

Abstract Submitted
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Mechanism of methane dry reforming using an arc-jet plasma reactor HWANG NA KYUNG, Dept. of Environmental-System Engineering, University of Science and Technology, CHA MIN SUK, HUR MIN, SONG YOUNG-HOON, Eco-Machinery Research Division, Korea Institute of Machinery and Materials — The characteristics of plasma reaction for dry reforming of methane have been studied using an arc-jet plasma reactor with AC power supply. The effects of the operating parameters, which are input power, CO_2/CH_4 ratio, added O_2 ratio, and the portion of CH_4+CO_2 amount in reactants, were investigated by product analysis. As results, the decompositions of CH_4 and CO_2 were enhanced by input electrical power. The amount of produced hydrogen was affected by the supplied power and the portion of CH_4+CO_2 in the reactants, demonstrating increasing behavior with increasing supplied power and the volume of CH_4 and CO_2 . For fuel based energy efficiency, the effect of the supplied power was neutral, while the CO_2/CH_4 ratio and the portion of $\text{CH}_4 +\text{CO}_2$ amount gave a positive impact to the efficiency. Moreover, we could get various H_2/CO ratio ranged 0.8 – 2.5 by controlling the CO_2/CH_4 ratio. Detailed mechanism and characteristics of the dry reforming of methane will be discussed also.

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