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

Ultrafast Synthesis of Nanosized Ti-Beta *via* Structural Reconstruction Method as Efficient Oxidation Catalyst

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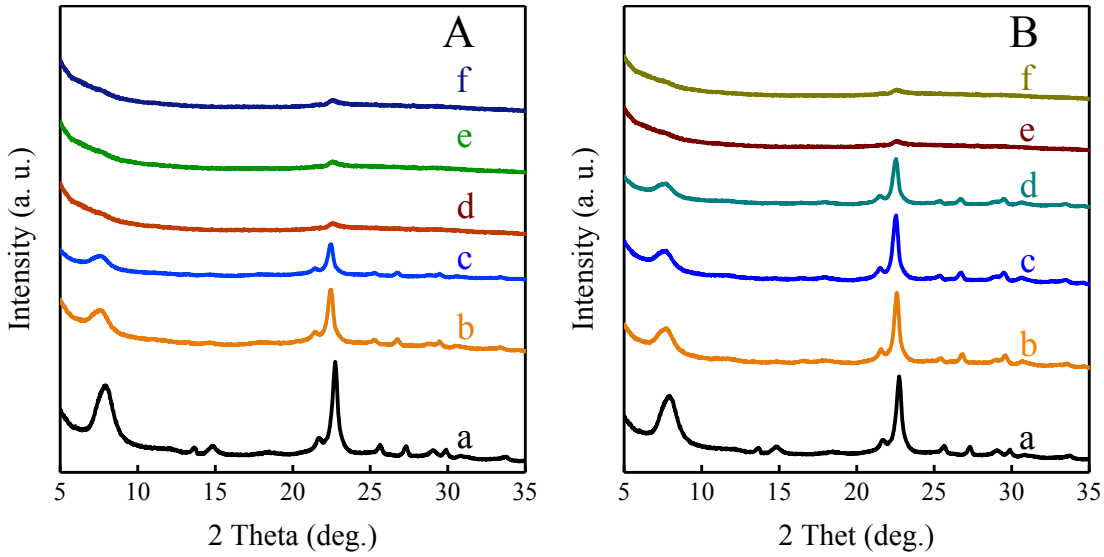

Fig. S1 (A) XRD patterns of Beta-DA (a), dissolved Beta-DA prepared at TEAOH/Si 0.1 (b), 0.2 (c), 0.3 (d), 0.4 (e) and 0.5 (f). Other dissolution conditions: Si/Ti = 50; H_2O/Si = 7.5; temp., 413 K; time, 1 h; (B) XRD patterns of Beta-DA (a), dissolved Beta-DA prepared with the H_2O/Si molar ratio of 1 (b), 2 (c), 3 (d), 4 (e) and 7.5 (f). Other dissolution conditions: Si/Ti = 50; TEAOH/Si = 0.3; temp., 413 K; time, 1 h.

