

Passive SCR catalyst for simultaneously removing NO<sub>x</sub> using hydrocarbon in stationary source exhaust gas

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Recently, SCR technology to remove NO<sub>x</sub> using NH<sub>3</sub> has developed dramatically with increasingly stringent environmental regulations. However, the use of NH<sub>3</sub>, a reducing agent, has many problems, including NH<sub>3</sub> slip and excessive cost of installing and maintaining devices. Removing NO<sub>x</sub> by using hydrocarbon contained in the exhaust gas from stationary source, environmental and economical effects can be obtained at the same time.

In this study, we intend to develop SCR catalyst that can effectively remove NO<sub>x</sub> by using VOCs, which are hydrocarbons emitted a lot from stationary sources, as a reducing agent. Single or bimetal use of transition metals, rare earth metals, etc., catalyst supports, and the reaction conditions have greatly affected on the catalytic activity. The surface properties and oxidation-reduction mechanism of the catalyst were investigated by XRD, N<sub>2</sub> adsorption isotherm, XPS, SEM, TEM, TPR/TPD, and catalytic performance was evaluated by reaction with NO<sub>x</sub> using toluene as a reducing agent. By comprehensively reviewing these results, we intend to use them to understand the reaction and design modified catalyst.