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BASIC PROPERTIES AND COMPOSITION OF NATURAL GAS

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ABSTRACT:

This article is about the physical and chemical properties of natural gas and its importance in use.

KEYWORDS: natural gas, SO2, N2, O2 SN4, mud, water, oxygen, lamps, igniters, furnaces.

INTRODUCTION:

Natural gas is a set of gas components that occur in different situations. T. g. Depending on their natural state, they are classified as follows: atmospheric gases (chemical, biochemical, radiogenic mixtures of gases); crustal gases (peat gases in the soil, subsoil, mud and biogenically formed SO2, N2, O2 SN4 with a mixture of SO, NH3, H2 and others); sedimentary gases (oil and coal gases, chemically formed mixed gases: SN4, N2, SO2, a mixture of SN4 with N2 and other gases); sea and ocean gases (biochemical, chemical and radiogenic gases: a mixture of SO2, N2 with N2 O2, NH3 and others); gases of metamorphic rocks (chemically formed gases: a mixture of SO2, N2 with N2, H2S, SO2, etc.); volcanic gases (chemically formed gases: a mixture of SO2, N2, SiO2, HCL, HF with N2, CO, NH3, etc.); cosmic gases (relic gases, gases released from the atmosphere of the outer layers of stars or gases released in a new and very new explosion: with N2, Ne, ionized hydrogen, SO compounds, SN, ON radicals); (see also flammable natural gases).Gases are one of the states of matter. Each substance is in solid, liquid, and gaseous state with changes in temperature and pressure. Mac, water can be solid (ice), liquid (water) or gas (vapor). G. molecules are compact, mobile, and very small in density, mixing rapidly with each other. G. occupies the entire volume of the vessel in the absence of external influences. The gravitational force between G. molecules is much smaller than that of solid and liquid body molecules. Under normal conditions (temperature 273, 15K and pressure 1.01 105 Pa), the density of G. is 1000 times less than the density of liquids, or the distance between gas molecules is 10 times greater than that of liquids. However, under normal conditions, 1 cm3 of gas contains 310 molecules. G. is represented by three quantities: pressure (r), volume (V), and temperature (T). The variations in T magnitudes are interrelated. These phenomena are the result of the constant chaotic motion of molecules and their collisions with each other. Under normal conditions, a gas does not conduct electricity by itself, but this property of the gas changes with changes in pressure and temperature. Each real gas turns into a liquid when cooled to a specific critical temperature (Tk). For example, for water Tk = 374.2 ° K, then water is in the vapor state, for oxygen TK = 91.14 ° K, then it is in the gaseous state, and so on. All types of gas are also energy controllers of the material world, because the oxygen-nitrogen gas mixture burns fuels (complexes of internal energy) in various fields or in nature in general (volcanic activity, large forest fires, etc.) to some extent controls the current energy state of the planet. . The unique oxidation and oxidation properties of gas, combustion and combustion, explosion and explosion are used in our lives, in the national economy, in technology and in the implementation of large-scale projects. Gas lamps, lamps, igniters, furnaces, welders, luminaires, turbines, heaters, motors, condensers, refrigerators, openers, turbine power plants, turbine cars, locomotive turbines, lasers, and others define the essence of development. In addition to the above-mentioned non-gaseous oil refining, natural combustible gas (methane, ethane, propane, butane) is widely used in practice. The composition of the gas formed by the rapid cracking of the oil depends on the type of oil obtained, and in the case of deep chemical refining, the methods and conditions of the process. This gas is widely used in industry as a semi-finished product or monomer in organic and petrochemical synthesis. The Kokdumalak oil and gas condensate-gas field is being tested in the country. It contains G. methane - 89%, ethane - 0.3%, propane - 0.2%, butanes - 0.6%, G. condensate - 6-7% and other G. (N_2, CO_2, H_2S) - 1.2%. G. widely used in industry (see Gas industry).Non-carbon dioxide in natural gases can be nitrogen (N_2), carbon monoxide ($C0_2$), carbon sulfide (H_2S), inert gases such as argon Ar, helium He, krypton Kr, xinon Xe, mercaptans (R5H). The methane gas homologues that make up natural gas range from C4 to C41. That is, methane-CH_4, ethane-C_2H_6, propane-C_3H_8, butane-C_4H_{10}. This means that C5 to C9 are liquids, C10-C20 are dark and above C20 are solids. The lightest liquid in natural gas, carbon dioxide, can also be found in solution. These range from C5 to C9 and are called capacitors. Natural gas fields containing molten condensers are called gas condensate fields. Natural gas is classified according to the source from which it is extracted and the amount of components it contains:

