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Effect of N_2 on decomposition of CO_2 using a hybrid plasma source KWAN-YONG KIM, KYUNG-HYUN KIM, HO-JUN MOON, BUM-SEOK KIM, CHIN-WOOK CHUNG, Hanyang university — Conversion of carbon dioxide (CO_2) into carbon monoxide (CO) and oxygen (O) is studied using a hybrid plasma source with N_2/CO_2 ratios. The hybrid plasma source consists of an antenna and an electrode, which are connected in parallel. An external variable capacitor (C_v) is installed in series with the antenna which can control current ratio between the antenna and the electrode. This plasma source can selectively control of inductive coupling and capacitive coupling. The Optical emission spectroscopy (OES) is used to measure the intensities of CO_2, CO, and O. Electron temperatures, electron densities and energy probability functions (EEPFs) were measured using a single Langmuir probe. The decomposition energy efficiency and the decomposition efficiency of CO_2 under various discharge conditions are obtained. Experiment shows that high energy electron population increases with N_2 ratio, and CO from CO_2 is increased.

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