Effect of $ZnAl_2O_4$ Phase on Modified $CuZn/ZnAl_2O_4$ Catalyst for the Production of Methanol

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Research on carbon neutrality has been concentrated worldwide, and the methanol synthesis reaction is attracting attention as a carbon reduction catalyst. Methanol is one of the most widely used chemicals in the world, which is used as a raw material for the production of petrochemical products or as an environmentally friendly fuel for vehicles. In this study, various $ZnAl_2O_4$ support were prepared by co-precipitation method. $CuZn/ZnAl_2O_4$ catalysts were made by deposit co-precipitation method for methanol synthesis. $Cu/Zn/Al_2O_3$ catalysts were prepared by co-precipitation method as well. The prepared catalysts were characterized by N_2 physical adsorption, H_2-TPR, XRD, XRF, and the like. The methanol synthesis reaction was carried out in a fixed bed reactor using a mixed gas of H_2 / CO / CO_2 / N_2 under the 250C°, 4,000 h^{-1} of GHSV, and 40 bar. Consequently, $CuZn/ZnAl_2O_4$ catalysts have showed higher thermal stability and low sintering that $Cu/Zn/Al_2O_3$ catalyst.