Electronic Supplementary Material (ESI) for RSC Advances.

Nb-doped VO_x/CeO_2 catalyst for NH_3-SCR of NO_x at low temperatures

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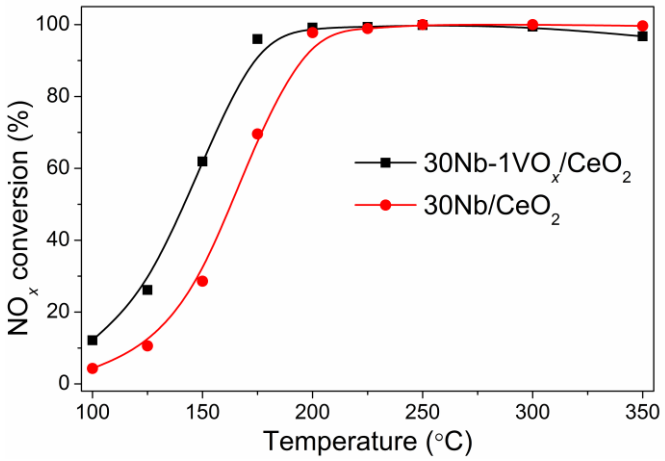

Fig. S1 NH_3-SCR activity over 30Nb-1VO_x/CeO_2 and 30Nb /CeO_2 catalysts. Reaction conditions: [NO] = [NH_3] = 500 ppm, [O_2] = 5 vol. %, N_2 balance, total flow rate 500 ml/min and GHSV = 50 000 h^{-1}.

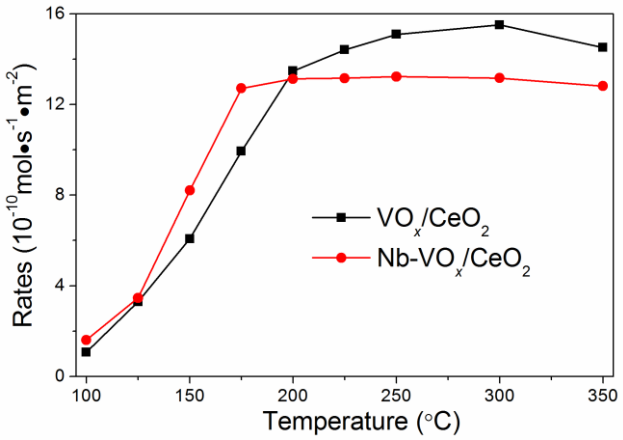

Fig. S2 The NH_3-SCR reaction rates normalized by surface area over VO_x/CeO_2 and 30Nb-VO_x/CeO_2 catalysts.

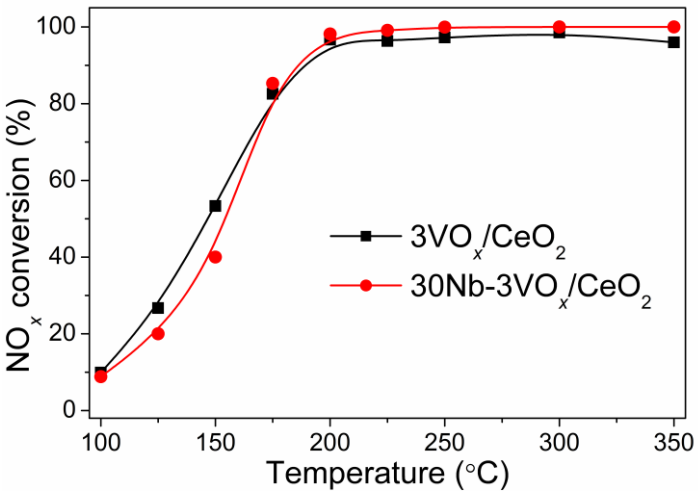

Fig. S3 NH_3-SCR activity over $3VO_x/CeO_2$ and $30Nb\text{-}3VO_x/CeO_2$ catalysts.

Reaction conditions: [NO] = [NH_3] = 500 ppm, [O_2] = 5 vol. %, N_2 balance, total flow rate 500 ml/min and GHSV = 50 000 h^{-1}.

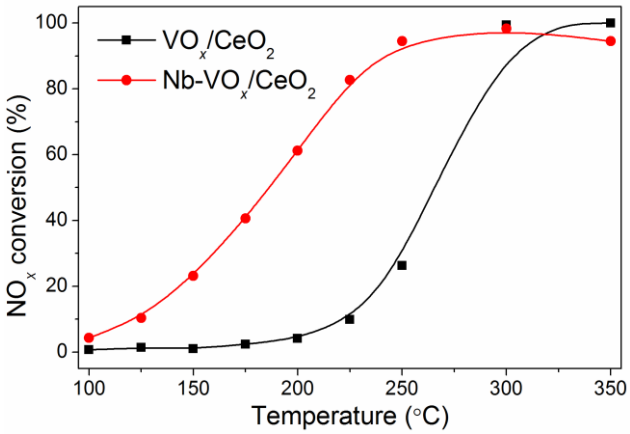

Fig. S4 NH_3-SCR activity over $1VO_x/CeO_2$ and $30Nb\text{-}1VO_x/CeO_2$ catalysts after 100 ppm SO_2 poisoning for 48 h.

Reaction conditions: [NO] = [NH_3] = 500 ppm, [O_2] = 5 vol. %, N_2 balance, total flow rate 500 ml/min and GHSV = 50 000 h^{-1}.

