

**Electronic Supplementary Information (ESI)**

**for**

**Enhancing ethylene epoxidation of MWW-type titanosilicate/H<sub>2</sub>O<sub>2</sub> catalytic  
system by fluorine implanting**

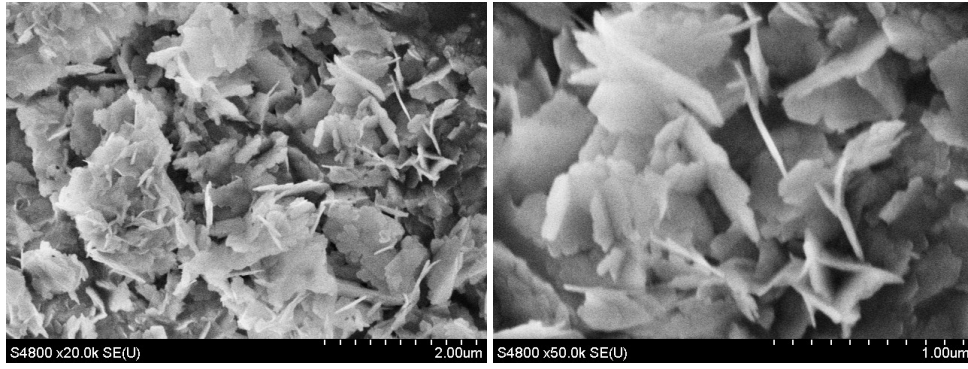
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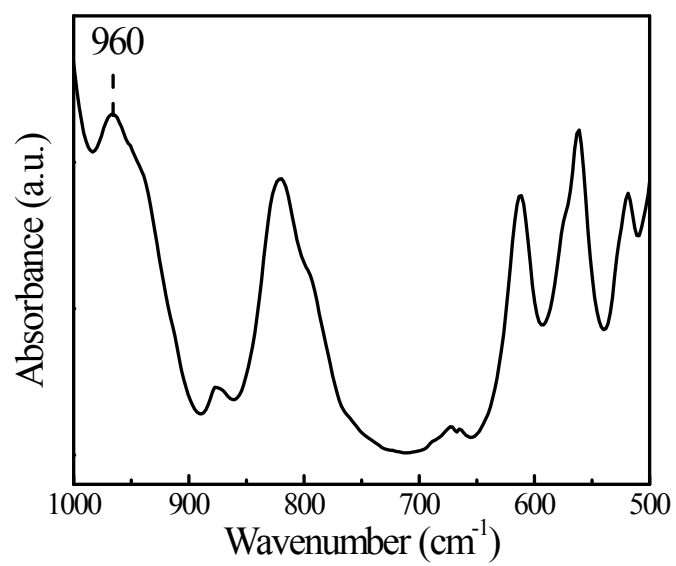
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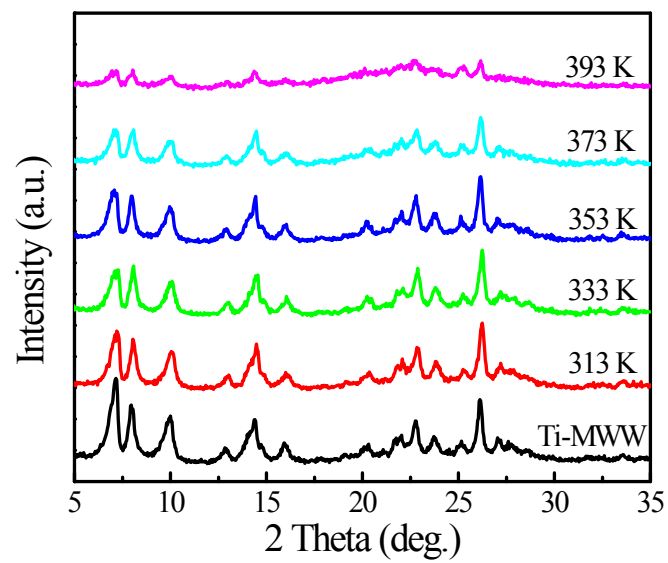
*Fax: +86-21 62232292*



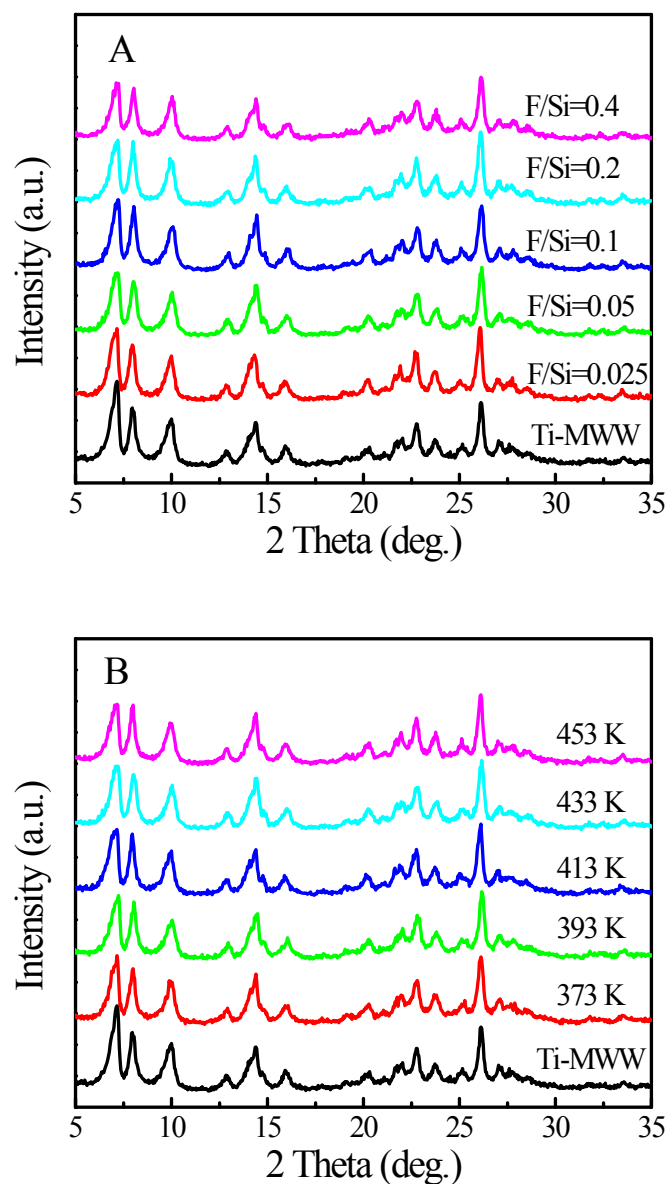
**Fig. S1.** SEM images of Ti-MWW.



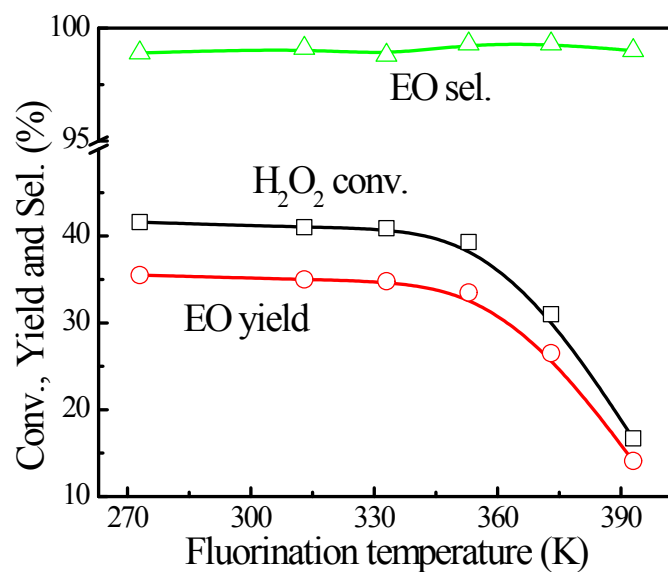
**Fig. S2.** FT-IR spectra of Ti-MWW.



