Adsorption and desorption of NH_3 and NO on Fe-zeolite-promoted V_2O_5-WO_3/TiO_2 catalysts

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This study has been focused on the adsorption and desorption of NH_3 and NO on samples of a commercial V_2O_5-WO_3/TiO_2 catalyst with a promotor of Fe-MFI with a 96% exchange level to acquire a key role of the Fe ions in lowering the extent of the production of N_2O in the selective reduction of NO by NH_3. The bare V_2O_5/TiO_2-based catalyst after adsorption of NH_3 at 100°C following temperature-programmed desorption up to 500°C yielded a strong peak of N_2O at 375°C with a weak band near 310°C. These desorption peaks all disappeared as the titania-supported vanadia sample was promoted using the Fe-MFI, although a new N_2O peak was generated around 330°C but this peak intensity depending on the Fe-zeolite quantities became visibly reduced. These results propose that such a utilization of Fe-zeolites as a promotor in V_2O_5/TiO_2-based catalysts can significantly suppress the extent of N_2O formation in NH_3-SCR reaction.