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## Fischer-Tropsch synthesis reaction in a novel reactor system of cobalt catalyst coated metallic foam and heat-exchanger type reactor

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**F** ischer-Tropsch synthesis (FTS) reaction is a key step in the gas-to-liquids process that converts natural gas to synthetic fuels such as gasoline, diesel, and wax. It has very specific reaction features such as a highly exothermic reaction and liquid oil production from synthesis gas. The exothermic reaction is strongly related to the heat transfer limitation and the liquid oil production is deeply correlated with the mass transfer limitation in the reaction. Therefore, the ideal reactor for the FTS reaction is considered to have the following characteristics: fixed bed catalyst, high catalyst efficiency due to short diffusion distances, highly efficient gas-liquid mass transfer, and isothermal operation at the highest possible temperatures. In this study, FTS reaction was carried out using a novel system consisting of a cobalt catalyst coated metallic foam and heat-exchanger type reactor. The cobalt catalyst coated metallic foam catalyst was developed with a view to achieving all of the characteristics described in the above ideal reactor. Also, the heat-exchanger type reactor was designed to take into considerationtwo characteristics of the ideal reactor: fixed bed and isothermal operation. Finally, the goal of this study was to concretize the ideal reactor concept and to develop a novel reactor system, avoiding the heat and mass transfer limitations that were the major obstacles to the commercialization of reactors for the FTS reaction.

## **Biography**

Jung-II Yang has completed his PhD at the age of 35 years from Korea University. He was ateam leader of the clean fuel department in Korea Institute of Energy Research (KIER) from 2012 to 2013. He has published more than 21 papers inwell-known journals and has been serving as an editorial board member of catalysis and reaction engineering in KIChE.

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