PLASMA CATALYSIS CONVERSION OF HYDROCARBONS IN FLOW OF AIR/CO_2

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Significant part of energy consumed nowadays extracted from fossil fuels. Therefore at the expense depletion of traditional fossil fuels the interest in green energy is growing today. Relevance of efficient use of renewable energy increases (for example: bioethanol, biodiesel). Bioethanol and biodiesel can be obtained from renewable biomass. However, bioethanol require additional activation of combustion. Also it is know that modern technology production of biodiesel are characterized a large percentage of waste (bioglycerol) ~ 10%.

Reforming of hydrocarbons into syn-gas in plasma-liquid system with reverse vortex flow of "tornado" type with liquid electrode (TORNADO-LE) was studied in this paper. The working gas was a mixture of air with CO_2. Bioethanol and bioglycerol was used as model hydrocarbons.

This plasma-liquid system consists of parts where plasma generated and reaction (pyrolytic) chamber in which injected active particles. Plasma was studied using the method of emission spectroscopy. Temperature population of excited levels of atoms (electronic temperature T_e^*), and molecules (vibrational T_v^* and rotational T_r^* temperatures) in discharge plasma were determined by different methods from emission spectra. Relative concentration components of plasma were calculated. For research of gas products at the outlet of the system gas chromatography, mass-spectrometry and infrared spectrophotometry where used. Using these methods were identified components and their ratio in the gas at the exit of the plasma-liquid system. Comparison of experimental data and results of numerical simulation of the basic components of gas mixture at the outlet of the system in case the working fluid - bioethanol was made.