

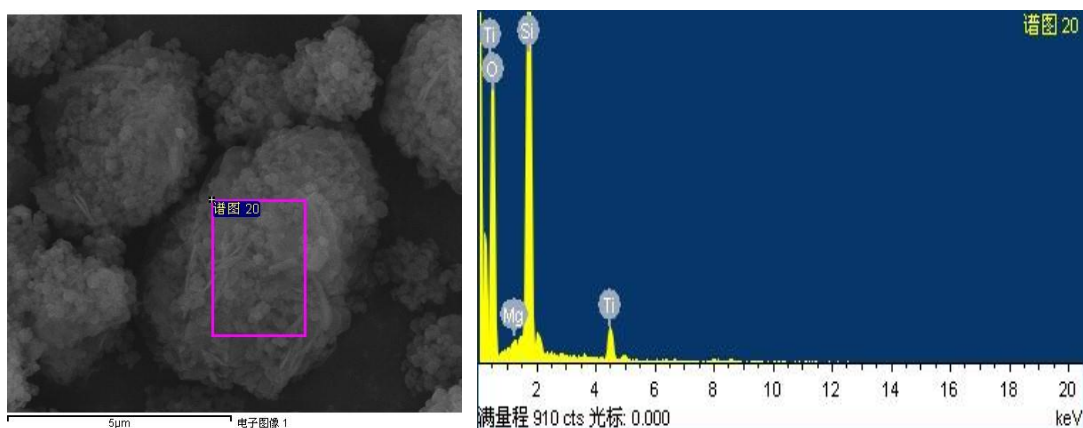
## Electronic Supplementary Information (ESI) for

### Improved Ti species distribution and hierarchical pores in TS-1: Towards regeneration of deactivated TS-1 caused by the corrosion of alkali

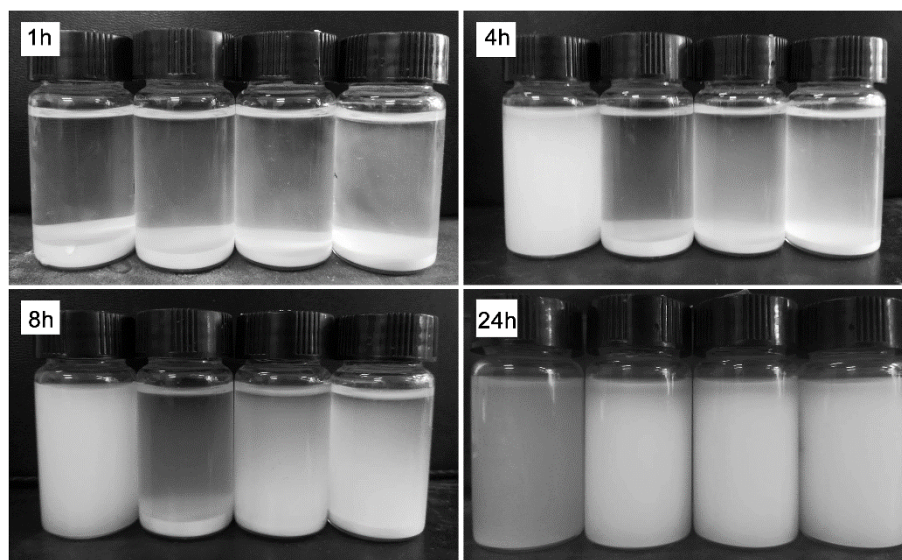
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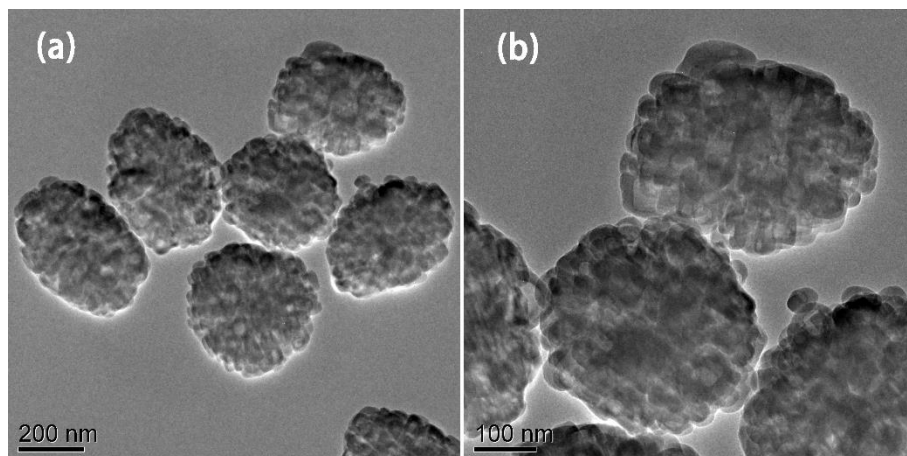
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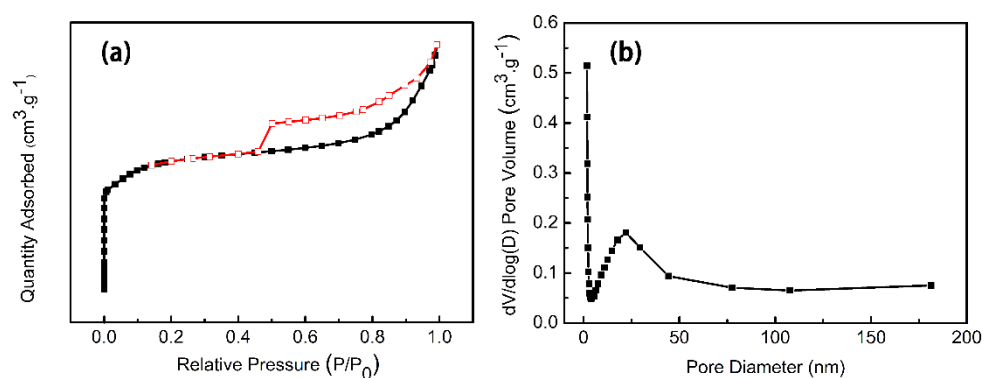
**Fig. S1.** EDS result of agglomerated particles doped with slice-shaped crystals in D-TS-1



