

Adsorption and decomposition of N<sub>2</sub>O on  
Fe-TiO<sub>2</sub>-supported V<sub>2</sub>O<sub>5</sub>-WO<sub>3</sub> catalysts

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This study has been focused on the ability of Fe<sup>2+</sup>-exchanged titania-supported V<sub>2</sub>O<sub>5</sub>-WO<sub>3</sub> catalysts to adsorb and decompose N<sub>2</sub>O. A sample of a 1.36% Fe<sup>2+</sup>-TiO<sub>2</sub>-supported V<sub>2</sub>O<sub>5</sub>-WO<sub>3</sub> catalyst gave peaks near 2234 and 2265 cm<sup>-1</sup> which are similar to those by N<sub>2</sub>O adsorbed on a Fe-ZSM-5 sample. Thus, they could be assigned to N<sub>2</sub>O adsorbed on Fe<sup>2+</sup> sites. The intensity of the both peaks decreased with an increase in Fe amounts, which might be because of the formation of Fe(O)<sub>x</sub> on the catalyst surface. Similar peaks even on the bare titania appeared and N<sub>2</sub>O interacts with not only Fe<sup>2+</sup> sites but also with Ti<sup>n+</sup> sites. The decomposition of N<sub>2</sub>O could take place over the Fe<sup>2+</sup>-TiO<sub>2</sub> although this was quickly deactivated by O atoms generated in N<sub>2</sub>O decomposition process. It is proposed that the Fe<sup>2+</sup>-TiO<sub>2</sub>-promoted catalysts can play a role for the decomposition of N<sub>2</sub>O from NH<sub>3</sub>-SCR reaction.