

Novel Mn–Cu-Containing CeO₂ Nanopolyhedra for the Oxidation of CO and Diesel Soot (Part II): Effect of Oxygen Concentration on the Catalytic Activity

Authors

Melodj Dosa, Marco Piumetti, Samir Bensaid, Nunzio Russo, Debora Fino

Publication date

2019/1/15

Journal

Catalysis Letters

Volume

149

Issue

1

Pages

107-118

Publisher

Springer US

Description

In this work, ceria-based nanocatalysts mixed with copper and manganese were studied. All the catalysts were synthesized via the hydrothermal procedure. Four samples were prepared here denoted through the atomic ratios of the metals in the mixed oxide: Ce_{0.95}Mn_{0.05}, Ce_{0.95}Cu_{0.05}, Ce_{0.95}Mn_{0.025}Cu_{0.025} and CeO₂. The samples were tested for the CO and soot oxidation reactions with different gas-phase oxygen concentrations (10, 1.0, 0.5 and 0.02 vol% O₂). As a whole, the most promising catalysts for the CO oxidation reaction are the Ce_{0.95}Cu_{0.05} and Ce_{0.95}Mn_{0.025}Cu_{0.025} samples. Indeed, the presence of Cu species in the solid enhances the surface redox mechanism for the CO oxidation. High vol% O₂ values lead to competitive CO and O₂ adsorption on the catalyst surface thus reducing the catalytic performances for binary and ternary oxides. On the other hand, the CO oxidation ...