

WGS reaction over ceria-zirconia supported metal catalysts for fuel processor and hydrogen station applications

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The water gas shift (WGS) reaction is crucial in producing pure hydrogen. Since the 1960s, copper-based catalysts (Cu-Zn/Al₂O₃) have been widely used in the commercial low temperature shift (200-250°C). Also, the Cu-Zn/Al₂O₃ catalyst were designed to operate under steady-state conditions in large-scale industrial plants. Thus, this catalyst is not suitable for use in residential or automotive fuel processor because of the rapid deactivation tendency under severe conditions. The WGS reaction over copper modified catalysts supported on ceria-zirconia was investigated to develop an alternate commercial Cu-Zn/Al₂O₃ catalyst. A series of Cu modified catalysts was prepared, characterized, and tested for the WGS reaction.