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SCIENTIFIC & RESEARCH PROJECTS

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Project Title:

Effects of Nickel Aluminate Spinel (NiAl₂O₄) as Catalyst Support and Promoters (Ru, Rh) in Fischer-Tropsch Synthesis

Abstract:

The novel NiAl₂O₄ spinel was used as support to synthesis cobalt catalysts and investigated for Fischer-Tropsch synthesis. The physicochemical properties of the synthesized catalysts (Co/NiAl₂O₄, Co/Rh/NiAl₂O₄, Co/Ru/NiAl₂O₄ and Co/γ-Al₂O₃) were characterized by XRD, BET, ICP, SEM, FESEM, HRTEM, TPR and TGA analysis before reaction. It was shown the use of novel NiAl₂O₄ support that was prepared by a modified sol-gel process had a good dispersion. Besides that, Nickel aluminate decreased the interaction of Co and support and resulting in a significant increase in the reduction degree and the catalytic activity. The catalyst of 15Co/0.5Rh/NiAl₂O₄ shows the highest catalytic activity. It is worth noting that the NiAl₂O₄ support decreased the CH₄ selectivity but enhanced the C₅+ selectivity and catalytic stability.