

### Kinetics of Methanol dehydration over $\gamma$ -alumina catalyst

김은영, 정광덕<sup>1,\*</sup>, 주오심<sup>1</sup>, 박영권

서울시립대학교 환경공학과;

<sup>1</sup>한국과학기술연구원 나노환경센터

(jkdc@kist.re.kr\*)

Recent work showed that one step DME synthesis from syngas was the consecutive reaction of methanol synthesis and methanol dehydration. Therefore, it is prerequisite to obtain intrinsic rate equation of methanol dehydration for the design of one-step DME synthesis reactor. In this study, dehydration of methanol on  $\gamma$ -alumina was studied in a continuous-flow reactor at a pressure of 1atm in a range of 240-270°C. The initial rates of reaction for the dehydration of MeOH were measured from MeOH conversion to DME over a various rage of reactant partial pressures (0.2~0.8atm) at four temperatures(T= 240°C, 250°C, 260°C, 270°C), respectively. In the experiments, the apparent order of methanol partial to the rate was one and the apparent activation energy was 77 kJ/mol. With these kinetic data, kinetic equation of Langmuir-Hinshelwood type was obtained.