Effect of H_2S exposure on the deactivation of iron based catalyst in Fischer-Tropsch synthesis

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Fischer-Tropsch synthesis (FTS) was carried out using iron based catalyts prepared by conventional co-precipitation method in a continuous stirred tank reactor (CSTR) with volume of 500cc at 275oC and 25atm using synthesis gas of H2/CO ratio 1 as a simulated feedstock produced from the coal gasifier containing H2S in the range of 0~100ppm. Simulated distillation (SIMDIS) analysis method was used to determine the products distribution. The catalysts physical and chemical properties were analyzed by BET, SEM, PSA, XRD and H2-TPR. Catalyst deactivation on the exposure of H2S was studied by analyzing the catalyst slurry removed from the reactor during the measurement of its activity. Long term test was performed along 500h.