l. Natural gases from pure gas fields. These gases contain almost no carbon dioxide. These gases consist of dry, ie pure gases.

2. Satellite gases released along with oil. Satellite gas is a natural gas dissolved in oil, which is released during the movement of oil from the formation and the well to the surface. Therefore, dry gases, especially methane CH_4, ethane, propane, there are more carbonates like butane.

3. Natural gases from gas condensate fields. These gases consist of a mixture of dry gases and liquid condensates. The gases in all three groups are mainly consumed by the amount of methane + pentane (i.e. CH_4-C_5H_{12}) components. In fact, we can divide all the deposits into the following eight types.

4. This field is a pure gas field with a gas content of 100%. That is, Vr = l;

5. This field is an oil-framed gas field. The amount of natural gas is in the range of 75% to 100%, ie 0.75r

6. Such fields are called oil and gas fields. The amount of natural gas in such deposits includes the volume from half to% of the volume of the entire productive layer, ie 0.5r <0.75.

7. This field is a gaseous oil field. The amount of natural gas in such deposits can be above 25% and below 50%, i.e. 0.25r <0.5.8. These fields are called gas cap oil fields, and the amount of natural gas in such fields is very small or less than 25%, ie Vr <0.25.

9. Such fields are called pure oil fields, the whole part of the productive layer is occupied by oil, and that is, natural gas is completely destroyed.

10. Deposits of this type are called oil condensate fields. Natural gas, oil and condensates can be found in varying amounts in such fields.

11. These types of deposits are called gas condensate deposits. There are liquid hydrocarbons dissolved in gaseous hydrocarbons, ie liquid condensates dissolved in natural gas, which occupy the entire volume of the productive layer. Natural gases can be divided into the following classifications depending on the amount of components they contain:

1) According to the amount of methane (% by volume) Pastmethane 0-30
Low Methane 30-70 Medium Methane 70-90
High Methane 90-100

2) Heavy homologues by quantity C (% by volume)
Low 0-3; Low quantity 3-10; More than 30% of the average.
3) Nitrogen (Nr) by amount (% by volume) Low nitrogen 0-3;
Low nitrogen 3-10; CT average nitrogen 10-30; High nitrogen above 30%.
4) Carbonate IV oxide (CO2) by amount (% by volume) Low 0-3; Less than 3-10; an average of 10-30; High amount more than 30%.
5) By volume of hydrogen sulfide (H2S) by volume up to 0.001% without sulfur.

Low sulfur 0.001-0.3 Medium sulfur 0.3-1.0 High sulfur More than 1.The reason for such a detailed classification of natural gas is that the facilities for the production of natural gas in the field will vary depending on the amount of its components (condensate CO2) and the amount of substances such as H2S. Sulfur-free natural gas treatment facilities will not be built in sulfur-free and low-sulfur deposits. Basic physical properties of natural gases. The main physical properties of natural gas are used in the calculation of design parameters of fields, in the preparation of gases in accordance with state standards in the field and in mutual settlements between the gas processing plant and the gas transportation company. Therefore, it is necessary to constantly monitor the basic physical properties of natural gases. If the pressure, volume, and temperature of a gas change, so do its basic physical properties. This means that the basic physical properties of a gas depend on pressure, volume, and temperature, so the physical properties of the gas must be monitored regularly.

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