

Improved Soot Combustion in DPF Catalyzed by Ceria Nanofibers: The Importance of Soot-catalyst Contact

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Description

Ceria nanofibers were synthesized as soot oxidation catalysts. The morphology of the catalyst was tailored to maximize the contact between the soot particles and the catalyst. Of the synthesized catalysts, the fibrous shape was the most active toward soot oxidation: the peak combustion temperature was reduced from 600 C (non-catalytic combustion) to 375 C during tight contact, 428 C during prolonged loose contact (see detailed definition in the text), and 553 C during loose contact. These results were compared to a very active ceria catalyst generated using the Solution Combustion Synthesis method and characterized by its high porosity and SSA surface. However, although the nanofibers have one fifth of the BET that the nanopowders obtained with SCS have, they display almost the same activity under tight conditions and considerably better activity during prolonged loose contact: their peak temperature was ...