

Artificial Pore Control of Co-Based SiC-MgO-Al₂O₃ Composite Catalysts for Synthetic Fuel Production

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Pore size of the pellet-type catalyst supports affects a great influence on the FTS reactivity and product selectivities due to spatial effect of support. The catalyst supports with high surface area usually have a large amount of small pores, which result in poor intra-pellet diffusion efficiency and thus poor selectivity and yield of both reactants, particularly in the multi-phase reactor. However, the meso-macroporous catalyst containing both small pores and large pores has higher diffusion effects and large supported metal area simultaneously, as theoretically proved by Levenspiel.

Therefore, the meso-macroporous catalyst supported on the SiC with the advantageous characteristics mentioned above is promised for excellent performance on the synthetic fuel production as well as the FTS reaction. For this study, we attempted to fabricate meso-macroporous Co/SiC composite supports by introducing artificial pores with a pore forming agent.