

Development of an Integrated Dry Reforming of Methane and Fischer-Tropsch Process for Liquid Fuel Production for Reduction in CO₂ Emission

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Recently, as CO₂ regulation gets much stricter due to global warming, CO₂ conversion has attracting much attention as one of the solutions to reduce CO₂ emissions. Dry reforming of methane (DRM) is one of the promising CO₂ conversion reactions because its raw material (natural gas and CO₂) and especially, the high CO₂ feed ratio (CH₄:CO₂=1:1) of the DRM reaction may lead to the high CO₂ consumption rate of the overall process. In addition, the Fischer-Tropsch (FT) process is applied to produce the synthetic fuels such as gasoline and diesel. The overall process is developed by using a process simulator Aspen plus®. CO₂ life cycle assessment (LCA) and economic evaluation are carried out to examine the feasibility of the developed process. Finally, its performance indices are compared with those of the conventional petroleum refinery.