

A study on the effect of promoter in Cu-CeO₂ catalyst synthesized by sol-gel process for the low temperature water-gas shift reaction

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The low temperature water-gas shift (LT-WGSR) reaction has been carried out at gas hourly space velocity (GHSV) of 36,000 mL/g·h over Cu-CeO₂ catalysts prepared by citric acid assisted sol-gel process. To identify the effect of promoters on physico-chemical properties and catalytic performance of Cu-CeO₂ catalyst, representative additives having the effect of improving oxygen storage capacity (Zr, Ti) and Cu dispersion (Mn, Ga) were applied, respectively. The effect of promoters on the physico-chemical properties related with catalytic performance of Cu-CeO₂ catalysts were interpreted through various characterization techniques such as N₂ physisorption, TPR, XRD, N₂O-titration, and Raman spectroscopy. The characterization results for the catalysts were correlated with catalytic activity results in the LT-WGSR.