

Influence of Transition Metal Oxides and h-BN on the  $\text{NH}_3$ -SCR and CO Oxidation at low temperature

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Selective catalytic reduction of  $\text{NO}_x$  with  $\text{NH}_3$  ( $\text{NH}_3$ -SCR) requires a lot of research to solve problems such as poor catalytic efficiency at low temperature and the emission of unreacted ammonia ( $\text{NH}_3$ -Slip). Accordingly, this study deals with the abatement of  $\text{NO}_x$  for  $\text{NH}_3$ -SCR and oxidation performance using the mainly emitted gases ( $\text{NO}$ ,  $\text{CO}$ ,  $\text{NH}_3$ ) of stationary source. As transition metals, Such as Cu, Ce, Co are known for excellent redox properties and characteristics of various redox species. We synthesized the catalyst by impregnating a selected transition metal into hexagonal boron nitride (h-BN). Compared to V/Ti catalysts synthesized by conventional methods, the catalyst modified with porous h-BN has enhanced particle anti-aggregation and the highly dispersed catalytic active metal particles improve activity at low temperatures and SCR performance. In addition, this study suggests the possibility of simultaneous removal of  $\text{CO}$ ,  $\text{NH}_3$  through oxidation performance. The improved properties are mainly confirmed in X-ray photoelectron spectroscopy (XPS), temperature program desorption (TPD), temperature program reduction (TPR)