correlation with Ce and Y in intrusive rocks except microgranite indicates that monazite, bastnäsite, apatite and xenotime accessories are not only the better accumulators for the radioelements in El Sela area.

The mineralogical features show that zircon is the most abundant accessory mineral of intrusive rocks. Morphologically, zircon of two-mica granite is euhedral coarse-grained with zonation characterized by an internal zonal structure. Zircon in post-granitic dikes exhibits irregular forms with no zonation. Geochemically, ZrO_2 has higher values in the core whereas UO_2, ThO_2 and HfO_2 increase at the peripheries of crystals. Y_2O_3 may occur only at the crystal rim. Zircon displays significant covariation in UO_2, ThO_2 and HfO_2. In two-mica granite zircon contains the highest HfO_2, UO_2, ThO_2 and CaO contents, but the lowest value of Sc_2O_3. No detected HfO_2 or Y_2O_3 in zircon of microgranite or dolerite dikes, respectively. The principal LREE minerals are monazite, apatite and bastnäsite in the studied intrusive rocks whereas the latter one is recorded only in two-mica granite and bostonite. On the other hand, xenotime is one of the most enriched in HREE in the studied two mica granite. It has considerable amounts of HREE especially Dy (3.63–7.68 wt.%), Er (3.21–11.46 wt.%) and Yb (9.75–22.15 wt.%). On the other hand, the two-mica granite has the highest thorium content, owing to the formation of thorite, brockite, auerlite and uranothorite. While, the post-granitic dikes, especially microgranite and dolerite as well as jasper veins possess the highest uranium values, related to primary and secondary uranium minerals. Uraninite and coffinite are recorded in dolerite, but the latter is recorded in microgranite, bostonite and jasper. Pitchblende is recorded, for the first time, in jasper. Primary uranium minerals as uraninite, pitchblende and coffinite may be a source for uranium enrichment and formation of secondary uranium ore deposits.

Uranium mobilization was active towards the two perpendicular shear zones having NNW-SSE and ENE-WSW rejuvenated trends. Successive hydrothermal alterations play their role in uranium ore deposits to be trapped in post-granitic dikes and jasper veins. Minerals pyrite, chalcopyrite, sphalerite, arseno-pyrite, galena in addition to native Ni, Cu, Fe metals, silver and gold are associated with uraninite, pitchblende and coffinite. El Sela area is considered as a good example of intra-granitic vein-type polymetallic uranium ore deposits.

PROBLEMS OF OIL PRODUCTION BY MEANS OF GAS HYDRATES ON THE SHELF OF THE BARENTS SEA

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Next few years there will be the development of unique deposits of hydrocarbons on the Russian Arctic shelf covering an area of more than 6 million km^3. At the same time the largest resources of oil (more than 3 billion tons) are concentrated in the Barents Sea [3]. There are the most severe climatic conditions in the world, so there is a number of problems associated with permafrost bottom of the sea - "Submarine Cryolithic Zone". Possible formation of crystalline compounds of water and gas called "gas hydrates" is associated with this area. Gas hydrates are ice-like solids, in which guest molecules or atoms are trapped inside cages formed within a crystalline host framework (clathrate) of hydrogen-bonded watermolecules [1]. Outwardly, they look like ice or snow. Figure 1 shows a map of the Arctic Ocean in relation to the forecasts of gas hydrate accumulations [2].