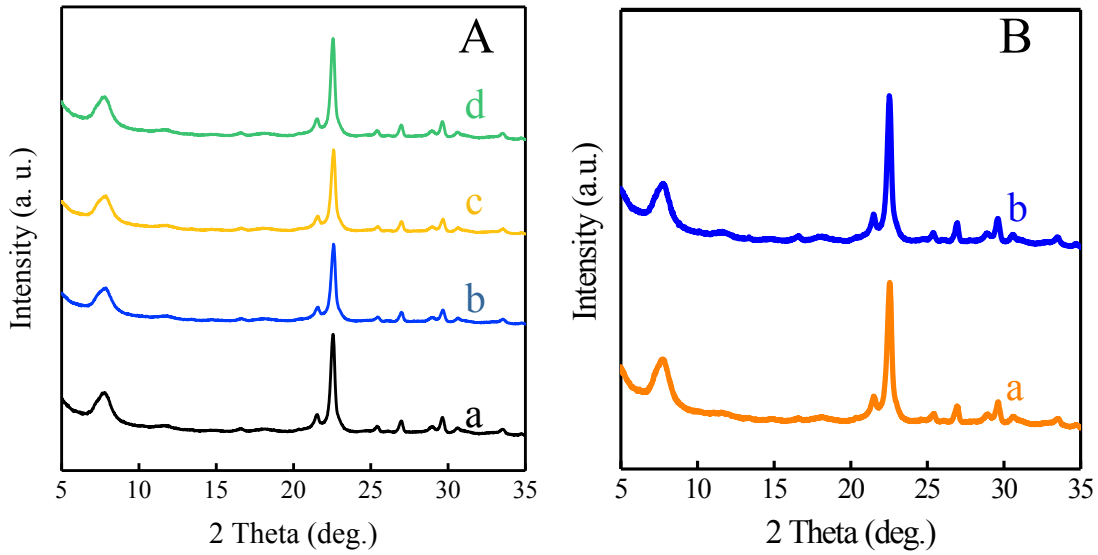

Fig. S2 (A) The XRD patterns of the products crystallized at TEAOH/SiO_2 ratio of 0.2 (a), 0.3 (b), 0.4 (c), 0.5 (d). Other crystallization conditions: Si/Ti = 50; NH_4F/Si = 0.5; H_2O/Si = 7.5; temp., 413 K; time, 24 h; (B) XRD patterns of the products crystallized at H_2O/Si ratio of 7.5 (a), 4 (b). Other crystallization conditions: Si/Ti = 50; NH_4F/Si = 0.5; TEAOH/Si = 0.3; temp., 413 K; time, 24 h.

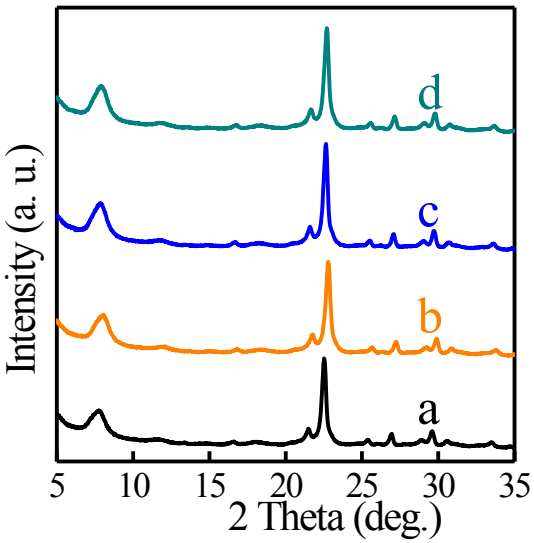

Fig. S3 XRD patterns of Ti-Beta-Re samples crystallized at 413 K (a), 433 K (b), 443 K (c) and 463 K (d). Other crystallization conditions: Si/Ti = 50; H_2O/Si = 7.5; TEAOH/Si = 0.3; time, 24 h.

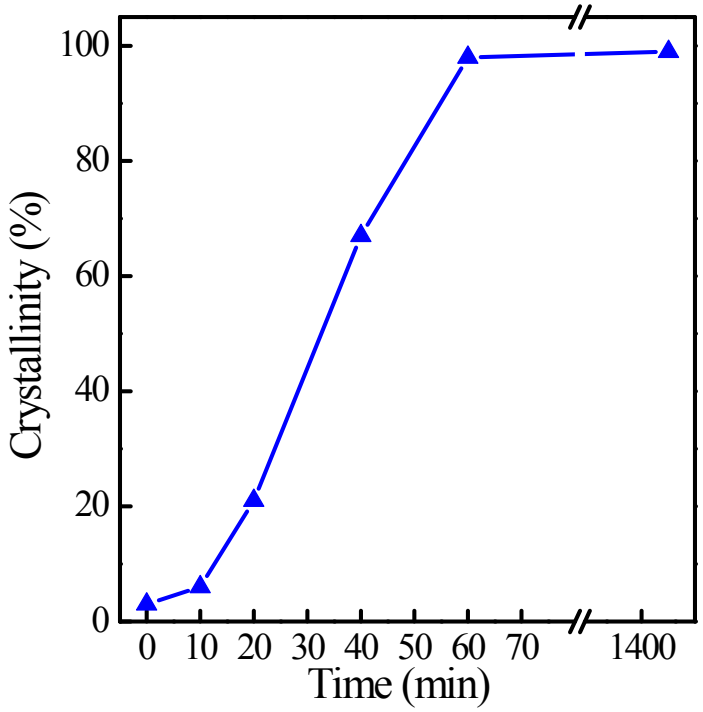

Fig. S4 Time-dependent crystallinity curve of Ti-Beta-Re-50 sample in the recrystallization process.

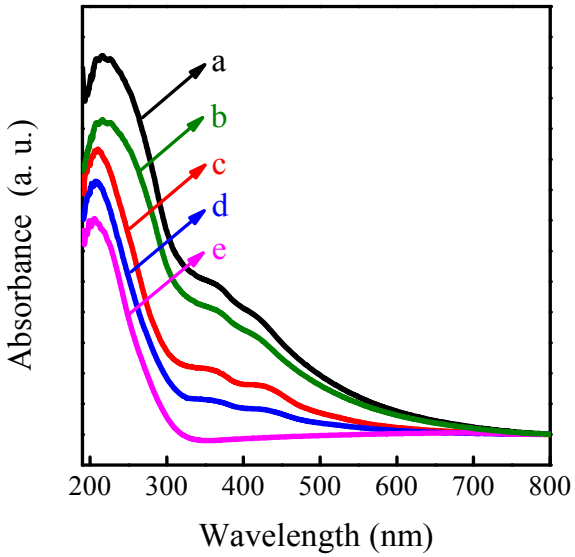

Fig. S5 UV-vis spectra of Ti-Beta-Re-50 obtained in recrystallization process for 0 min (a), 10 min (b), 20 min (c), 40 min (d), 60 min (e).

