

### CO<sub>2</sub> reforming of CH<sub>4</sub> to syngas by DBD plasmas with zeolite catalyst particles

Nguyen Hbang Hai, , , \*

Dry reforming of methane that converts two green-house gases (CH<sub>4</sub> and CO<sub>2</sub>) to syngas (mixture of CO and H<sub>2</sub>) has gained a deep research interest lately. The ratio of H<sub>2</sub>/CO product gases by this process is close to 1/1, which is appropriate for the production of Fischer-Tropsch liquid hydrocarbons and oxygenates. Several technologies were proposed for CO<sub>2</sub> reforming of CH<sub>4</sub>, such as catalytic conversion, plasma conversion and the combination of catalyst and plasmas.

In the catalytic reforming of CO<sub>2</sub> and CH<sub>4</sub>, the carbon deposition leading to deactivation of catalysts is a big problem. The CO<sub>2</sub> reforming of CH<sub>4</sub> has been also investigated by applying the plasma technologies. Recently, the combination of plasmas and heterogeneous catalysis for fuel production from CH<sub>4</sub> reforming has attracted the increasing interest. In this research, we investigated the CO<sub>2</sub> reforming of CH<sub>4</sub> to syngas by the combination of DBD plasmas and zeolite catalyst coated with TiO<sub>2</sub> particles. The effects of several experimental variables such as the ratio of CH<sub>4</sub>/CO<sub>2</sub>, applied voltage and frequency and total gas flow rate were investigated.