



Effect of Cobalt Catalyst Confinement in Carbon Nanotubes Support on Fischer-Tropsch Synthesis Performance

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Abstract:

Pre-treating the multi-walled carbon nanotubes (CNTs) support by refluxing in 35 vol% nitric acid followed by heating at the temperature of 600 to 900 °C resulted in the formation of defects on the CNTs. Increasing the temperature of the pre-treatment of the CNTs from 600 °C to 900 °C, enhanced the fraction of cobalt-oxide nanoparticles encapsulated in the channels of CNTs from 31% to 70%. The performance of Co/CNTs in Fischer-Tropsch synthesis (FTS) was evaluated in a fixed-bed micro-reactor at a temperature of 240 °C and a pressure of 2.0 MPa. The highest CO conversion obtained over Co/CNTs.A.900 was 59% and it dropped by ~3% after 130 h of time-on-stream. However, maximum CO conversion using Co/CNTs.A.600 catalysts was 28% and it decreased rapidly by about 54% after 130 h of time-on-stream. These findings show that the combined acid and thermal pre-treatment of CNTs support at 900 °C has improved the stability and activity of the Co/CNTs catalyst in FTS

Biography:

Dr. Omid Akbarzadeh Pivezhzani is working with Nanotechnology and Catalysis Research Centre since 2016. His main research area is heterogeneous catalysis and catalytic reaction engineering. He has spent 10 years in academic-industrial projects as a research officer and post-doctoral. Dr. Omid has worked 5 years in the oil and gas industry as a chemical engineer. He developed advanced smart catalysts, especially for the oil and gas industries. Dr. Omid has contributed to two PETRONAS Research Sdn Bhd industrial catalyst projects and worked on an in-



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