

Advanced Pt catalyst for a single stage water-gas shift reaction

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The water-gas shift (WGS) reaction ($\text{CO} + \text{H}_2\text{O} = \text{CO}_2 + \text{H}_2$, $\Delta H = -41.1 \text{ kJ/mol}$) and its catalyst (CuZnO-based catalyst for a low-temperature stage and FeCr-based catalyst for a high-temperature WGS reaction stage) are well established in industrial operations such as ammonia and hydrogen production plants. The WGS reaction, especially a single stage WGS reaction at a medium temperature range, has been reobtained worldwide attention due to its application in clean power generation systems in recent years. In this study, the series of Ti modified Pt/ZrO₂ catalyst was prepared for a single stage WGS reaction to enhance the catalytic activity and the Ti addition effect has been investigated on the reducibility and WGS reaction performance of Pt/ZrO₂.