Shape Effect of Ceria Nanocrystal Support for PROX reaction with Various Metal Catalysts

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Ceria-based materials were studied for preferential CO oxidation(PROX) reaction. The effect of ceria shape and metal loading on the shaped support were investigated. Ceria and ceria based materials have important applications in fields such as oxidation catalysts, fuel cell electrolytes, etc. In this study, we synthesized various shapes of ceria nanocrystals(rods, -cubes, and -octahedra) by hydrothermal methods. Then, Au, Pt, and Cu with loading of 1 and 4 wt% were deposited on each shape of ceria. The morphology and activity of ceria catalysts were characterized by TEM, H2-TPR, and CO-TPR. The effect of ceria nanocrystal shapes and metal loading on the reducibility of the surface oxygen of ceria was measured by TPR. And the catalysts were evaluated for the CO oxidation in presence of excess H2.