Electronic Supplementary Material (ESI) for Catalysis Science & Technology.


# Dealumination-controlled strategy mediates Ti-Y zeolite with cooperative active sites for selective oxidations

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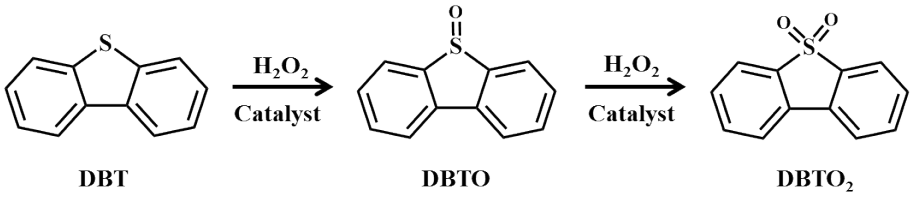


**Scheme S1.** Reaction pathways of DBT oxidation with $H_2O_2$.

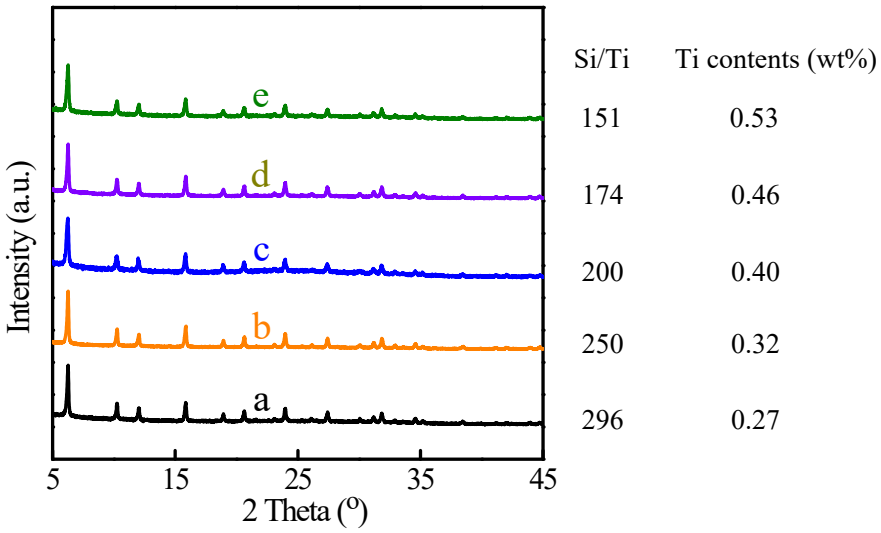


**Fig. S1** XRD patterns, Si/Ti molar ratio and Ti contents of Ti-Y-12-200 (a), Ti-Y-12-150 (b), Ti-Y-12-100 (c), Ti-Y-12-75 (d), and Ti-Y-12-50 (e) samples.

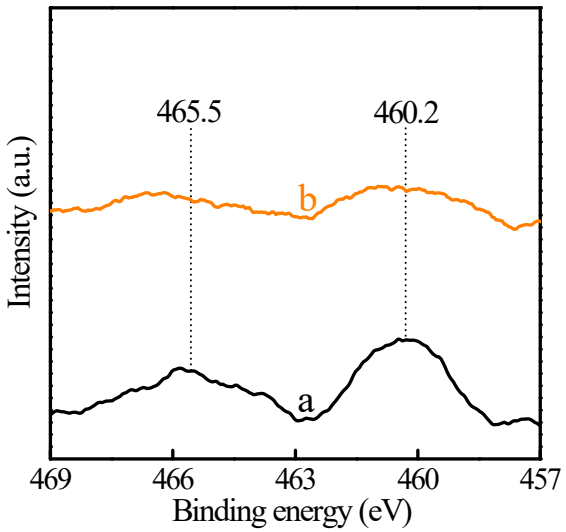


**Fig. S2** Ti 2p XPS spectra of Ti-Y-12-50 (a) and Ti-Y-12-200 (b) samples.

Two broad bands at about 460.2 and 465.5 eV, associated with $2p_{3/2}$ and $2p_{1/2}$ photoelectrons of isolated Ti ions in the zeolite framework,[1,2] were observed for Ti-Y-12-50 and Ti-Y-12-200 samples (Fig. S2).

