

### Long term activity test of iron based catalysts in CSTR

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Fischer-Tropsch synthesis (FTS) was carried out using iron based catalysts prepared by co-precipitation and incipient wetness method. Supported iron based catalysts activity were compared with that of the catalyst prepared by conventional co-precipitation method. The reaction was carried out in a continuous stirred tank reactor (CSTR) with volume of 500cc at 250°C and 25atm using synthesis gas of H<sub>2</sub>/CO ratio 1 as a simulated feedstock produced from the coal gasifier. 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 H<sub>2</sub>-TPR. Supported iron based catalysts had spherical morphology with particle size of 10~70µm, while the co-precipitated spray-dried catalyst was in the range of 20~120µm. Supported iron based catalysts showed comparable activity in contrast to that of prepared from conventional co-precipitated method. Supported catalysts were expected to have better attrition strength when used in commercial reactor such as slurry bubble column reactor.