

Comparison on magnetite catalysts incorporated with Me(Cu, Ni, Zn, and Co) for high temperature water-gas shift reaction from waste derived synthesis gas

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A comparative study on Fe_3O_4 with Cu, Ni, Zn and Co catalysts(Me-Fe-Al-Glycine, Me-FAG) have been carried out in the High Temperature Water Gas Shift (HT-WGS) reaction using waste derived synthesis gas. Catalysts were prepared by sol-gel method using glycine. The Physicochemical properties of the prepared catalysts were compared by BET, XRD and H_2 -TPR. Experimental results revealed that Cu-FAG exhibited higher catalytic performance than others Me-FAG catalysts. Also, the loading amount of Cu was varied range from 2.5 mol% to 15.0 mol% for optimization. As a result, 12.5mol% Cu-FAG catalyst showed the outstanding catalytic performance ($X_{\text{CO}} = 87\%$ at 400 °C) and it was found to be a promising catalyst for high purity hydrogen production in HT-WGS reaction.

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