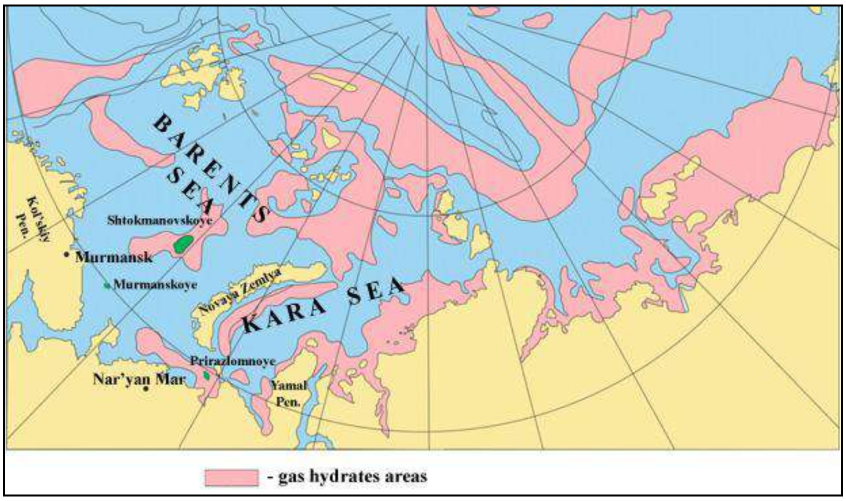

Fig.1. Map of gas hydrate accumulations

Unfortunately, the studies of gas hydrates in the Barents Sea are not classified and virtually have not been carried out yet.

The formation of gas hydrates occurs due to the negative impact of freezing temperatures and freezing of the bottom layer of water. There are anthropogenic and natural gas hydrates. Anthropogenic gas hydrates can be formed in oil production systems. They are deposited in the wellbore, thereby greatly reducing its bandwidth. This reduces the well production and can cause an emergency stop of its operation. Natural gas hydrates can form clusters of gas hydrate deposits around the production casing. With the rise of warm oil from the lower horizons the temperature of the surrounding rocks increases. This leads to a change in the phase state of water and gas in hydrate intervals around the wells. This process is similar to "thawing" of frozen ground in the development of hydrocarbon deposits in permafrost regions [3] and leads to severe accidents: casing collapse, gas breakthrough of the conductor during the gas showings, gryphon formation and wellhead failure [5].

As this problem has a significant impact on oil production, gas and gas condensates it needs to be solved. There are several basic methods of fighting with gas hydrates:

- Injection of hot water or brine;
- Passive thermal insulation technique;
- Active thermal insulation technique;
- Increase of down hole temperature;
- Electromagnetic heating
- Use of inhibitors;

The most direct method of thermal stimulation is the injection of hot water or brine into the hydrate formation. However, this method has numerous drawbacks, such as significant heat loss during delivery of hot fluid from the ground/ocean surface to the hydrate formation, which is ineffective to be used as the main strategy of thermal stimulation [4]. This limitation has led interest in developing alternative methods of thermal stimulation.

Heat insulation method of the wellbore is intended for fighting with "thawing" of natural gas hydrates. Extend the term "thawing" can be, if you use passive insulation of columns. Passive thermal protection can be presented by filling of space between lift pipes and an operational column in the range of a hydrate intervals with noble gas or installation of pipes with the under heat transfer coefficient..

However, considering that mining lasts decades - it isn't rather reliable. Calculations show need of the active isolation. For these purposes it is possible to use a natural or forced circulation of cold ocean water in the intertubular hole annulus [9].

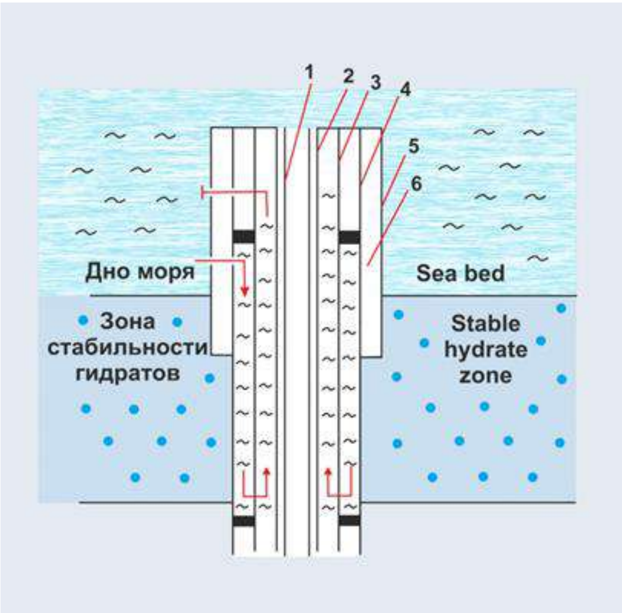

Fig. 2 Circulating scheme of isolation of trunks of wells [7]: 1– oil well tubing 2 – pay string; 3 – intermediate string; 4 – surface casing string; 5 – water blocking; 6 – cement

