The Enhanced Activity and Stability for The Reverse Water Gas Shift Reaction Operated at High-Temperature over The CuO-Fe_2O_3 supported on ɣ - Alumina Catalysts

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Reverse water gas shift (RWGS) reaction has been widely used to adjust H_2/CO ratio in many industrial applications, such as ammonia and methanol synthesis, Fischer-Tropsch synthesis, which require different H_2/CO ratio. Generally, a mixture of Cu, ZnO and Al2O3 at varying composition is a catalyst for low-temperature shift reaction that occur below 300 °C and high-temperature shift reaction catalyst such as Fe_2O_3/Cr_2O_3 is usually operating in temperature range of 310 ~ 450 °C. On the other hand, the study of the activity and stability for the RWGS reaction operated above 600 °C has been rarely studied. In this study, 1 wt % Fe supported on gamma-alumina (ɣ-alumina) with various Cu contents (0, 1, 2, 4 wt %) were successfully synthesized via melt-infiltration, followed by calcination at 700 °C. In addition, the activity and stability of RWGS reaction over these catalysts was studied at extremely high temperature (700 °C).