Controlled vanadyl species on hexagonal boron nitride for selective catalytic reduction of NO with NH_3 in wide temperature window

이명진[1,2], 정보라[1], 이금연[1], 임한규[1], 예보라[1],
김태욱[1], 김홍대[1,†]
[1]한국생산기술연구원; [2]울산과학기술원
(hdkim@kitech.re.kr†)

One of recent spotlighted issue is particulate matter which also generated from gaseous pollutants and NO_x occupies the largest proportion among them. A commonly abatement technology of NO_x is selective catalytic reduction with NH_3 (NH_3-SCR) as reductant, and vanadium-based catalyst is commercialized with titanium dioxides (TiO_2) and tungsten as promoter. However up to present, because operating temperature of V-based catalyst is the range from 300 to 380 °C, the necessary of modified V-based catalyst capable of operation in the lower and wider temperature due to further tighten environmental regulation in various fields in the future. According to the previous literature, vanadium exhibits four common oxidation states (+5, +4, +3, and +2) having characteristic aqueous colors, among which V^{4+} and V^{3+} are the better SCR performance than general oxidation state, V^{5+}. Therefore, the vanadyl oxidation states are main factor in modifying V-based catalyst for low temperature drive, and the SCR performance is further enhanced by deflocculated particle on porous hexagonal boron nitride (h-BN).