

Production of C₂-C₄ paraffinic hydrocarbons over Co-Fe catalysts

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Synthetic Nature Gas (SNG) has attracted much attention and been commercially produced from different starting materials. However, its heating value is deficient than standard heating value for power generation (especially in South Korea and Japan). Thus, heating value of SNG can be improved by adding paraffinic hydrocarbons (C₂-C₄) through Fischer-Tropsch synthesis. In this study, Co-Fe catalysts supported on γ -alumina were investigated for the production of C₂-C₄ paraffinic hydrocarbons. XRD and H₂-TPR results are found that cobalt improved reducibility of iron in high cobalt-to-iron catalysts. This is mainly because incorporation of cobalt into Fe₂O₃ weakened the strong interaction between iron and γ -alumina support, resulting in decrease of reduction temperature. In addition, activity tests of Co-Fe catalysts were conducted to investigate effect of cobalt-to-iron ratio on catalytic performance. Of all catalyst, 5Co-15Fe showed the best performance with 91.2 % CO conversion, 28.2 % C₂-C₄ selectivity, at 300 °C.