The working experience on standard samples of carbonate rocks produced the most successful results. Cracks, cavities, pores, inclusion of calcite were found in samples. During the research the cavities matches which were defined earlier in the full-size samples were recorded. The cavities are sufficiently large - diameter in the range of 3 mm. In some samples of the cavity are connected by channels and they occupy a fairly large amount. The cavern average porosity is about 15%. The cracks are considerably smaller than cavities, their disclosure of an average is about 1 mm. Fracture average porosity is about 5%.

In other types of samples pores were recorded. The size of the pores is large, rounded in shape, open. The reservoir of this type is of high porosity of 20 to 30%. Radiopaque inclusions of calcite were found. Minerals and organic remains of gastropods shells were also found. The method of exploration allows us to compare the effects of carbonate rocks using to hydrochloric "before and after". The result is shown quite clearly and numerically confirmed. Channels in the samples are significantly increased and in some cases, they are connected. New channels and porosity are also increased.

Study of salt rocks

The investigation of sylvinite VKMKS cubic shape samples until exposure to compressive load after initial loading, and then after the repeated load corresponding limit compressive strength of the sample were examined. The loading of the samples was carried out on the "hard" electromechanical press. The result is not only the numerical values of the volume, but also the representation of cracks and the sample itself , as well as models give an idea of the spatial distribution of cracks. The program also allows to reflect on the screen the dimensions of the cracks. According to this, he width of cracks were increasing every time, for example, in one of the samples in the first time the width cracking was 0,01-0,1mm; 0,19-0,5mm was at second time; the third it was 0,26-1,4 mm.

The main advantages of tomography:

1. Researching without the sample destroying.
2. Reducing the terms of research
3. Reducing the cost of research
4. Reducing the technological and financial risks by reducing uncertainty, as well as improve the reliability and detail of the information received.
5. Ability to conduct experiments unrealizable in the physics laboratory, including extreme temperature and pressure conditions.
6. Ability to conduct a series of multivariate numerical experiments on one sample (with a limited set of physical samples).

Conclusion

X-ray tomography core is a very perspective method of petrophysical properties of rocks studying. The method allows to solve a great variety of basic and fundamental geological problems. We can fully visualize the rock in a 3D image and analyze all its properties. It is possible to highlight cracks, pores, cavities, inclusions, and heterogeneity, different layers of rock density and differentiation. X-ray tomography allows us to investigate samples of various sizes, and not only a reservoir samples, it allow to study all the rocks. Using the method helps us to be competitive in the world of high technology.

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HISTORY OF OIL INDUSTRY IN RUSSIA

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In Russia, oil was first mentioned in 16th century. Travelers described how tribes living near the shores of the river Ukhta in northern Timan-Pechora region, collected oil from the surface of the river and used it as medicine, oil and grease. Oil collected from the river Ukhta, was first brought to Moscow in 1597.

In 1745 Fedor Pryadunov received permission to start oil production from the bottom of the river Ukhta. Pryadunov also constructed a primitive refinery and was supplying some products to Moscow and St. Petersburg.

Oil was also observed by numerous travelers in the North Caucasus. Local residents even collected oil with buckets, scooping it out of wells up to five feet. In 1823, the brothers Dubinins opened the refinery in Mozdok for oil collected from the nearby Vozneseskiy oilfield.

Birth of oil industry in Russia

In the Baku region, there were many large fields with relatively easy recoverable reserves, but the transportation of oil to markets was difficult and expensive.

Nobel brothers and the Rothschild family played a key role in the development of the oil industry in Baku, which was the part of the Russian Empire. Industry developed rapidly, and at the turn of the century, Russia accounted for over 30% of world oil production. Shell Transport and Trading, which later became part of the Royal Dutch / Shell, started its business with the transportation of oil produced by the Rothschilds, in Western Europe.

Four years later, the first oil well was drilled by the river Ukhta, and in 1876 the commercial production of oil began at the Cheleken peninsula on the territory of modern Turkmenistan. The rapid growth of oil production was accompanied by the construction of various plants for processing of crude oil and also the opening of the plant for the production of oil in the region of Yaroslavl in 1879 and a similar plant in the same year in Nizhny Novgorod.

The Revolution of 1917 had a negative effect on oil production in Russia, the situation deteriorated further with the nationalization of oil fields in 1920. Nobel brothers sold a significant portion of its Russian assets of the company Standard Oil of New Jersey, which later evolved into a company Exxon.

Standard Oil was against the decision to nationalize oil fields and refused to cooperate with the new Soviet government. But other companies, including Vacuum and Standard Oil of New York, which later evolved into the company Mobil, invested in Russia. The continuing influx of foreign capital helped restore oil production in Russia, and in 1923 the export of oil returned to the pre-revolutionary level.

3. Growth of the Soviet oil industry

From the 1950s production from new fields was approximately 45% of the total production of the Soviet Union. Large-scale investment in the region quickly pays for itself, which contributed to a serious increase in oil production in the USSR. Additional tons of oil were to meet the needs of new plants, which were built in the period from the 1930s to the 1950s. Omsk plant was opened in 1955 and subsequently became one of the largest refineries in the world.

In the early 1960s, the Soviet Union has replaced Venezuela with the second largest oil producer in the world. The release of large amounts of cheap Soviet oil on the market has forced many Western oil companies to lower prices for crude oil produced in the Middle East, thus reducing the payments for subsoil governments of the Middle East.

In the early 1960s first reserves in Western Siberia were explored, the most important of which was opened in 1965 deposit - supergiant Samotlor with recoverable reserves of about 14 billion barrels (2 billion tons).

West Siberian Basin is characterized by complex natural and climatic condition for oil production, and a huge area stretching from the permafrost in the Arctic Circle to the impenetrable peat bogs in the south. But despite all these difficulties, the Soviet Union was able to increase production in the region with astronomical speed.

Decline in Soviet oil industry

After achieving phenomenal production from fields of the West Siberian basin, Soviet oil industry has begun to show signs of decline. West Siberian fields were relatively cheap to develop and gave a significant gain at the expense of their size, and the Soviet planners gave priority to maximize short-term rather than long-term recovery.

In addition, very few people worked to increase the efficiency of investment in the development and introduction of new technologies. Problems began to appear in the fall of productivity, low reservoir pressure and increasing water cut.

In 1988, the Soviet Union reached a new record production level of 11.4 million barrels per day. At that time, the country was the largest oil producer in the world with a production capacity substantially higher than in the US and Saudi Arabia. In the same year the level of production in Western Siberia has reached 8.3 million barrels per day .

But from that moment a significant decline was impossible to avoid due to poor technology of production management, despite the sharp rise in capital investments, the Soviet Union could not keep production from failing until the beginning of 1990. But then came a dip in production, which was as sharp as its growth - the level of production in Russia fell steadily throughout the decade and stood at a level of almost half the initial peak.

The drop was exacerbated by the economic crisis that has gripped the region during the collapse of the Soviet Union. The collapse of the economy has caused a sharp drop in oil demand in the country, and export capacity remained limited, and therefore the company was forced to continue to sell a larger share of oil in the domestic market, often to non-creditworthy consumers.

Financial difficulties of companies have provoked a sharp decline in new exploration, drilling volumes and even the volume of capital repairs of existing wells. As a result, this situation led to further fall of production.

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