

HOMOGENEOUS PYROLYSIS OF *n*-PENTANE UNDER PULSED ADIABATIC COMPRESSION

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Abstract: Thermal decomposition of *n*-pentane has been studied in a rapid compression machine over a range of temperature 670–1160 °C. The main products (ethylene, methane, propylene, hydrogen, butene-1, and acetylene) and minor products of reaction have been determined. Some of them (butyne-1, butyne-2, cyclopentane, isoprene, and other compounds) were identified for the first time. Soot was not found in products. It is shown that the increase of the pyrolysis temperature along with the decrease of the residence time brings to a growth of selectivity of the ethylene formation and to a fall of selectivity of methane and propylene formation. It is determined that the yield of ethylene in the process of *n*-pentane pyrolysis is greater than in the *n*-butane pyrolysis. An optimum value of conversion degree of *n*-pentane at high temperatures does not exceed 92%. Unusual behavior of selectivity of methane and ethane has been revealed and the explanation to this phenomenon is provided.

Keywords: *n*-pentane; pyrolysis; ethylene; rapid compression machine

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