

The activity of Water-gas-shift reaction over CuO-ZrO₂ catalyst

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The activity of CuO-ZrO₂ catalysts for water gas shift reaction (WGSR) was studied. All the catalysts with different CuO-ZrO₂ atomic ratios used in this study were prepared by coprecipitation method. The optimum composition for high WGSR activity was 50at.%CuO-ZrO₂ catalyst. Its catalytic activity below 180°C was better than a commercial catalyst (CuO/ZnO/Al₂O₃) owing to the cooperative effect of copper and zirconium. Thus, CuO-ZrO₂ catalyst was found to be an attractive low-temperature water gas shift reaction catalyst. On the activity of CuO-ZrO₂ catalysts, a positive effect of H₂O and a negative effect of H₂ and CO₂ were observed. The catalysts were characterized by H₂-temperature programming reduction (H₂-TPR), N₂O chemisorption and X-ray photoelectron spectroscopy (XPS).