Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Comparison of support synthesis method for TiO_2 and the effect of surface sulfates on its activity toward NH_3-SCR

Xuejun Zhang [a], Yun Xing [a], Zhongxian Song [b*], Heng Zhao [a], Min Zhao [a], Jinggang Zhao [a], Zi'ang Ma [a], Peipei Zhang [c], Noritatsu Tsubaki[c]

([a]College of Environmental and Safety Engineering, Shenyang University of Chemical Technology, Shenyang 110142, People's Republic of China; [b]Faculty of Environmental and Municipal Engineering, Henan Key Laboratory of Water Pollution Control and Rehabilitation Technology, Henan University of Urban Construction, Pingdingshan, 467036, People's Republic of China; [c]Department of Applied Chemistry, School of Engineering, University of Toyama, Gofuku 3190, Toyama 930-8555, Japan)

Corresponding Authors:

[*]Z. X. Song: email, songzhongxian@126.com, Tel., (+86)-375-2089031

1 XRD analysis

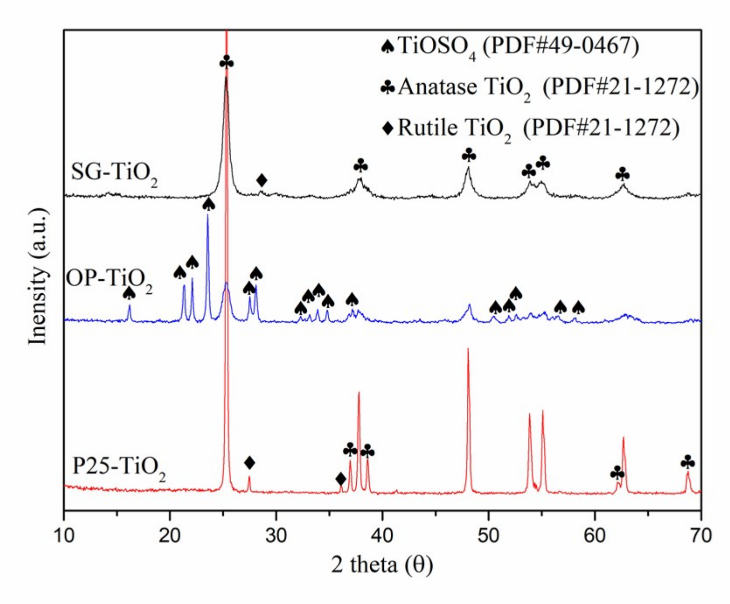

Fig. S1 XRD profiles of SG-TiO_2, P25-TiO_2 and OP-TiO_2 supports samples

The XRD profiles of SG-TiO_2, P25-TiO_2 and OP-TiO_2 supports were performed and the results were shown in Fig. S1. It was obviously that both rutile and anatase TiO_2 phase were dominant detected on P25-TiO_2 and SG-TiO_2, while the main phase of OP-TiO_2 was $TiOSO_4$ (PDF#49-0467). However, rutile TiO_2 was observed over IM-P25, which suggested that the sulphur treatment could contribute to the formation of anatase TiO_2.

2. Micro-structure analysis

Table S1 Specific surface area and total pore volume of the SG-TiO_2, P25-TiO_2 and OP-TiO_2 supports samples

Catalysts	BET surface area, m^2g^{-1}	Total Pore volume, cm^3g^{-1}	Average Pore diameter, nm
SG-TiO_2	84	0.240	9.1

P25-TiO_2	4	0.030	22.8
OP-TiO_2	58	0.201	10.9

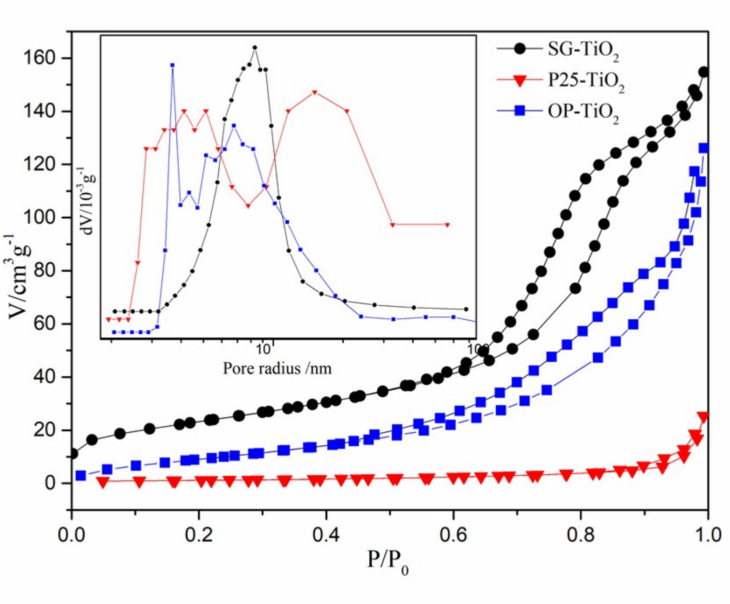

Fig. S2. N_2 adsorption/desorption isotherms and pore size distributions of the SG-TiO_2, P25-TiO_2 and OP-TiO_2 supports samples

Fig. S2 exhibited the N_2 adsorption-desorption isotherms of the different TiO_2 supports. Each of the samples displayed a distorted type-IV isotherm, which was typical for mesoporous materials (2-50 nm). Compared with the TiO_2 supports and synthesis of CeO_2-TiO_2-H_2SO_4 catalysts, the BET surface areas of IM-SG and IM-OP were decreased from 84 m^2/g to 49 m^2/g, 58 m^2/g to 24 m^2/g, respectively. The results confirmed that the preparation of impregnation-catalysts blocked the pores of the TiO_2 supports, which could decrease the BET surface areas of the catalysts. Furthermore, the BET surface area of IM-P25 was 8 m^2/g, which might be related to the generation of rutile TiO_2.