

Modeling of MeOH synthesis process based on the exhaust gas

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Since the exhaust gas, which is generated by running the engines, contains CO₂, which is greenhouse gas, there have been continuous efforts to reduce greenhouse gas emissions worldwide. Recently, dry reforming has received great attention to convert CO₂ to syngas, which can further be used for the synthesis of methanol, as one of the possible applications to turn the exhaust gas into value-added products and reduce the greenhouse gas emission. In this study, we developed the total process model for the conversion of exhaust gas into methanol, which consists of a CO₂ purifying, dry reforming and methanol synthesis units. Since main components of exhaust gas is N₂, Main purpose of CO₂ purifying process is N₂/CO₂ separation. In the CO₂ purifying process, two cases with membrane and acid gas removal unit (AGRU) were compared on the basis of process performance and the entire process model was analyzed to evaluate the reduced amount of CO₂ and the economical benefits of the suggested process.