

On-Filter Integration of Soot Oxidation and Selective Catalytic Reduction of NO_x with NH₃ by Selective Two Component Catalysts

Authors

Ferenc Martinovic, Tahrizi Andana, Fabio Alessandro Deorsola, Samir Bensaid, Raffaele Pirone

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Abstract

A group of catalysts was developed with the purpose of enhancing the soot oxidation in the selective catalytic reduction on filter system, without negatively effecting the NO_x conversion associated to NH₃ oxidation. The impregnation with alkali metal of a series of supports, characterized by a lack of strong superficial acid sites, improved soot oxidation simultaneously preventing ammonia adsorption, thus its catalytic oxidation. Strong synergy was observed between a ZrO₂-CeO₂ support and potassium, decreasing the T₅₀ of the soot conversion of 170 °C in loose contact. This catalyst was added to a Fe-ZSM5 selective catalytic reduction (SCR) catalyst without negative effect for the SCR activity. The complex interaction between the potassium-based soot oxidation catalyst and the SCR one was investigated. The soot-soot oxidation catalyst-SCR catalyst contact mode was found to be a key factor and the ...