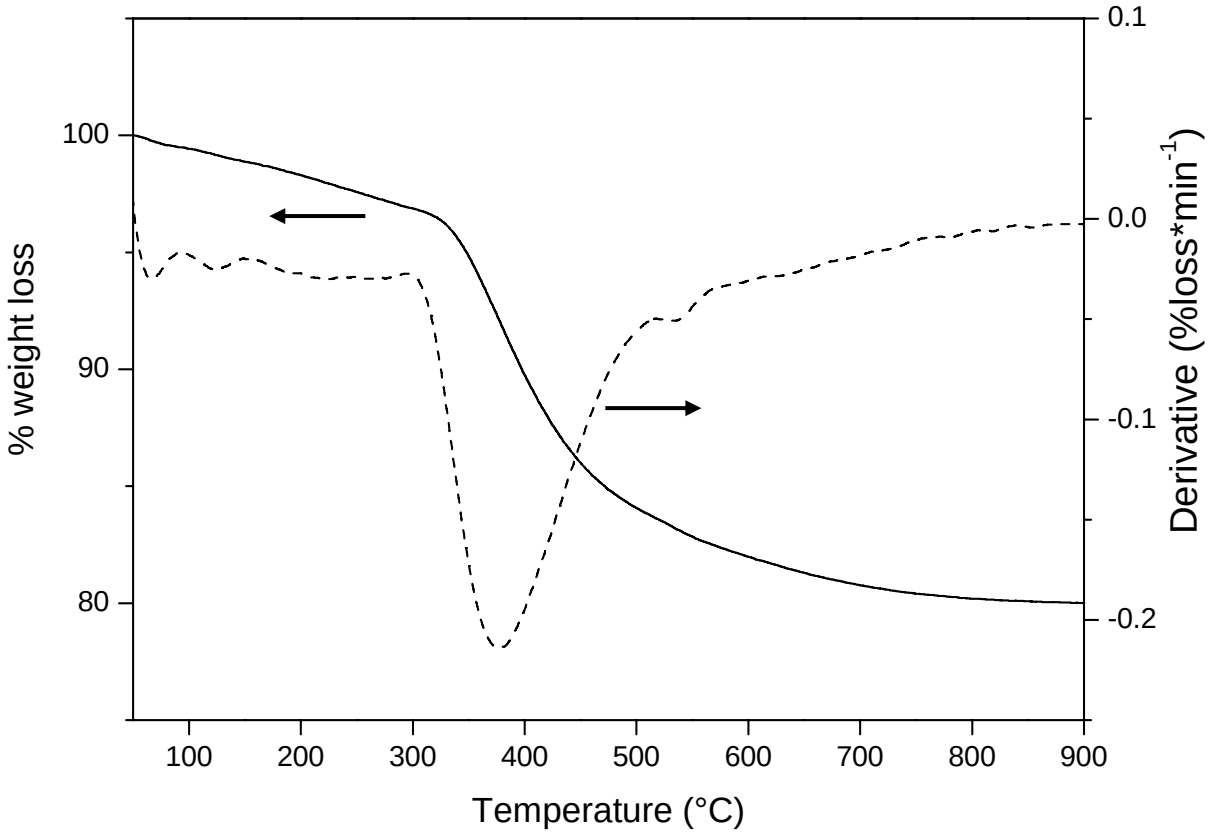
The solid-state NMR spectra were obtained with a Bruker Advance II spectrometer, equipped with a magic-angle spin probe using a 4-mm ZrO_2 rotor.

^{13}C (100.3 MHz) cross-polarization magic-angle spinning (CP-MAS) spectra were measured under experimental conditions of 3.5-ms contact time, 5-s recycle delay, and 12.0 kHz spin rate, and the ^{29}Si (79.51 MHz) CP-MAS NMR spectra were obtained at 291.3 K with 5-ms contact time, 5-s recycle delay, and 10 kHz spin rate

Transmission electron microscope (TEM) images were collected on a JEOL JEM 3010-UHR operating at 300 kV. Samples were dispersed on a lacey carbon Cu grid.

Supplementary Information 2

TG (solid line) and DTG (dash line) of Et_PMO_COOH.



Supplementary Information 3

Acid-base titration (NaOH) of COOH-functionalized ethane-bridge PMO (Et_PMO_COOH, curve a) and of unfunctionalized ethane-bridged PMO (curve b) in the presence of NaCl 1M