

Conversion of Hydrocarbons to Hydrogen by Plasma Polymerization and Catalytic Reaction

조은경, 이민근, 조동련†

전남대학교

(dlcho@jnu.ac.kr†)

Conversions of methane, ethane, and propane by plasma polymerization and catalytic reaction were investigated, and their conversions to hydrogen (moles of H₂ produced/moles of CH₄ introduced) were compared. The conversions which were determined by GC-chromatography depended on the gas flow rate and the discharge power for plasma polymerization and the temperature of the catalytic reaction. It increased as the flow rate decreased, the discharge power increased, and the temperature increased. The conversions of propane were higher than those of ethane and methane. The highest conversion was 1.99 for propane, 1.64 for ethane, 1.4 for methane, which was obtained at the gas low rate of 9.8 SCCM, the discharge power of 600 W, and catalytic reaction temperature of 700 °C. And, purity of the produced hydrogen increased as the conversion increased and reached almost 100%.