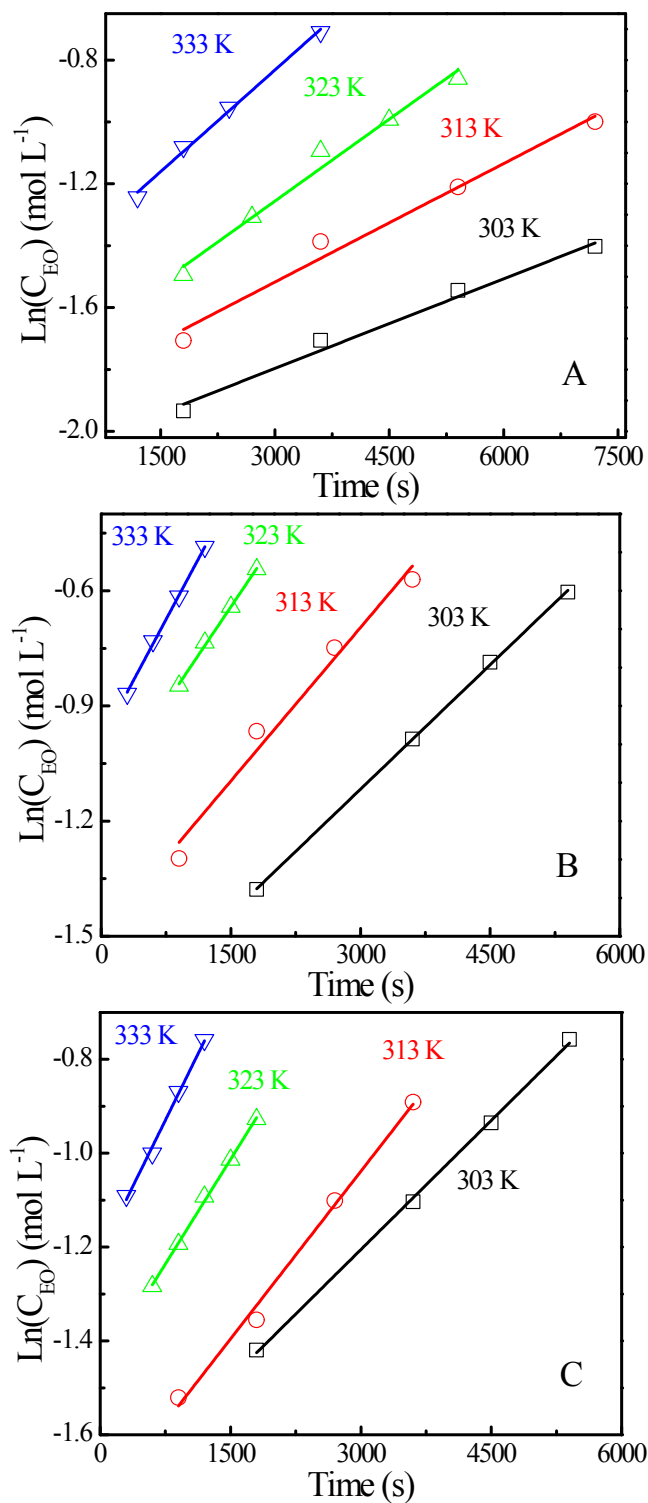
**Fig. S3.** XRD patterns of Ti-MWW and F-Ti-MWW-W samples post-synthesized at different temperatures for 4 h in  $\text{NH}_4\text{F}/\text{H}_2\text{O}$  system at a F/Si molar ratio of 0.05.



