

Effect of Preparation Method of the Cu/ZnO catalyst On the Catalytic Performance for Methanol Synthesis

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Preparation method of the Cu/ZnO-based catalysts can greatly affect the catalytic activities in methanol synthesis. Methanol synthesis has been studied for a great span of years because methanol can be converted to other alternative resources. Recently the development of MeOH-FPSO is gaining attention. To design a compact and effective catalyst, it is important to know the effects of preparation method on the catalytic effects. Precipitation conditions, such as aging temperature, time and precipitating agent all play an important role in catalytic performance of methanol synthesis catalysts. The amount of Cu loaded on the catalysts and the metallic surface area of active metal are considered to be key factors in making catalysts with high selectivity and stability. A series of Cu/ZnO-based catalysts were prepared through various preparation methods to confirm these effects. The prepared catalysts were characterized by N₂ physisorption, CO chemisorption, TPR, and SEM techniques. The performance for methanol synthesis was evaluated in a fixed bed reactor system with the H₂/CO ratio of 2:1, reaction temperature of 290°C and reaction pressure of 35bar.