

Shape Effect of Ceria Support Nanocrystals for PROX reaction

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Preferential CO oxidation catalysts was studied for various shapes of ceria nanocrystals and ceria-based materials. Ceria has wide applications in fields such as oxidation catalysts, fuel cell electrolytes, etc. due to its unique high oxygen storage capacity. In this study, we synthesized various shapes of ceria nanocrystals(rods, -cubes, and -octahedra) by hydrothermal methods. Then using each shape of ceria as supports, Au, Pt, and Cu species were deposited on ceria by a deposition/precipitation method. The morphology and activity of ceria catalysts were characterized by TEM, HRTEM, H₂-TPR, and CO-TPR. The effect of ceria nanocrystal shapes and metal deposition on the reducibility of the surface oxygen of ceria was investigated by TPR. And the catalysts were evaluated for preferential CO oxidation with gas flow of H₂(50%), O₂(1%), CO(1%), and He as balance.