Support information

Effect of grafting agent on the structure and catalytic performance of Ti-MCM-22

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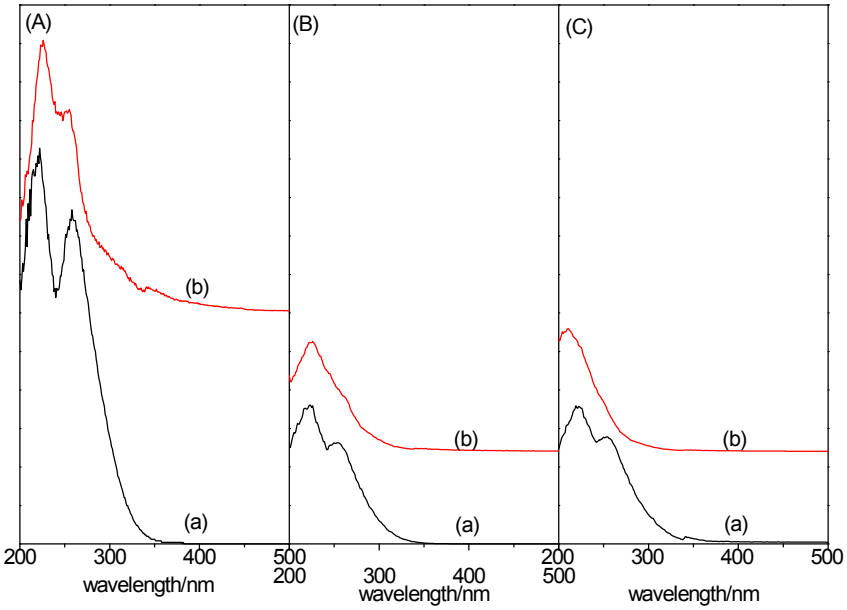

Fig. S1 DR UV-Vis spectra of (A) $Ti(O\text{-}Et)_4$, (B) $Ti(O\text{-}iPr)_4$ and (C) $Ti(O\text{-}Bu)_4$ grafted on Ti-MCM-22-deAl prepared with similar Si/Ti ratio: (a) original catalyst (b) 2 M HNO_3 acid-treatment for 20 h

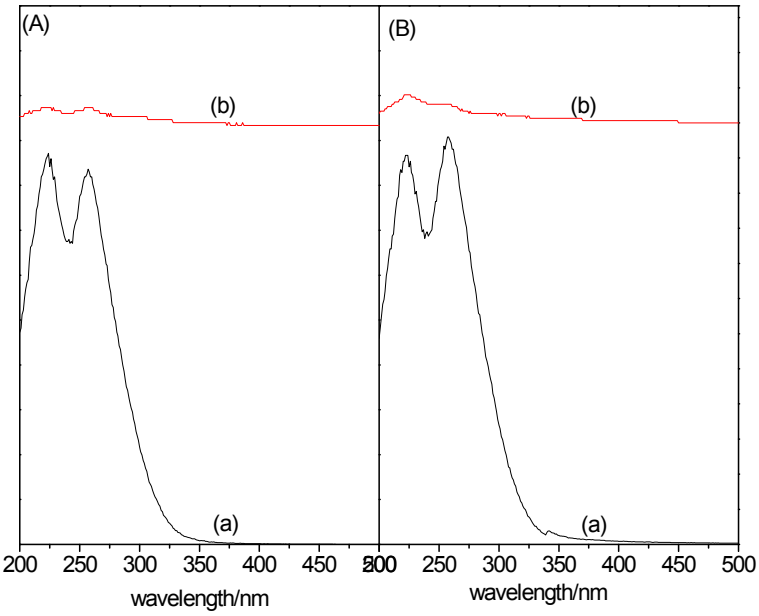

Fig. S2 UV-DRS spectra of (A) 50Ti(E)-MCM-22-EtOH and (B) 50Ti(B)-MCM-22-EtOH samples (a) before and (b) after 2 M HNO_3 acid-treatment for 20 h

