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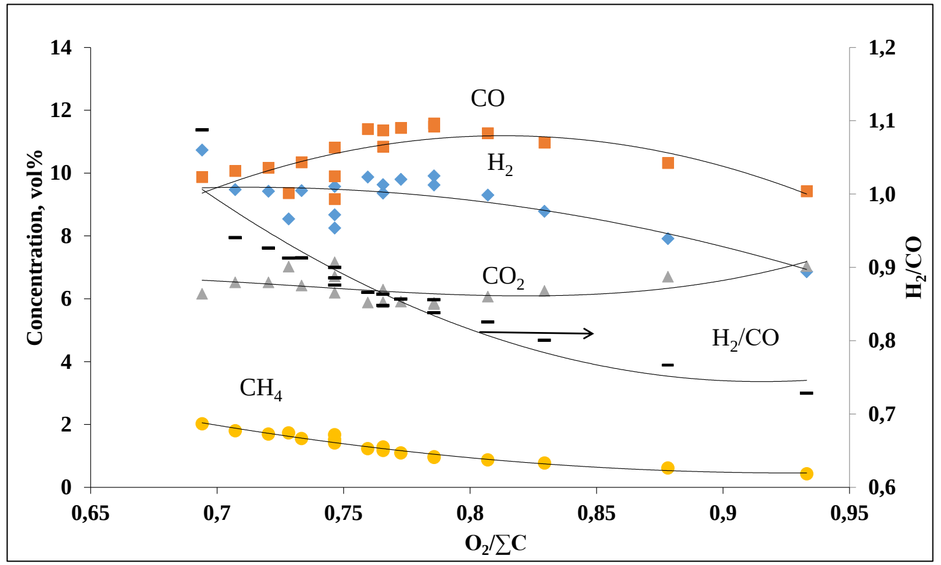
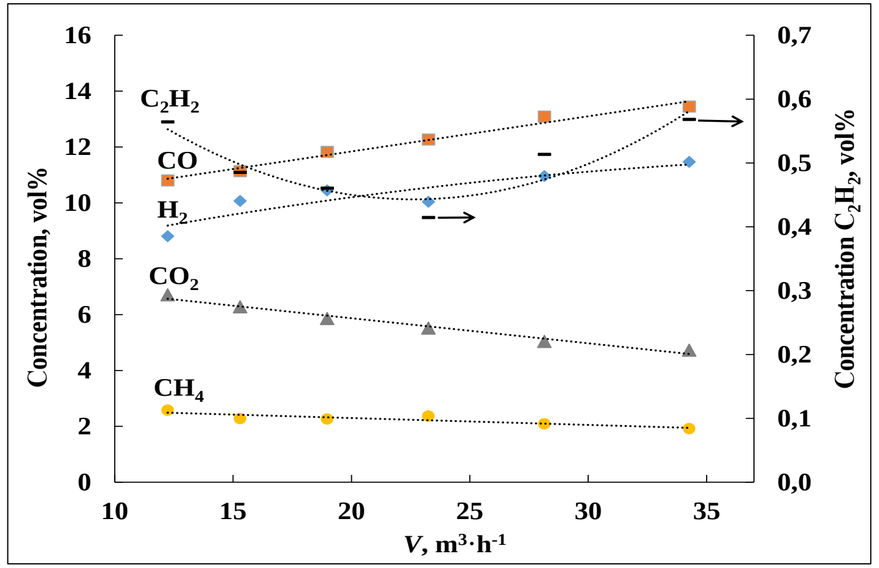
MATRIX CONVERSION OF PROPANE-BUTANE MIXTURE TO SYNGAS

Matrix conversion of hydrocarbons is based on the flameless surface combustion of fuel-rich mixtures near the surface of gaspenetrable matrices. It can be one of the most effective method of processing of associated petroleum gas (APG) to syngas. APG is rich in propane and butane, most of which is flared. In this work were carried out experimental tests of the matrix conversion of propane-butane mixture using air as an oxidizer. The aim of this work was to assess the impact of C_2 + hydrocarbons included in APG on matrix conversion on a pilot scale. The study was conducted under different values of the main process parameters: the initial ratio of fuel and oxidizer, the pressure inside the converter and the flow rate of the initial mixture.

General arrangement of matrix reformer for propane-butane mixture conversion into syngas



Product concentrations as functions of и $O_2/\Sigma C$ in oxidation with air at a gas-air mixture flow rate of 11.55 – 13.00 m^3 h^{-1}



Product concentrations as functions of flow rate mixture of propane-butane mixture with air at $O_2/\Sigma C = 0.8$

It was shown, that matrix conversion hydrocarbons C_2+ is highly productive and energy efficient method for processing associated petroleum gas to syngas. Synthesis gas has been obtained with a hydrogen content of 11.5%vol, CO-13.5%vol, and CO_2-4.7%vol with a specific fuel mixture consumption of 10 l/h per 1 cm^2 of the matrix surface and $O_2/\Sigma C$ ratio = 0.8.

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