

Suppressed N₂O formation during NH₃ selective catalytic reduction using vanadium on zeolitic microporous TiO₂

이승관, 이현정, CHANGSHUAI, 윤승희¹, 송인학¹, 김도희¹, 조성준[†]
전남대학교; ¹서울대학교
(sjcho@chonnam.ac.kr[†])

Emission of N₂O from mobile and off-road engine is now being currently regulated because of its high impact compared to that of CO₂, thereby implying that N₂O formation from the exhaust gas aftertreatment system should be suppressed. Selective catalytic reduction using vanadium supported TiO₂ catalyst in mobile and off-road engine has been considered to be major source for N₂O emission in the system. Here we have demonstrated that vanadium catalyst supported on zeolitic microporous TiO₂ obtained from the hydrothermal reaction of bulk TiO₂ at 400 K in the presence of LiOH suppresses significantly the N₂O emission compared to conventional VO_x/TiO₂ catalyst, while maintaining the excellent NO_x reduction, which was ascribed to the location of VO_x domain in the micropore of TiO₂, resulting in the strong metal support interaction. The use of zeolitic microporous TiO₂ provides a new way of preparing SCR catalyst with a high thermal stability and superior catalytic performance. It can be also extended further to the other catalytic system employing TiO₂-based substrate.