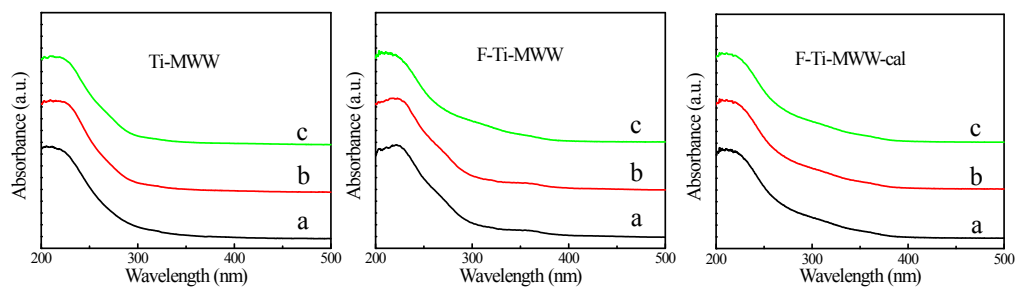
**Fig. S4.** XRD patterns of Ti-MWW and F-Ti-MWW-M samples post-synthesized with different  $\text{NH}_4\text{F}$  amount in  $\text{NH}_4\text{F}/\text{MeOH}$  system at 433 K for 4 h (A), and at different temperatures for 4 h in  $\text{NH}_4\text{F}/\text{MeOH}$  system at a F/Si molar ratio of 0.05 (B).



**Fig. S5.** The catalytic activity of ethylene epoxidation over F-Ti-MWW-W as a function of fluorination temperature in NH<sub>4</sub>F/H<sub>2</sub>O system at F/Si = 0.05. The symbol at 273 K stands for Ti-MWW. Reaction conditions: cat., 0.1 g; ethylene, 2.5 MPa; H<sub>2</sub>O<sub>2</sub>, 10 mmol; MeCN, 10 g; temp., 313 K; time, 2 h.

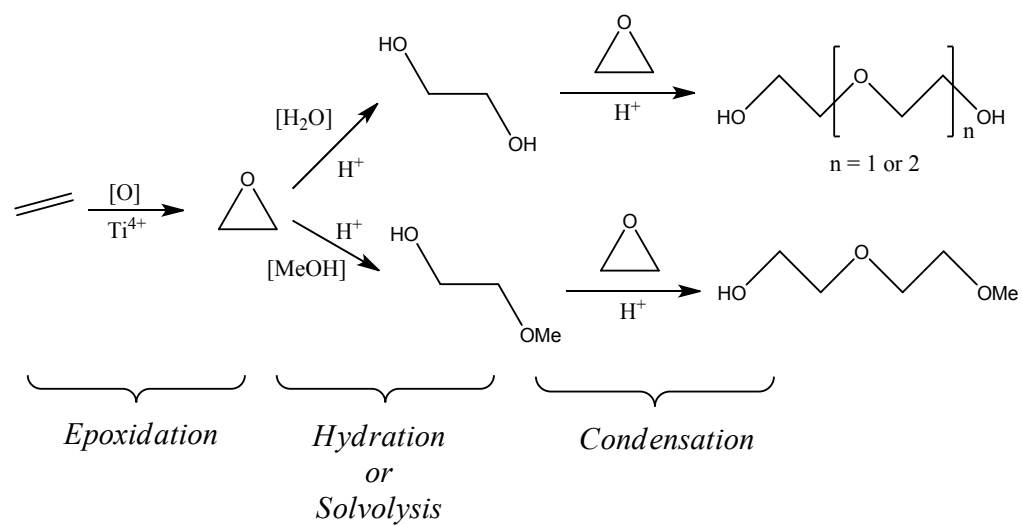


**Fig. S6.** Kinetics of ethylene epoxidation over Ti-MWW (A), F-Ti-MWW (B) and F-Ti-MWW-cal (C). Reaction conditions: cat., 0.1 g; ethylene, 2.5 MPa;  $\text{H}_2\text{O}_2$ , 10 mmol; MeCN, 10 g. F-Ti-MWW: Ti-MWW was treated in a solution of methanol and  $\text{NH}_4\text{F}$  at 433 K for 4 h at a F/Si molar ratio of 0.05. F-Ti-MWW-cal: F-Ti-MWW was further calcined at 823 K for 6 h.



**Fig. S7.** UV-vis spectra of the fresh catalysts (a), recovered ones and further calcined at 823 K for 6 h (c).





**Scheme S1** Reaction pathways of ethylene epoxidation.