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Supporting Information

Influence of Sulfation and Regeneration on Pt/Al₂O₃ for NO Oxidation

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Fig.S1 NO conversion over 5hS sample system for 3 NO light off cycles and comparison of activated sample; and the concentration of NO, NO2 and NOx during 3 cycles of NO light off. The gas composition includes 500 ppm NO + 100 ppm CO +100 ppm $C_3H_6 + 10 \% O_2 + 5 \% CO_2 + 3 \% H_2O$ balanced N₂ and the space velocity was 30,000 h⁻¹.



Fig.S2 NO conversion over 20hS sample system for 3 NO light off cycles and comparison of activated sample; and the concentration of NO, NO2 and NOx during 3 cycles of NO light off. The gas composition includes 500 ppm NO + 100 ppm CO +100 ppm $C_3H_6 + 10 \% O_2 + 5 \% CO_2 + 3 \% H_2O$ balanced N₂ and the space velocity was 30,000 h⁻¹.



Fig. S3 NOx concentration during NO oxidation reaction (a) on 5 hours sample system, (b) on 20 hours system system.



Fig. S4. IR spectra of CO adsorption on all the different treatment catalysts (a) 5 hours catalysts system; (b) 20 hours catalysts system.



Fig.S5 TG result of fresh, active, sulfated and corresponding regenerated samples.

Confirming experiment:



Fig. S6 The steady-state of NO oxidation from 100 °C to 500 °C with the same gas composition of temperature programed NO oxidation.

In order to support my proposed mechanism (also reply the reviewer's concern), a verified steady-state experiment regarding NO oxidation of the 5 and 20 hrs sulfated catalysts with elevated temperatures was completed. The result is shown in Fig.6S. As seen in the figure, the NO conversion of the 5 and 20 hrs sulfated catalysts exhibits a similar trend with varying temperature from 100 to 500 °C, indicating that the NO oxidation ability is not predominately controlled by the storage of NOx.