태양열 집열기용 히트파이프에서 작동유체량이 열특성에 미치는 영향에 관한 실험적 연구

김병기† · 정경택* · 배찬효*(경상대 원) · 서정세**(경상대)

An Experimental Study on the Thermal Characteristics with the Working Fluid Quantity of Grooved Heat Pipe for Solar Collector

B.G. Kim, K.T. Chung, C.H. Bae and J.S. Suh

Key Words: Working Fluid(작동유체), Heat Pipe(히트파이프), Solar Collector(태양열 집열기).

Abstract : Heat pipe can be utilized in many ways such as a heat transfer device in heat recovery system, heat exchanger and stabilizer temperature of electronics devices and solar collector. Especially, This study is aimed to research the thermal characteristics with the quantity of working fluid of grooved heat pipe for solar collector. The heat pipe used in this study has a rectangular grooved wick structure and the quantity of working fluid is charged in the heat pipe with 10cc, 12cc, 15cc and 18cc, respectively. The effects of heat input, coolant temperature, tilt angle and charging quantity of heat pipe have been found. As a result from experiment, the thermal characteristics can be found according to the working fluid quantity of heat pipe for solar collector and the experimental results of charging quantity will be compared with those of analytical quantity.

수소생산을 위한 탄화수소연료의 개질특성에 관한 연구

강인용†(KAIST) · 배규종*(KAIST) · 배중면**(KAIST)

The Study on Hydrocarbon Reforming to Produce Hydrogen

Inyong Kang, Gyujong Bae and Joongmyeon Bae

Key Words: Fuel Cell(연료전지), Hydrocarbon Fuels(탄화수소 연료), Diesel(디젤), GTL

Abstract : Fuel cell requires hydrogen fuel for high electrochemical performance. Generally hydrogen is produced by reforming process using fossil fuel. In this study. various hydrocarbons were reformed. And commercial fuels such as gasoline, diesel and GTL were also investigated. Paraffin-hydrocarbon fuels were easy to be reformed. Maximum reformer efficiency using $C_{16}H_{34}$ is close to 90%. But when 30 vol% aromatic-hydrocarbon fuels are added, reformer efficiency falls down to 67%. Commercial fuels has low efficiency due to aromatics included. Most of all, solid carbons were observed in aromatic-contained fuels by SEM/EDX analysis. Finally paraffins which have long-carbon channel are good candidate fuel in hydrocarbon reforming due to not only hydrogen density but also low possibility of coke formation. Therefore GTL which has low aromatic components and low sulfur is good commercial fuel to produce hydrogen. This has similar performance to $C_{16}H_{34}$.