

CO Oxidation on Ceria-Based Nanocatalysts: Cooperative and Non-Cooperative Behavior for a Structure-Sensitive Reaction

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Publication date

2017/6/1

Journal

Advanced Science Letters

Volume

23

Issue

6

Pages

5916-5919

Publisher

American Scientific Publishers

Description

Ceria-based catalysts (namely, CeO₂, CePrO_x and CePrZrO_x) have been prepared to investigate the structure-dependency for the CO oxidation. Then, it has been proved that the CO oxidation over ceria nanocatalysts depends on the presence of highly reactive (100) and (110)-type planes. The best performance has been achieved for the Ce-NC catalyst because of the higher amount of low-index surfaces on the CeO₂-nanocubes. For catalysts prepared by the Solution Combustion Synthesis (SCS), higher CO conversion values have been reached with ternary and binary oxides rather than with pure ceria, and the following activity order can be drawn: Ce-SCS < CePr-SCS < CePrZr-SCS. Therefore, the presence of Zr and Pr species into the ceria framework improves the catalytic performance, showing a cooperative behavior among the Ce/Pr/Zr/O sites. On the other hand, the oxidation activity with the nanocubic ...