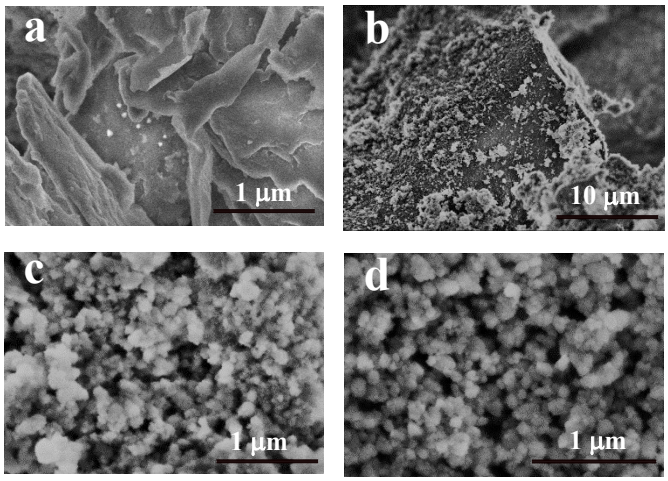

Fig. S6 SEM images of Ti-Beta-Re crystallized for 0 min (a), 20 min (b), 40 min (c) and 60 min (d).

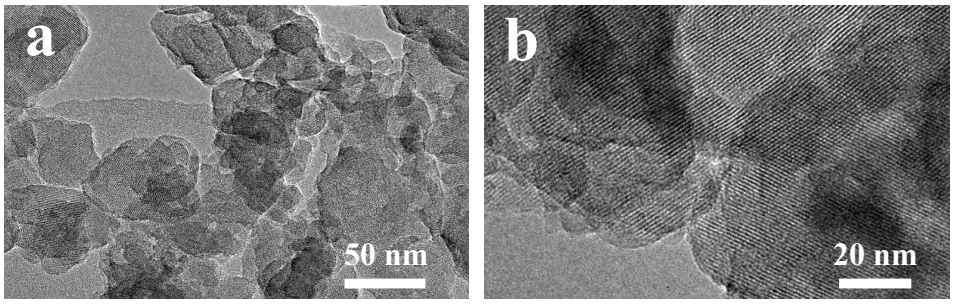

Fig. S7 TEM images of Ti-Beta-Re-50 sample.

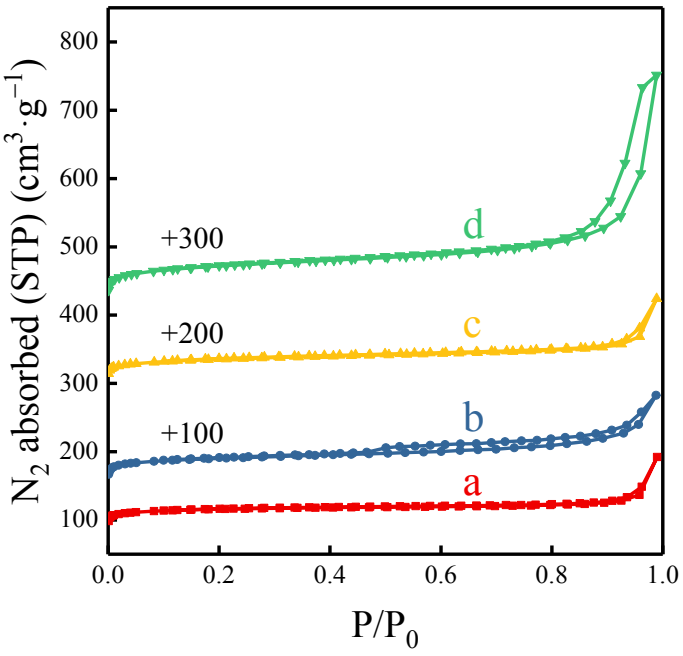

Fig. S8 N_2 adsorption-desorption isotherms of Ti-Beta-OH-50 (a), Ti-Beta-PS (b), Ti-Beta-F-50 (c), Ti-Beta-Re-50 (d).

