

Development of LNG-grade synthetic natural gas production technology based on coal gasification

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In the commercial SNG (Synthetic Natural Gas) synthesis process based on coal gasification, the methane selectivity is about 98%. Methane, the main components of SNG, has a calorific value of 8,107 kcal/Nm³, which is below domestic pipe network standards (10,500 kcal/Nm³). In this study, we aimed to develop a catalyst for production of high calorific value SNG based on coal gasification. We designed the reaction based on Fisher-Tropsch process which product has alkane of less than 5 carbon chain. Experiments were conducted in a fixed bed reactor and the promoter characteristics of Mn, Mo and Zr were determined on Cobalt base catalyst at 300 °C, 10 bar, CO : H₂ = 1 : 3.1 and GHSV = 5000 h⁻¹. As a result, Co₁₀/SiO₂ catalyst showed 95% carbon monoxide conversion, 57% methane selectivity and 20.7% C₂-C₄ selectivity.