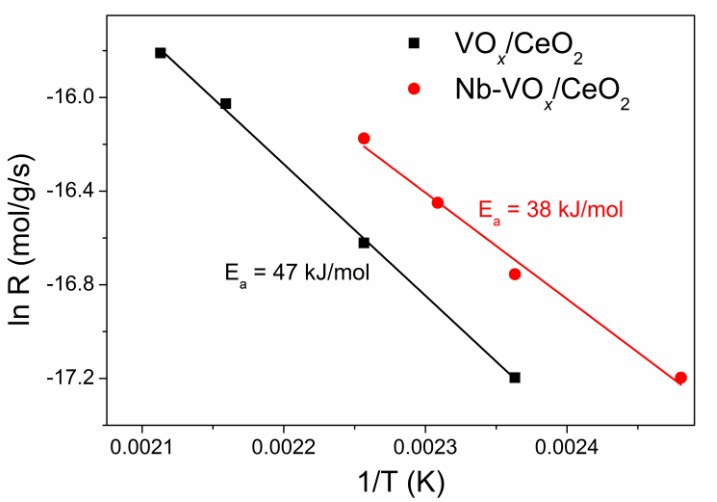

Fig. S5 Plots of rate (R) versus temperature of NO reduction over VO_x/CeO_2 and 30Nb-1VO_x/CeO_2 catalyst. Reaction conditions: total flow rate: 500 ml/min, mass of the catalyst: 100 mg (40-60 mesh), 500 ppm NO + 500 ppm NH_3 + 5% O_2.

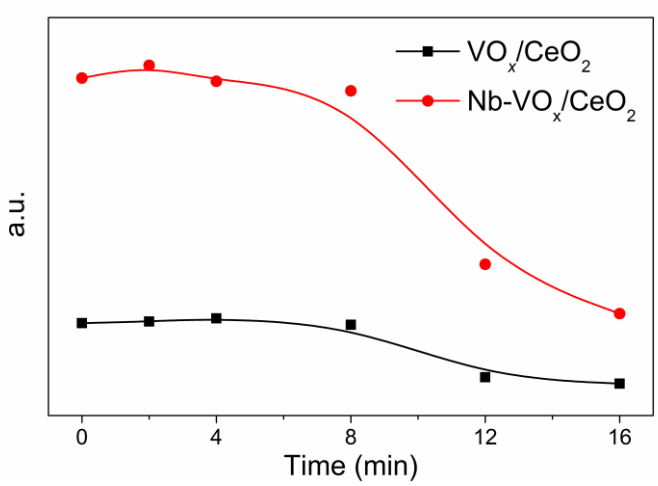

Fig. S6 The band intensities of adsorbed NH_3 species calculated from DRIFT spectra over 1VO_x/CeO_2 and 30Nb-1VO_x/CeO_2 pretreated by exposure to NH_3 followed by exposure to NO + O_2 at 175 ^oC.

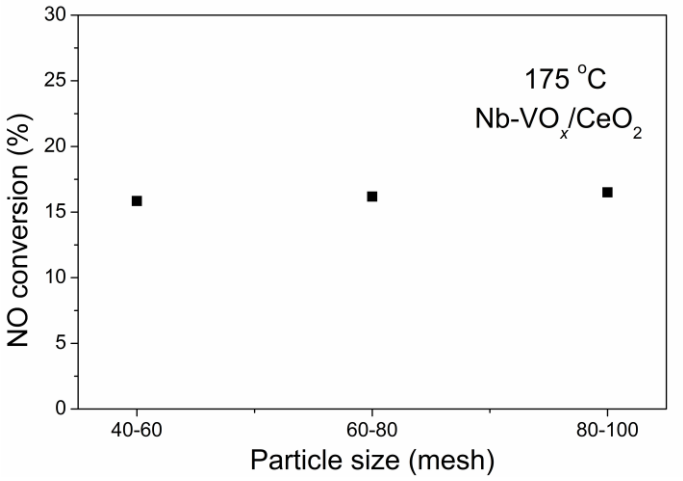

Fig. S7 Influence of particle-size-distribution on the NO conversion over 30Nb-1VO_x/CeO_2 catalyst. Reaction conditions: total flow rate: 500 ml/min, mass of the catalyst: 100 mg, temperature: 175 ^oC, 500 ppm NO + 500 ppm NH_3 + 5% O_2.

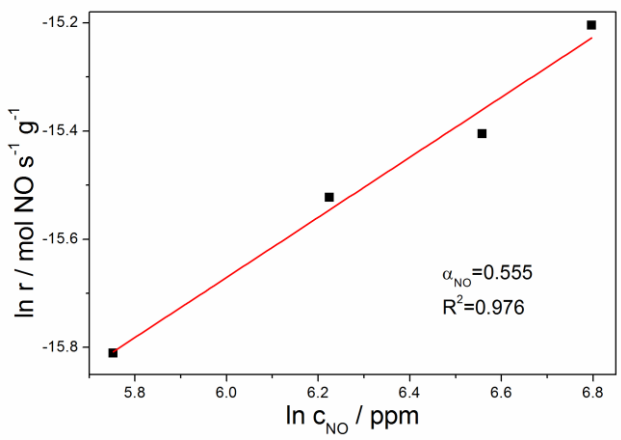

Fig. S8 Plot of lnr to lnc_{NO} over 30Nb-1VO_x/CeO_2 catalyst. Reaction conditions: total flow rate: 500 ml/min, mass of the catalyst: 100 mg (40-60 mesh), temperature: 175 ^oC, 200-900 ppm NO + 500 ppm NH_3 + 5% O_2.