Table S1 Decomposition and attribution of ^{29}Si MAS NMR spectra

Attribution	δ (ppm)	Area (%)			
		Ti-Beta-Re-50	Ti-Beta-F-50	Ti-Beta-OH-50	Ti-Beta-PS
Q^3	-103	2.87	4.48	8.71	12.3
Q^4	-108	7.23	15.78	16.01	5.33
	-113	62.62	59.53	58.23	60.11
	-116	27.32	20.2	17.05	22.26

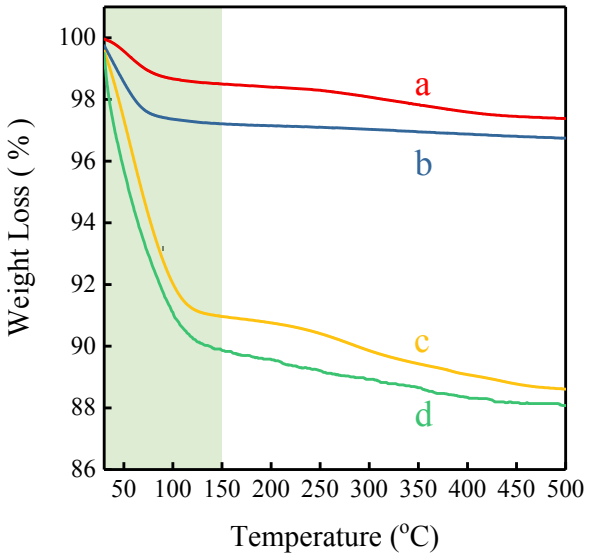

Fig. S9 Thermogravimetric curves for Ti-Beta-Re-50 (a), Ti-Beta-F-50 (b), Ti-Beta-OH-50 (c), and Ti-Beta-PS (d) after saturated with water vapor over aqueous NH_4Cl solution overnight in a desiccator.

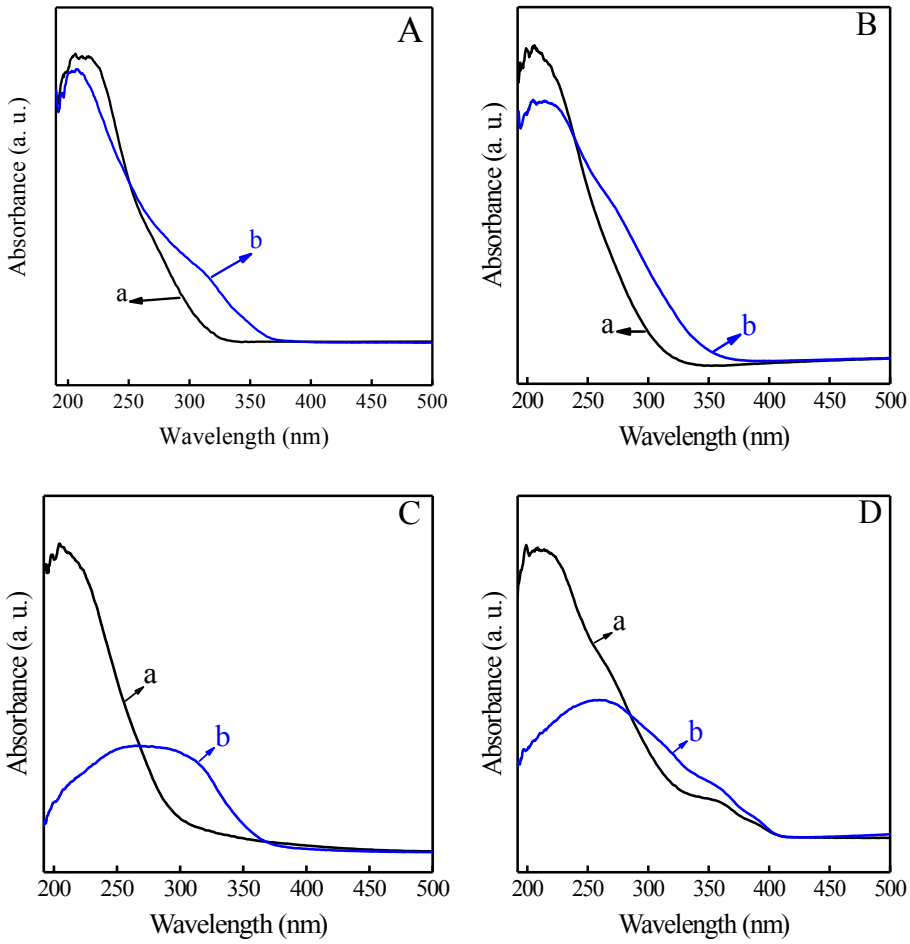

Fig. S10 UV-vis spectra of fresh parent (a), the used catalyst after calcination (b) of Ti-Beta-Re-50 (A), Ti-Beta-F-50 (B), Ti-Beta-OH-50 (C), Ti-Beta-PS (D).