

Effect of the redox properties of support oxide over cobalt-based catalysts in high temperature water-gas shift reaction

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A series of cobalt-based catalysts supported on CeO₂, ZrO₂, TiO₂, and Al₂O₃ were prepared by the incipient wetness impregnation method and applied for the high temperature water-gas shift reaction. Among the prepared catalysts, Co/CeO₂ catalyst showed the highest CO conversion as well as the most stable catalytic performance in a very high GHSV of 143,000 h⁻¹. The excellent activity and stability of the Co/CeO₂ catalyst were attributed to its high metal dispersion, which is found to be strongly dependent on the reducible nature of the CeO₂ support.