

# Contact dynamics for a solid–solid reaction mediated by gas-phase oxygen: Study on the soot oxidation over ceria-based catalysts

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## Description

Ceria-based catalysts with different topological and textural properties have been prepared to study the role of the soot-catalyst contact on the soot oxidation reaction. The physico-chemical features of the catalysts have been investigated by means of complementary techniques, such as powder XRD, N<sub>2</sub> physisorption at –196 °C, optical microscopy at variable temperature, FESEM, TEM, and thermogravimetric analysis.

As a whole, the best catalytic activity has been obtained with the CeO<sub>2</sub>-nanocubes (denoted to as “Ce-NC”) because of their higher intrinsic reactivity. On the other hand, high-surface area materials prepared by the cerium nitrate decomposition (denoted to as “Ce-ND”) or hydrothermal route (CeO<sub>2</sub>-stars, referred to as “Ce-SAS”) resulted less effective toward the soot combustion, confirming the surface-sensitivity for this reaction.

Moreover, it has been proven a higher dependence of the oxidation ...