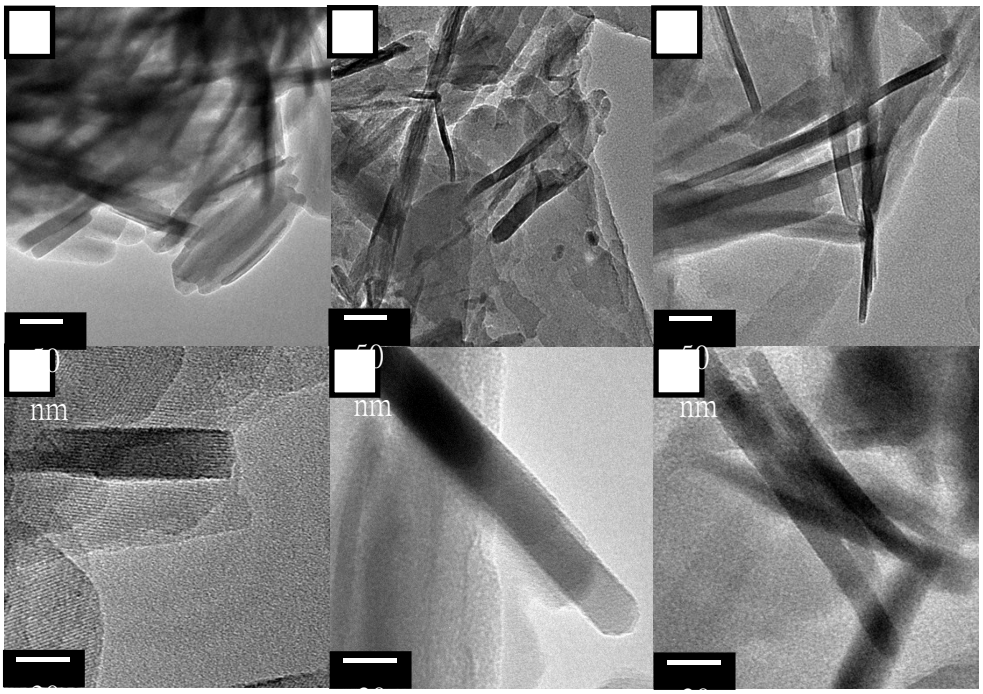

Fig. S3 Transmission electron micrographs of MCM-22 zeolites with Si/Ti ratio of (a) 15; (b), 50 and (c), 100.

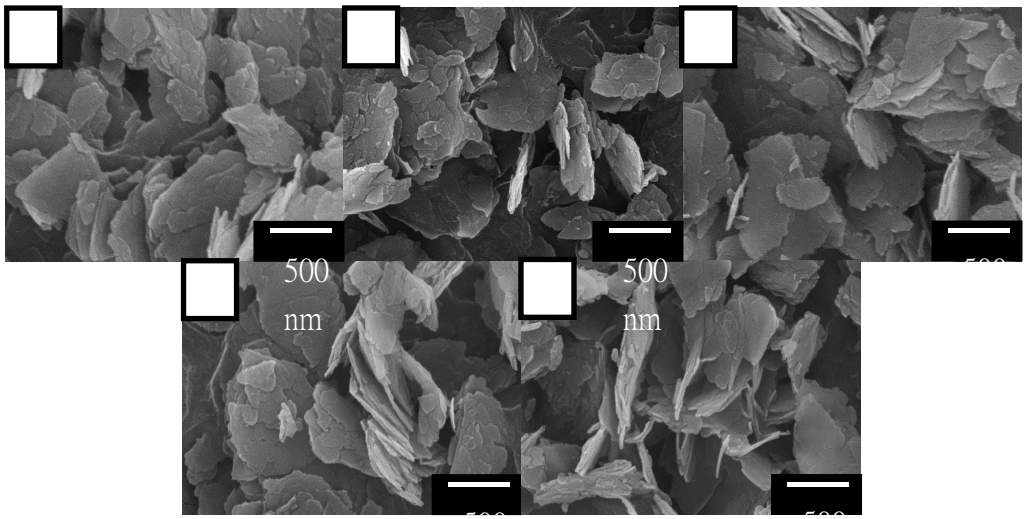

Fig. S4 The scanning electron micrographs of (a) MCM-22(P), (b) MCM-22-cal-deAl, (c) 15Ti(E)-MCM-22, (d) 50Ti(E)-MCM-22, and (e) 100Ti(E)-MCM-22.

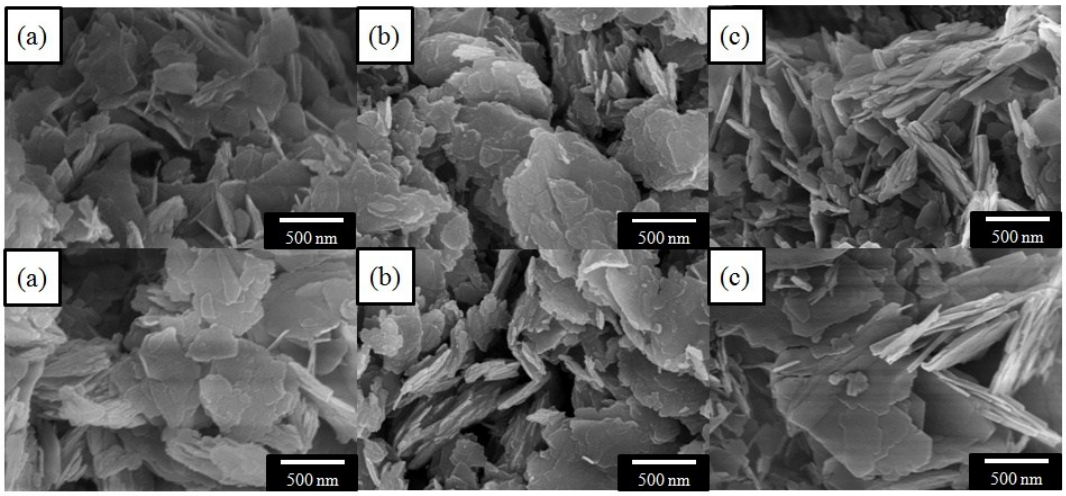

Fig. S5 The scanning electron micrographs of (a) 50Ti(P)-MCM-22 (b) 50Ti(B)-MCM-22 and (c) Ti-YNU-1 from Hitachi S-4800 Field Emission Scanning Electron Microscope.