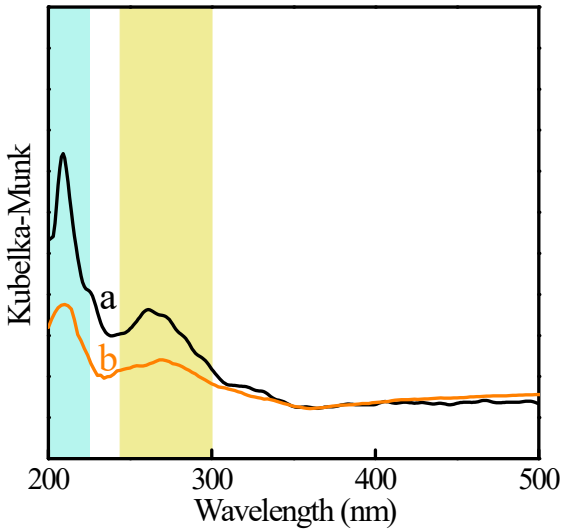


**Fig. S3** UV-Vis spectra of Ti-Y-12-50 (a) and Ti-Y-12-200 (b) samples.

As exhibited in Fig. S3, both Ti-Y-12-50 and Ti-Y-12-200 samples gave a sharp and intensive band at about 210 nm, attributed to tetrahedrally coordinated titanium,[3] in company with a broad shoulder signal in the region of 250–290 nm, associated with mononuclear octahedron titanium species.[3,4] Nearly no signals above 320 nm indicated the absence of titanium oxide like anatase.[4]

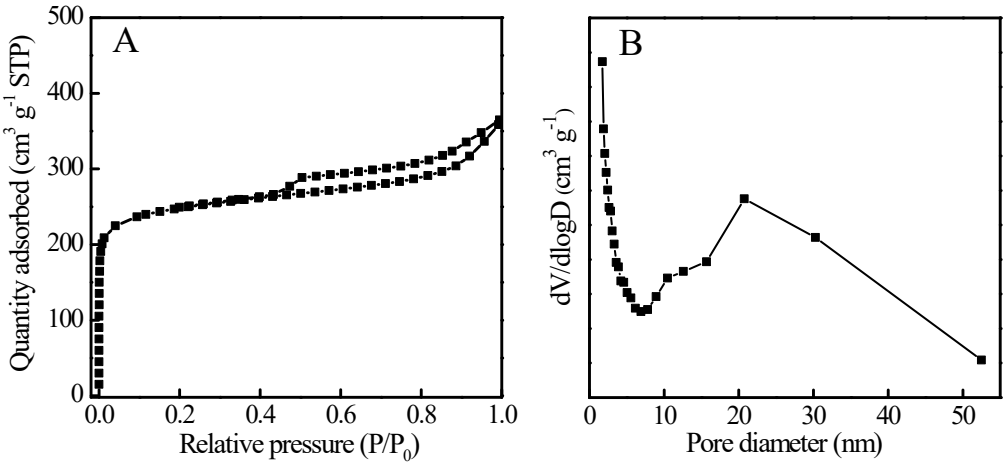


**Fig. S4** (A) $N_2$ adsorption-desorption isotherm and (B) pore size distribution of Ti-Y-12-50 sample.

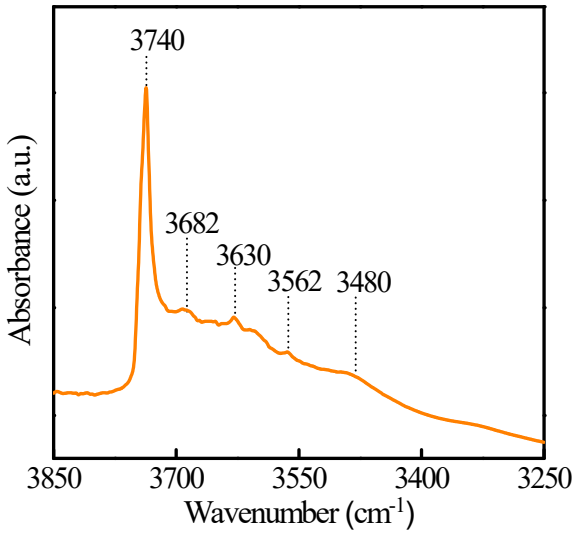


**Fig. S5** FT-IR spectra in the hydroxyl vibration region of Y-AT-12 sample.

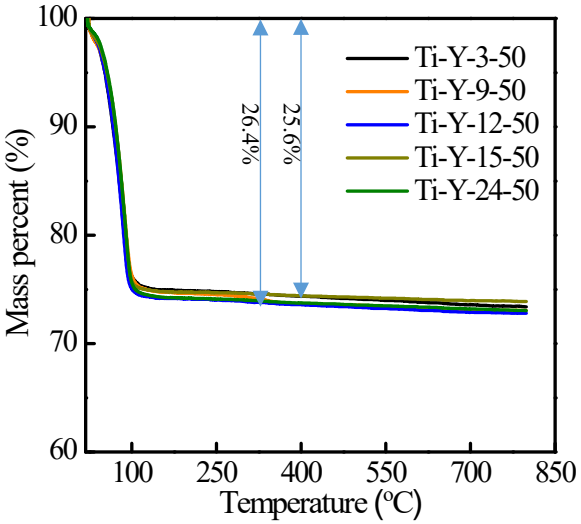


**Fig. S6** TG curves of various samples saturated with water for two days.

**References**

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