

CO₂ hydrogenation to synthetic natural gas on ordered mesoporous Co-Al mixed metal oxide catalyst

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CO₂ conversion into value-added products such as hydrocarbons or alcohols has been widely researched. In the case of methanation reaction, it is preferred to lead a simultaneous production of small amount of light hydrocarbons such as ethane and propane due to their higher heating value. Although cobalt-based catalysts have shown high methanation activity on CO₂ hydrogenation as well as Fischer-Tropsch synthesis (FTS) activity, the ordered mesoporous Co-Al mixed metal oxides have potential to produce the synthetic natural gases with a higher heating value. The highly ordered mesoporous Co-Al mixed metal oxide (m-CoAl) revealed a stable catalytic and structural stability. The irreducible Al₂O₃ framework not only enhances structural stability and CO₂ hydrogenation activity, but also suppresses the activity toward heavier hydrocarbons.