

## Hydrogen production by ambient temperature atmospheric pressure microdischarge through dimethyl ether or methanol

최명렬, 김종훈, 조원준<sup>1</sup>, 이웅무<sup>2,\*</sup>

아주대학교 에너지시스템공학부; <sup>1</sup>한국가스공사;

<sup>2</sup>아주대학교 화학과

(wmlee@ajou.ac.kr\*)

Atmospheric pressure, non-equilibrium microplasmas have emerged as powerful experimental tools for many industrial applications requiring fast, low energy, low temperature and inexpensive generation of plasmas. The microdischarge was used as a means to decompose some fossil fuels such as DME(dimethyl ether) or methanol for hydrogen production. The discharge, using ~10W AC power of 10~20 kHz or unipolar pulse power, was sustained in the fuel gas flowing through two parallel stainless-steel mesh electrodes 1~3 mm apart. The uniformity of the discharge was sensitive to the wire diameter of the mesh. The typical driving voltage and the electron density were ~2000V and  $10^{11} \sim 10^{12} \text{ cm}^{-3}$ , respectively. With the flow rate of the fuel gas adjusted to be around 100 ml/min the production rate of hydrogen was in the range of 10~40 ml for 100 J of the electrical energy input. DME produced hydrogen gas about 30% higher than methanol fuel does for equal amount of the input energy.