

Fischer-Tropsch Synthesis : The role of acid site over Al-SBA-15 catalysts

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Fischer-Tropsch Synthesis(FTS) is regarded as a key technology which produces liquid fuels from the synthesis gas in GTL-FPSO process. Mesoporous molecular sieves not only should allow for higher active metal dispersion but also make uniform pore size distribution. However there are some reports about silanol groups which lead to retard the reduction of metallic cobalt. In this work, we synthesized Co-based catalyst supported on the modified SBA-15 to obtain the mild reduce condition and selective products with certain carbon number distribution. For the comparison of the acid site, modified SBA-15 was prepared with the molar ratio of Si/Al= 0, 5, 7 and 10 and ZSM-5 was also measured against SBA-15. Catalysts were prepared by impregnation method and prepared catalysts were characterized by N₂ physisorption, NH₃-TPD, TPR, XRD, TGA, SEM and TEM. During the reaction, product gases (C1-C9) are analyzed by online GC and higher hydrocarbons (C5-C44) are analyzed by offline GC and GC-MS. It was found that with the increase of the Si/Al ratio, the interaction between cobalt metal and support was increased.