

ChangHyun Cho <sup>1</sup>, DaeHyun Choi <sup>1</sup>, HyunJae Park <sup>1</sup>, and JiHun Kim <sup>1</sup>

<sup>1</sup>National Fusion Research Institute, Korea, Republic of

Carbon dioxide recycling is important technology for suppressing the emission of carbon dioxide, which is the main substance of global warming. Carbon dioxide accounts for the largest portion of the greenhouse gases emitted to the atmosphere. Research for decomposing and recycling of carbon dioxide are actively underway. In this study, we produced a hydrogen and carbon monoxide, which are syngas through dry reforming reaction of carbon dioxide and methane using by 915MHz microwave plasma at the atmospheric pressure. To perform a reforming experiment, we fabricated reactor for the large volume plasma discharge and installed a wet scrubber for syngas cooling and carbon removal. The plasma discharge gas were mixed with 0.25 Nm<sup>3</sup>/min of carbon dioxide and 0.15 Nm<sup>3</sup>/min of methane gas was injected into the discharge tube through the holder to discharge the plasma, and the microwave plasma power was fixed to 30kW. We measured the concentration of syngas cooled after the reforming using a gas analyzer. From this result, we evaluated conversion rates of the cold gas efficiency and carbon dioxide and methane.

This work was supported by R&D program of 'Plasma Convergence & Fundamental Research' through the National Fusion Research Institute of Korea (NFRI) funded by the government funds.