Synthesis of Periodic Mesoporous Organosilicas with Incorporated Aluminium

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Electronic Supplementary Information

**Figure S1.** Powder X-ray diffraction patterns of as-synthesised Al-CH$_2$-CH$_2$-PMO with different Si/Al ratios.

**Figure S2.** $^{27}$Al MAS NMR spectra of Al-CH$_2$-CH$_2$-PMOs (as-synthesised) with different Si/Al ratios.

**Figure S3.** $^1$H-$^{29}$Si MAS NMR spectra of as-synthesised Al-CH$_2$-CH$_2$-PMOs with different Si/Al ratios.

Identification of acidic sites by FTIR spectroscopy of adsorbed pyridine.
Figure S1. Powder X-ray diffraction patterns of as-synthesised Al-CH$_2$-CH$_2$-PMO with different Si/Al ratios.
Figure S2. $^{27}\text{Al}$ MAS NMR spectra of Al-CH$_2$-CH$_2$-PMOs (as-synthesised) with different Si/Al ratios.
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Identification of acidic sites by FTIR spectroscopy of adsorbed pyridine

The adsorption of pyridine was carried on the Al-CH$_2$-CH$_2$-PMO with different contents of Al. The solids were thermally treated at 150°C for 24 hours before the adsorption of pyridine. The solids were pressed with KBr into the pellets (KBr was calcined at 550°C for 24 hours before use). The spectra were recorded on a PerkinElmer FTIR spectrometer.

The spectra of pyridine adsorbed on a Al-CH$_2$-CH$_2$-PMOs show the presence of several bands. The lines at 1540 (m.) and 1640 (m.) cm$^{-1}$ registered for the samples with different Al-contents are indicative of pyridine bound to Bronsted acidic sites, while the line at \( \text{ca. 1490 (s.) cm}^{-1} \) can be ascribed to the pyridine bound to both Bronsted and Lewis acidic sites. The intense peak at 1444 (s.) cm$^{-1}$ is attributable to the H-bonded pyridine typical of the silica based molecular sieves.