

Nanostructured ceria-based catalysts for soot combustion: investigations on the surface sensitivity

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Description

A set of ceria nanomaterials with different topological and textural properties has been prepared to investigate the shape-dependency activity of ceria towards soot combustion under different reaction conditions (namely in “loose” and “tight” contact). The physico-chemical properties of the prepared catalysts have been studied using complementary techniques. The best performances, in terms of the total oxidation of soot, have been achieved for the CeO₂-nanocubes, due to the abundance of coordinative unsaturated atomic sites on the (1 0 0) and (1 1 0) exposed surfaces (namely truncated nanocubes). However, better results, in terms of the onset of soot oxidation, have been obtained for high-surface-area materials, thus reflecting the key role of surface area at low temperatures. Activity tests have suggested the surface-sensitivity of soot oxidation over the prepared ceria-based materials, when the reaction ...

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