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# CONDUCTING RESEARCH ON PRODUCTION OF LIQUEFIED HYDROCARBONS FROM PETROLEUM GASES

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**Annotation**
The composition of associated gas differs greatly from each other when studied in the context of fields and depends on the type of fields and development conditions, i-liquefied gases are obtained not only from satellite gases, but also from gas condensate fields.

**Keywords:** associated gas, methane, ethane and partially propane, butane, isobutane, condensate.

## INTRODUCTION

When oil is stabilized, light hydrocarbons - satellite gases - are released from its composition. Associated gas is the most expensive raw material for the production of liquefied petroleum gas.

Oil from the well enters the separator along with oily gas. The greasy gas in the oil is separated and discharged through the nozzle above, and the oil is directed to the reservoir through the nozzle in the middle. The petroleum gas is directed through a gas separator to the processing plant, where the slightly compressed gases are separated by an absorption method. Then the compressed gas is separated from the absorbents and fed to a separator for separation of individual hydrocarbons into fractions.

In addition to separating liquefied gas from associated gas by absorption, it is also separated using low temperature technology. When processing associated gases at gas processing plants from dry gas and its composition, methane, ethane and partially propane, ethane fractions and liquefied gases: propane, butane, isobutane and components of autobenzene-stable gaseous gasoline are obtained.

Below are data comparing the associated composition of gas from oil fields with natural gas from gas and gas condensate fields (Table 1).

The composition of associated gas differs greatly from each other when studied in the context of fields and depends on the type of fields and development conditions, i-liquefied gases are obtained not only from satellite gases, but also from gas condensate fields. When processing gases at gas condensate fields under high pressure (100-600 kgf / $cm^2$), some oil components turn into liquid. When the pressure value drops to 40-80 kgf / $cm^2$, condensate is released from the gas as a result of condensation. This condensate contains a heavy hydrocarbon component of gasoline and liquefied gases.

It is known from the oil preparation process that when the oil rises in the elevators, part of the auxiliary gas remains in the oil in liquid form. The amount of dissolved gas and its composition depend on the mode, pressure and temperature of the elevator.

The gases contained in the oil are sent to the oilfield plants for re-stabilization, and the remaining methane and butane fractions are additionally recovered. More than half of the liquefied petroleum gas is produced during processing at oil refineries. The composition of the gas obtained as a result of oil refining at the refinery will have the following classification for each process (Table 1).

During thermal cracking, a large amount of oliphenes is obtained. The catalytic process produces large amounts of isobutanes, while the pyrolysis process produces large amounts of ethylene and hydrogen.

The gas fractionation apparatus includes gas, propane-propylene, butane-butylene fractions of gas components extracted from plants from oil.

Consequently, the composition of the LPG depends on the production method. Satellite gases contain boundary hydrocarbons (propane-butane) when processed at gas processing plants, and in the latter case, contain a small amount of boundary hydrocarbons (propane-butane).

Table 1 The average composition of satellite gases in several fields was compared with data from gas and gas condensate fields.

| № | A place | Depth of field | Component depth | | | | | | | | condensates | Relative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $CH_4$ | $C_2H_6$ | $C_3H_8$ | $C_4H_{10}$ | $C_5$+ High | $CO_2$ | $H_2$+ inert gases | $H_2S$ | | |
| **I.** Gas condensate fields | | | | | | | | | | | | |
| 1. | Утабулок | 2185 | 88,0 | 1,4 | 0,37 | 0,15 | 0,21 | 4,7 | 0,1 | 4,9 | 11,6 | |
| 2 | Зеварда | 2610 | 90 | 4,5 | | | | | | 0,09 | 78,8 | |
| 3 | Шутан | 3100 | 89,0 | 4,1 | 0,93 | 0,37 | 1,03 | 2,72 | 0,72 | 0,08 | 58 | |
| 4 | Одамгош | 1750 | 78,8 | 8,1 | 3,7 | 1,9 | 3,4 | 1,8 | 2,2 | 0,28 | 163 | |
| 5 | Газли | 97,2 | 0,32 | 0,9 | 0,47 | 0,13 | 2,3279 | - | « | « | « | |
| **II.** Oil condensate fields | | | | | | | | | | | | |
| 6 | Южный Кемачи | 2600 | 81,5 | 10,31 | 3,26 | 0,73 | 16 | 3,25 | 0,56 | 0,04 | 43 | |
| 7 | Умид | 2600 | 90.87 | 3.62 | 0.85 | 0.32 | 0.52 | 3.2 | 0.55 | 0.07 | 56 | |
| **III.** Oil fields | | | | | | | | | | | | |
| 8 | Северный Утабулок | 4300 | 88.0 | 3.910 | 0.91 | 0.6 | 2.327 | 3.38 | 0.7 | 0.04 | 78 | - |
| 9 | Южный Тошли | 1100 | 59.9 | 18.1 | 10.53 | 4.95 | 3.58 | 1.22 | 2.2 | - | - | - |
| 10 | Кукдумолок | 2950 | 78.31 | 5.0 | 1.97 | 0.73 | 9.48 | 3.7 | 0.37 | 0.08 | 600 | |
| 11 | Крук | 2160 | 84.58 | 5.96 | 1.18 | 0.24 | 0.396 | 2.48 | 0.17 | 0.13 | 73 | |

When processing associated gases at gas processing plants from dry gas and its composition, methane, ethane and partially propane, ethane fractions and liquefied gases: propane, butane, isobutane and components of autobenzene-stable gaseous gasoline are obtained.

