

Preferential oxidation of CO by CuO-CeO<sub>2</sub> mixed oxide catalyst

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For the preferential oxidation of CO contained in the fuel for polymer electrolyte membrane fuel cell, CuO-CeO<sub>2</sub> mixed oxide catalysts were prepared by the sol-gel method and impregnation method to replace noble metal catalysts. In the catalyst preparation by the sol-gel method, Cu-Ce content and hydrolysis ratio ([H<sub>2</sub>O]/[ATSB]) were changed. The catalytic activities of the prepared catalysts were compared with a commercial noble metal catalyst, 1 wt% Pt/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> [Aldrich Co.]. With increasing hydrolysis ratios in the catalyst preparation, particle size decreased and surface area increased, and catalytic activity also increased. The highest CO conversions with the CuO-CeO<sub>2</sub> mixed oxide catalyst prepared by impregnation method and the commercial catalyst (1wt% Pt)/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub>) were 82 and 81% at 150°C, respectively, whereas the highest CO conversion with the CuO-CeO<sub>2</sub> mixed oxide catalyst prepared by the sol-gel method was 90% at 150°C. This indicates that the catalyst prepared by the sol-gel method shows higher catalytic activity than the catalysts prepared by the impregnation method and commercial catalyst. From the CO-TPD experiment, it was found that the catalyst showing CO desorption peak at lower temperature revealed higher catalytic activity.