

Selective oxidation of NH_3 and CO emission with superior N_2 selectivity by adding low Pt content over Vanadium-based SCR catalyst

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The emission of CO and NH_3 from industry and power plant exhausts is a major concern in the air pollution control. One practical aftertreatment approach is a direct use of the modified NH_3 -SCR catalyst in rear part as a selective oxidation of CO and slipped NH_3 . We report a strategy of vanadium-based SCR catalyst by adding 0.3 wt.% Pt loading (PtVW/TiO₂) for the oxidation of CO along with selective catalytic oxidation of NH_3 . The PtVW/TiO₂ catalyst showed a high N_2 selectivity (>90%) at the valid temperature range (350–400 °C), which was clearly distinct from the Pt-only catalyst. We examined the strong interaction between Pt and V over bimetallic Pt–V sites, resulting in the improved N_2 selectivity. The increase of reducibility and surface acidity attributed to the enhancement of N_2 selectivity. The reaction network was also identified with observations by DRIFTS, suggesting the pathway of N_2 formation could be triggered by internal-SCR and CO-SCR surface reactions.