Supplementary Information

Catalytic properties and deactivation behavior of H-MCM-22 in the conversion of methanol to hydrocarbons

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Fig. S2 Deconvolved $^{27}$Al MAS NMR spectra of H-MCM-22-15 and H-MCM-22-50 (the dash line is the simulated spectra).
Fig. S3 Product selectivity obtained over the parent and the oxalic acid-treated H-MCM-22 samples (Reaction conditions: 450 °C, WHSV of 2 h⁻¹); (A) H-MCM-22-15; (B) H-MCM-22-15-o; (C) H-MCM-22-25; (D) H-MCM-22-25-o; (E) H-MCM-22-37; (F) H-MCM-22-37-o; (G) H-MCM-22-50; (■) ethane and propane, (●) butane, (▲) C6+ (aliphatic and aromatics hydrocarbons).
Fig. S4 DTA profiles of the coked (a) H-MCM-22-15, (b) H-MCM-25-22, (c) H-MCM-22-37 and (d) H-MCM-22-50.
**Fig. S5** $p$-Xylene adsorption isotherms at 25 °C on the fresh and coked H-MCM-22-x and H-MCM-22-x-o.
**Fig. S6** GC-MS chromatogram of the coke species extracted with CH$_2$Cl$_2$ from (A) H-MCM-22-15, (B) H-MCM-22-25, (C) H-MCM-22-25-o and (D) H-MCM-22-37 at different reaction time (Reaction conditions: 450°C, WHSV = 2 h$^{-1}$. The asterisk (*) represents the internal standard (C$_2$Cl$_4$)).
Fig. S7 Raman spectra of the coke species deposited on the (a) H-MCM-22-25 and (b) H-MCM-22-37.
Scheme S1 MCM-22 framework with 8 crystallographically inequivalent T sites.