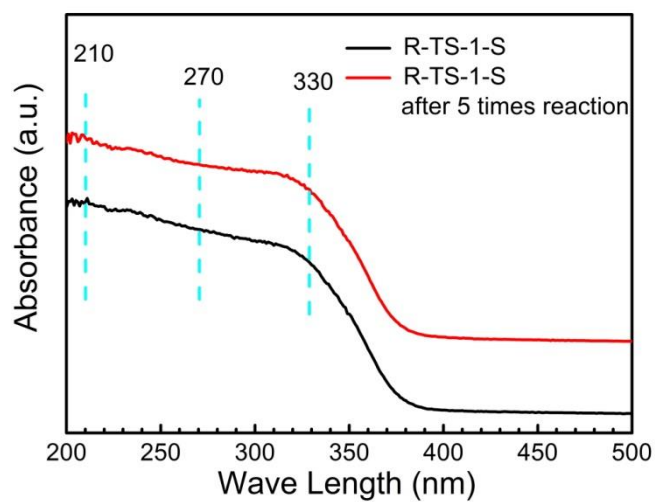
**Fig. S2.** Optical images of sedimentation experiment of F-TS-1, D-TS-1, R-TS-1-F and R-TS-1-S (from left to right) treated with NaOH (1 wt%) solution for different time.



**Fig. S3.** TEM images of hollow TS-1(H-TS-1) (a and b)



**Fig. S4.**  $\text{N}_2$  adsorption–desorption isotherms (a) and pore size distribution (b) of hollow TS-1(H-TS-1).



**Fig. S5.** Uv-vis spectra of R-TS-1-S in recycling test

**Table S1.** The catalytic performance for cyclohexanone ammoximation<sup>a</sup> over a mixture of F-TS-1 and amorphous TiO<sub>2</sub>

Samples <sup>b</sup>	Amount (mg)	X (%)	Y (%)	S (%)
F-TS-1	250	71.5	70.9	99.2
F-TS-1 + Amor	250+15	69.5	68.7	98.8
F-TS-1 + Amor	250+25	62.5	61.2	98.8
F-TS-1 + Amor	250+35	55.8	55.0	98.6
F-TS-1 + Amor	250+50	51.5	50.4	97.9

<sup>a</sup>Reaction conditions: t-BuOH (16.8 mL); NH<sub>3</sub> H<sub>2</sub>O (70 mmol) added in eight times; H<sub>2</sub>O<sub>2</sub> (70mmol) added dropwise within 70 min; cyclohexanone (60 mmol); temp., 353 K; reaction time (min), 75 min.

<sup>b</sup>F-TS-1 and a mixture of F-TS-1 and Amor. Amor represent amorphous TiO<sub>2</sub>.