

Simultaneous improvement of ammonia mediated NO_x SCR and soot oxidation for enhanced SCR-on-Filter application

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Description

The integration of NO_x reduction and catalytic soot oxidation was investigated for the SCR_oF (Selective Catalytic Reduction on Filter) applications. By physically mixing a commercial SCR catalyst (either Fe- ZSM-5 and Cu-ZSM-5) with a soot oxidation catalyst (K/CeO₂-PrO₂), it was possible to lower the soot oxidation temperature by more than 150 degrees and, by optimizing the catalysts mass ratio in the mixture, NO_x conversion simultaneously increased, because NO oxidation induced a fast SCR reaction pathway, unlike during standard SCR. Such an improvement in NO_x conversion was more pronounced with the Fe-ZSM-5 than with the Cu-ZSM-5 zeolite, as the latter was more sensitive to the NO₂/NO_x ratio. In order to make the soot oxidation catalyst inactive towards ammonia oxidation, poisoning of the surface acid sites with 3.0 wt.% K₂CO₃ (corresponding to only 1.0 wt.% K) was performed. In the soot ...