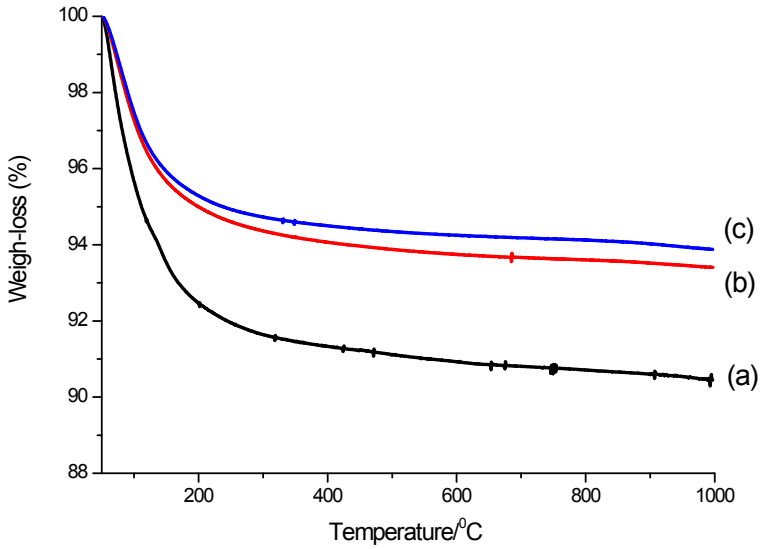

Fig. S6 Thermogravimetric analysis (TGA) curves in the range of 50–1000 °C of (a) MCM-22-cal-deAl, (b) 15Ti(E)-MCM-22 and (c) 50Ti(E)-MCM-22

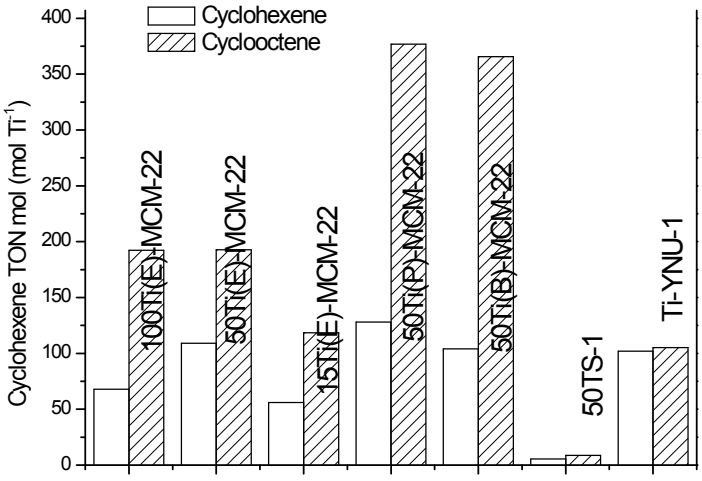

Fig. S7 Turnover number (TON) for the epoxidation of cyclohexene and cyclooctene over xTi(y)-MCM-22, Ti-YNU-1 and TS-1. Reaction conditions: 0.05 g of catalyst, 10 mmol of alkene, 5 mmol of TBHP (50 wt%), 3 mL of decane solvent, 353 K; TON was calculated using 30 min results.

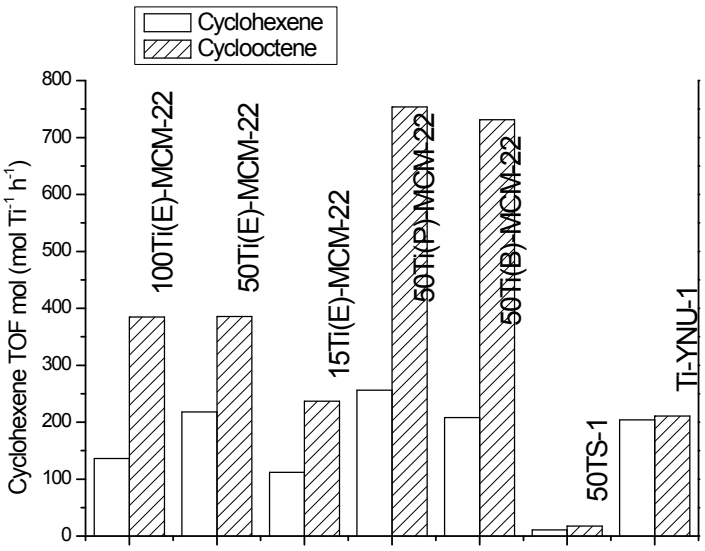

Fig. S8 Turnover frequency (TOF) for the epoxidation of cyclohexene and cyclooctene over xTi(y)-MCM-22, Ti-YNU-1 and TS-1. Reaction conditions: 0.05 g of catalyst, 10 mmol of alkene, 5 mmol of TBHP (50 wt%), 3 mL of decane solvent, 353 K; TOF was calculated using 30 min results.