The amount of dissolved gas and its composition depends on the operating mode of the elevator, depends on pressure and temperature. More than half of the liquefied petroleum gas is produced during processing at oil refineries.

The composition of gas obtained during processing at the Fergana refinery will have the following classification for each process (Table 2).

This technology is simple and inexpensive. The separation of $C_3$ + fractions increases with increasing pressure difference between the inlet and outlet gases.

The disadvantages of this device are the contamination of products with methanol and the complexity of the disposal of methanol water. This scheme differs from the previous one in that when drying products, the gas is dried using solid dryers and does not contain methanol (Fig.1).

Table 2 Obtained on the basis of various technologies in the process of oil refining. liquefied gas content in% by mass

| Components | Thermic cracking | | Catalytic cracking | | Contact coking | | Catalytic reforming | Gasoil and catalytic pyrolysis |
|---|---|---|---|---|---|---|---|---|
| | Blend of tar and gas oil | Fuel oil | Heavy raw materials | Light raw materials | No destruction | With destruction | | |
| $H_2$ | 0,4 | 0,2 | 1,69 | 1,4 | 0,275 | 1,78 | 10,8 | 3,4 |
| $CH_4$ | 14,5 | 2,8 | 8,2 | 2,8 | 20,0 | 29 | 3,66 | 49,70 |
| $C_2H_4$ | 1,9 | 3,3 | 2,52 | 1,2 | 8,0 | 7,1 | - | 23,0 |
| $C_2H_6$ | 19,8 | 3,7 | 8,4 | 4,6 | 15,0 | 16,3 | 12,4 | 19,20 |
| $C_3H_6$ | 9,7 | 4,7 | 16,90 | 8,4 | 8,7 | 11,1 | - | 2,56 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $C_3H_6$ | 7,7 | 13,0 | 15,10 | 20,0 | 12,05 | 16,7 | 27,90 | 1,28 |
| $C_3H_8$ | 1,9 | 15,5 | 2,52 | 9,1 | 3,3 | 1,3 | - | 0,425 |
| $i-C_4H_8$ | 7,5 | - | 14,3 | - | 9,68 | 5,78 | - | - |
| $i-C_4H_{10}$ | 42,2 | 42,2 | 21,0 | 36,0 | 3,12 | 4,02 | 22,5 | 0,425 |
| $C_4H_{10}$ | 14,5 | 14,5 | 9,3 | 16,5 | 6,98 | 6,30 | 225 | - |

Production of liquefied petroleum gases at refineries. According to this technological scheme, it is planned to modernize the Fergana refinery and supply high-quality fuel products today.
The crude oil refining process begins with fraction distillation and this technology differs from one plant to another. Oil is first heated in a tubular furnace, then soluble fractions of fuel oil and bitumen are separated from it, which are pumped for further separation into fractions (Fig. 1).

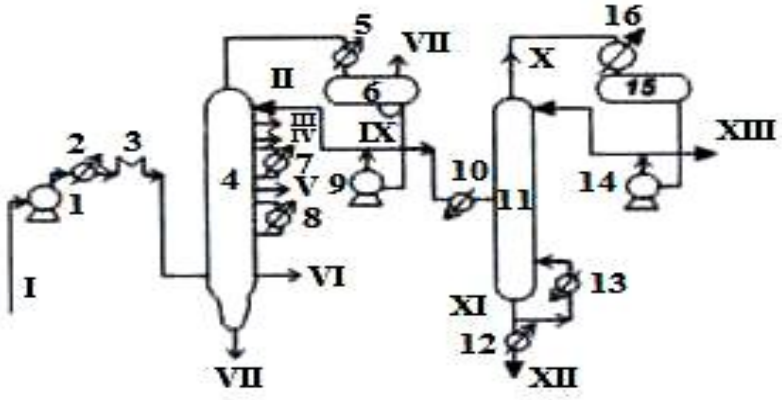


Figure 1. Simplified scheme of utilization of liquefied petroleum gas:
1,9,14- pumps; 2,5,7,8,10,12,13,16- heat exchangers; 3- oven; 4- pipe still; 5 top condenser; 14 debutanizer; 15- distillation manifold; I- raw oil; II reverse product direction; III, IX- heavy and light distillate; IV- kerosene; V, VI - light and heavy gas oil; VII- dry gas; X, XI, respectively C1 and C5; XII- light primary distillate; XIII- Liquefied oil refining direction.

## CONCLUSION

Thus, it is necessary to start work on the production of high-quality synthetic motor fuel using satellite flare gases, oily natural gas from gas condensate fields, stabilized oil and refined petroleum gases as the main source of liquefied petroleum gas production.

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