

The synthesis and characterization of Urea-SCR catalyst for exhaust gas (NO_x) after-treatment of CNG engine

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General exhaust gas after-treatment system such as Urea-SCR is consisted of catalyst coated ceramic substrates. However, it is focused that working temperature is under 500[°C] because of the features of diesel engine. In this study, we suggest that modified catalyst and coating procedure can dramatically improve stability and performance of system at the temperature range of 400~700[°C]. There are many catalysts for DeNO_x, but are easily degraded above 400[°C] and stability of catalysts is also decreased. Especially, zeolite based catalysts are not stable in the Urea-SCR system for CNG engine's exhaust gas treatment. This problem can be attributed to zeolite properties, but more important thing is kinetic interaction between zeolite and ceramic materials. The synthesis of catalysts for DeNO_x at high temperature is based on conventional impregnation method and then catalyst coating on ceramic substrate is carried out using modified wash coating procedure. At the temperature of 650[°C], the NO_x conversion efficiency is above 90[%] and catalytic stability is also good without destruction of catalyst. Herein, our technology is challenging, and can be applied to the Urea-SCR system, exhaust gas after-treatment system, for CNG engine's emission standard in the future.