

Pd catalysts supported on Highly Ordered Mesoporous Metal Oxides for Low Temperature CO oxidation

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The oxidation of carbon monoxide (CO) at low temperatures has attracted because it is important for a cleaner exhaust gas, e.g. in automobile or industrial emission control. Catalysts containing noble metals such as Au, Pt, Pd have been proved very effective for CO oxidation at low temperature.

Recently, mesoporous materials are widely used for catalysts and supports because of the unique catalytic properties attributed to high surface area and easy accessibility to active sites. In this work, a series of crystalline three-dimensional mesoporous metal oxides were prepared using the mesoporous silica KIT-6 as a template. And Pd supported on mesoporous metal oxides was prepared by an incipient wetness method. The Physicochemical properties of mesoporous metal oxides (meso-MO_x) and Pd-supported on mesoporous metal oxides (Pd/meso-MO_x) were characterized by electron microscopy, X-ray diffraction, N₂ adsorption-desorption, CO-temperature programmed (CO-TPR) reduction, H₂-temperature programmed reduction (H₂-TPR) and O₂-temperature programmed oxidation (O₂-TPO). Pd/meso-MO_x Catalysts exhibited higher catalytic activities than the corresponding meso-MO_x catalysts.