Studies on the role of nitrogen in the feed for Fischer-Tropsch synthesis under fixed-bed reactor system

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The rising natural gas demand for GTL energy promoting the case of remote natural gases, nitrogen rich natural gas flared gases and methane. Among them, nitrogen-rich natural gases containing N_2 concentrations ranging from about 10 up to above 85 vol % are available in considerable amounts in many parts of the world. Hence if they have used, upgradiation of the feed pipeline quality by removing N_2 is needed which is very expensive.

The objective of this work is to study the effect of the N_2 on Co based catalyst in the fixed bed reactor for the FTS. To evaluate the effect of N_2 in the feed, the addition of N_2 in the feed was changed from 5 to 50 vol %. It was found that N_2 content above 15 vol % in the feed affect on the diffusion efficiency of CO and H_2, leads to the higher partial pressure ratio of H_2/CO this increased the CO conversion and methane selectivity.