

Generalization of the results of combined petrophysical PT-studies of a core of the Krivoy Rog ultradeep borehole (Ukraine) and their possible geophysical applications

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Information about results of studies of thermobaric changes of physical properties of rocks discovered in drilling the Krivoy Rog ultradeep borehole (Ukraine) are summarized. Petrophysical models of the Earth's crust of the area of its location are set up.

The main tasks of drilling this borehole located in an iron province which is one of the largest in the world were to elucidate the formation conditions, composition, properties and evolution of the Earth's crust of continental type within the area of the development of precambrian iron-silicon and granite-greenstone formations of the Central Ukrainian Shield. Also specified was the interpretation of anomalies of the observed geophysical fields and the nature of seismic boundaries in crust.

For this purpose and to set up a regional petrophysical model of the interior we have obtained a new unique information on PT-changes of physical characteristics of rocks discovered by the borehole.

The method worked out earlier in which specialized chambers are used was applied in a set of laboratory petrophysical PT-experiments on samples of a representative collection of cores. We carefully studied elastic, thermal, electrical and magnetic parameters of rocks in characteristic strictly oriented structural and textural with simulating respective deep thermobaric conditions in PT-experiments. We are founding the nature of the anisotropy of the distribution of the studied petrophysical parameters.

An analysis of the results of the whole set of petrophysical PT-experiments and the geologic-geophysical information enabled us to assume possible changes of properties, composition and state of rocks at depth so far not reached by drilling. We have also set up prognosed deep petrovelocity, geoelectrical and lithological models of the Earth's crust of the area of the Krivoy Rog over- and underthrust structure.

I sincerely thank all my researchers that participated in the investigations.