O4-5 COMPLEX GEOLOGICAL- GEOPHYSICAL STUDY OF THE PETROLEUM-BEARING CARBONATE RESERVOIR

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Results of complex geological-geophysical studying of Lower Carboniferous carbonaceous rock of Dnieper-Donets Depression are described. Results obtained are the basis for of the forecast and discovery of the new oil-gas-bearing carbonaceous fields.

Dnieper-Donets Depression (DDD) or paleorift is the main petroleum-bearing province of Ukraine. More than 180 petroleum fields are discovered in the sedimentary cover and DDD gives about 90% of total Ukrainian oil and gas output.

Dnieper-Donets paleorift is the component of Pripyat- Dnieper-Donets megarift which is a part of Sarmat-Turan lineament. This megarift is situated on East- European platform between the Voronezh anteclide and Ukrainian shield and extends from Polesiye Region to the Caspian Sea.

Stratigraphical range of petroleum presence is rather large in DDD. It embraces the sediments from Devonian to Jurassic inclusive.

A main petroleum prospects in DDD are connected with a search of non-anticline traps in Devonian and Caboniferous terrigenous (most deltaic facies) and carbonaceous sedimants.Significant resources of oil and gas are concentrated only in carbonaceous rocks of Tournaissian and Visean ages.

Chain of reef-bioherm massifs arisen along the extended Tournaisian-Visean carbonaceous shelf. These massifs are recognised with using of seismic and drilling data. These massifs occur in DDD at depth 3-5,5 km. They have the average thickness 90-125 m. The largest reefs have a cyclic structure, thickness up to 300 m and length 2-3 km.

Oil influxes from organogenic rock reach 300m^3/daily and gas ones attain to 1300 thousands m^3/daily.

Methods

Carbonaceous organogenic bodies are studied with a complex of geophysical (interpretation of logging data) geological (well to well correlation, detailed samples description), seismic and petrophysical methods. Special methods of the seismic data processing (method-PAL) were appreciated for of the new perspective carbonate reservoirs. Pseudo-acustic Logging (PAL) Technique allows converting an ordinary reflectors-patternedtime section into dynamic section of layer with different physical data. Geological interpratation of such section allow to trace details of oil and gas reservoirs of 20-3- m thick from well at the depth of 3-5 km and make suggestion for genesis of carbonate bodies and recognise morphology and type of the trap (G:B. Sergyi, 97).

To the determinations of the petrophysical parameters (such as porosity, permeabilityand hydrocarbon saturation) were devoted a special attentian. Data base has been developed for reservoir properties of carbonaceous rocks (L.A. Lovovaya, 98).

Seismic-geological and litological-petrophysical models of reservoirs have been created from some large petroleum-bearing objects such as Kampanskyi reef, Matchekha and Selyukhovka bioherms.

Conclusions

The results of the petrophysical investigation, seismic-geological and facial- lithological modelling allow to carry out prediction of reef-bioherm reservoirs with high properties and the new oil-bearing corbonate fields on the territory of the Dnieper-Doneets basin.

The methods such as above could be consequence for the search and discovery of the new carbonaceous traps (or reservoir) in others regions of the World.