

## Conversion of Hydrocarbons to Hydrogen by Plasma Polymerization and Catalytic Reaction

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Conversions of hydrocarbon (C1-C3) by plasma polymerization and catalytic reaction were investigated, and their hydrogen yield (flow rate of H<sub>2</sub> in outflow gas / flow rate of hydrocarbon in feed) were compared. The hydrogen yield 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 hydrogen yield of propane(C<sub>3</sub>) were higher than there. The highest hydrogen yield was 1.92 for propane, 1.74 for ethane, 1.41 for methane, which was obtained at the gas low rate of 10 SCCM, the discharge power of 600 W, and catalytic reaction temperature of 600°C(C<sub>3</sub>), 700 °C(C<sub>1</sub>, C<sub>2</sub>). And, purity of the produced hydrogen increased as the conversion increased and reached almost 100%.