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Methane reforming in a temperature-controlled DBD reactor DMITRY LEVKO, LAXMINARAYAN RAJA, The University of Texas at Austin — Methane and carbon dioxide are among the main products of human activity. Therefore, they are considered among greenhouse gases, which may cause the global warming. On the other hand, methane is widely used in everyday life as an energy source and in industry for the synthesis of different chemicals. In order to utilize greenhouse gases or to generate chemicals from methane, one needs first to dissociate it. Then, this gas converts into desired products such as methanol, gasoline, syn-gas etc. Nowadays, there are several methods for CH4 conversion. Steam reforming, partial oxidation, thermal and non-thermal plasmas are among them. During the last decades, the use of non-thermal plasma for methane reforming attracts more and more attention. This is caused by the possibility to control the process of methane conversion as well as the gas component content at the reactor outlet. In addition, the use of non-thermal plasma facilitates the control of reactor start up. The goal of the present work is the deep understanding of the plasma chemical processes accompanying the methane-air conversion in a temperature-controlled DBD reactor. To do this, we have developed the kinetic mechanism of CH4/N2/O2 conversion for the gas temperature range 300-800 K and applied it to the global model.

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