

Simulation of NO_x and soot abatement with Cu-Cha and Fe-ZSM5 catalysts

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Description

The embodiment of the NO_x selective catalytic reduction (SCR) functionality in a diesel particulate filter (DPF), so-called SCR-on-Filter (SCRoF), is investigated through numerical modeling with SCR kinetics corresponding to Cu-Chabazite and Fe-ZSM5 catalysts. The results of the simulations of the SCR activity, performed in the absence and presence of soot, indicate that the presence of soot negligibly affects the NO_x conversion efficiency, given the slow dynamics of passive regeneration. Conversely, the reduction in cake thickness by soot passive oxidation is significantly different in the absence of SCR activity (uncatalyzed DPF) compared to that in its presence (SCRoF). In fact, in the SCRoF only 60–80% of the original soot consumption obtained in the absence of SCR reaction over 1 h can be achieved. Individual Cu-Chabazite and Fe-ZSM5 catalysts, as well as in-series layers of the two catalysts, are ...