Others methods are aimed at increasing the temperature in the wellbore, thus preventing the formation of anthropogenic gas hydrate. The temperature increases with heating different "bottom-hole heaters". Currently, these methods are still in the industrial testing and do not guarantee complete elimination of gas hydrates formation.

The idea of electromagnetic heating of in situ methane hydrates was proposed by Islam in 1994 [8]. By introducing an electromagnetic heating source downhole, heat losses due to transmission through the well tubing can be avoided. This technique has already been applied in heavy oil extraction and could possibly be used for hydrate dissociation. Early numerical simulations concluded that energy efficiency could be increased greatly as compared to hot water injection [11].

The most common and effective method is the use of different inhibitors. This method is applicable both to prevent gas hydrates formation and remove already formed ones. The essence of this method consists in introduction of substances that prevent hydrate formation at the bottom hole [10]. Ethanol, methanol, diethylene glycol (DEG), triethylene glycol (TEG) and calcium chloride are used as inhibitors [6].

In recent years, interest in the issue of gas hydrates throughout the world has increased significantly. The growth of research activity is explained by the active development of hydrocarbon deposits on the Arctic shelf, in particular in the Barents Sea [7]. Research of the environmentally-friendly and cost-effective production of hydrocarbons on the shelf in this area is extremely important for the companies all over the world.

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SEMI-EMPIRICL THEORY OF TURBULENT TRANSPORT IN THE ATMOSPHERE

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Since the problem of air pollution appeared in many industrial areas of the countries, many scientists are working on the study of the movement of emissions in the atmosphere. Recently, as the development of technology and technology has become a real large-scale field experiments with registration of the whole complex of parameters, such as: impurity concentration, meteorological parameters these projects can provide more accurate information on the migration of impurities. Into the present time becomes possible the so-called numerical simulation of impurities with the necessary accuracy on computers. The validity of such models is possible by adjusting the parameters during the comparison results of calculation with the final results of the experiments.

Diffusion is one of the most important factors determining the behavior of heavy gas emissions in atmospheres. It was noted that migration processes are mainly turbulent in nature and the coefficients transportations are caused by the turbulent motion of the masses. Here will be described the simplest models of movement impurities in the atmosphere that take into account diffusion, and provides analytical solutions that carry qualitative character [2].

Suppose that the specific content of the impurity – $s(x,y,z,t)$, moving together with the air flow in the atmosphere. We define the solution of the problem with the surface S in the cylindrical region G, which consists of the lower base $\sum_0$ (at z = 0), the lateral surface of the cylinder $\sum$ and the upper base $\sum_0$ (at z = H).

If $\vec{\upsilon} = \upsilon_x \vec{i} + \upsilon_y \vec{j} + \upsilon_z \vec{k}$ (where i, j, k are unit vectors in the direction of x,y,z axes, respectively) – vector the velocities of the air particles as a function of $x,y,z,t,$ then , hence, the transport of the substance along the particle trajectory air with preservation of its contents will be presented in the form of the following equation

$$\frac{\partial s}{\partial t} + div(\vec{\upsilon} s) = 0, \tag{1}$$

To equation (1) we add the initial data

$$s = s_0 \text{ at } t = 0, \tag{2}$$

And conditions on the boundary S of the region G

$$s = s_s \text{ on s}, \tag{3}$$

where s_0 and s_s are given function.

Equation (1) can be generalized. If, in the process of distribution, the proportion of the substance reacts with the process is interpreted as the absorption of the substance by the external environment or disintegrates. That equation (1) goes to the following: