

Synthesis of Products from Dry Stripped Gas, Obtained During the Processing of Associated Petroleum Gas

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Abstract

Oil, natural gas, and also products of their processing make a basis of a fuel and energy complex of Russia and define economic development of other branches and the country as a whole. The main raw materials are: natural and associated hydrocarbon gases; gaseous and liquid petroleum products; synthesis gas ($\text{CO} + \text{H}_2$); coke oven gas and industrial resins produced by thermal processing of wood, coal, shale, peat.

The main products of gas processing plants are: dry stripped gas, a wide fraction of light hydrocarbons, natural stable gas. Each fraction represents the possibility of producing hydrocarbons with specified properties. A wide fraction of light hydrocarbons is a raw material for the production of liquefied gas and for chemical processing.

At gas fractionation plants in column-type devices, due to the difference in the boiling points of the products, is carried out a separation by rectification method of wide fraction into the fractions of individual hydrocarbons: propane, butane, isobutane, pentane, iso-pentane, hexane and natural stable gas.

Natural stable gas in the future can be upgraded and recycled. Dry stripped gas can be supplied to the gas pipeline for domestic use. However, it can also be used to produce synthesis gas $\text{CO} + \text{H}_2$, methyl alcohol, ammonia and other products.

In our work we consider the reactions of the process of urea synthesis ($\text{CO}(\text{NH}_2)_2$), the main stages of caprolactam synthesis ($\text{C}_5\text{H}_{10}\text{CONH}$) diaphene (4-isopropylaminodiphenylamine), sulfenamide (N-cyclohexyl-2-benzothiazole sulfenamide) - products of secondary processing of associated petroleum gas on Russian enterprises of petrochemical complex.

There are also presented technological block diagrams of modernized plants allowing to produce own raw materials (benzene, nitrogen, hydrogen, CO_2 , synthesis gas) for synthesis and production of goods for industry (polymers, polymer modifiers) and agriculture (fertilizers). It should be noted that these products are obtained on the basis of dry stripped gas - the first fraction of processing associated petroleum gas.