

Abstract Submitted
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Green technology for conversion of renewable hydrocarbon based on plasma-catalytic approach IGOR FEDIRCHYK, OLEG NEDYBAL-IUK, VALERIY CHERNYAK, Taras Shevchenko National University of Kyiv, VALENTINA DEMCHINA, Gas Institute of National Academy of Sciences of Ukraine — The ability to convert renewable biomass into fuels and chemicals is one of the most important steps on our path to green technology and sustainable development. However, the complex composition of biomass poses a major problem for established conversion technologies. The high temperature of thermochemical biomass conversion often leads to the appearance of undesirable byproducts and waste. The catalytic conversion has reduced yield and feedstock range. Plasma-catalytic reforming technology opens a new path for biomass conversion by replacing feedstock-specific catalysts with free radicals generated in the plasma. We studied the plasma-catalytic conversion of several renewable hydrocarbons using the air plasma created by rotating gliding discharge. We found that plasma-catalytic hydrocarbon conversion can be conducted at significantly lower temperatures (500 K) than during the thermochemical (≈ 1000 K) and catalytic (800 K) conversion. By using gas chromatography, we determined conversion products and found that conversion efficiency of plasma-catalytic conversion reaches over 85 %. We used obtained data to determine the energy yield of hydrogen in case of plasma-catalytic reforming of ethanol and compared it with other plasma-based hydrogen-generating systems.

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