

Effect of promoter and impregnation method of V_2O_5/TiO_2 catalyst on selective catalytic reduction of NO_x with NH_3

_____, _____, _____*
(dohkim@snu.ac.kr*)

Recently, N_2O , whose greenhouse effect is 310 times larger than CO_2 , has been issued due to the new regulatory trend. The formation of N_2O has been observed in the selective catalytic reduction (SCR) system as a function of side reaction, especially at higher temperature than $300^\circ C$. In this study, we aimed at finding the proper promoter of V_2O_5/TiO_2 catalyst with excellent deNO_x activity and minimized N_2O formation by changing the various parameters such as promoters and the order of impregnation. 5 wt% V_2O_5/TiO_2 catalyst was prepared by applying wet impregnation method using vanadium precursor with V^{3+} state. Although W promoted V_2O_5/TiO_2 catalysts showed the highest NO_x conversion over all temperature range, the formation of N_2O during SCR reaction exceeded reference catalyst (V_2O_5/TiO_2) especially above $350^\circ C$. However, Mn and Zr promoted V_2O_5/TiO_2 catalysts demonstrated least N_2O formation as well as excellent NO_x conversion above $350^\circ C$. In addition, impregnating vanadium first then promoter later showed the least production of N_2O during SCR reaction.