

Petrophysics of Maykop series rocks of Ukrainian sector of Black Sea shelf

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For today in the field of data processing and interpretation of well-logging data with the computer systems using there is a change of old paradigm: «procedures of task decision are primary is information for a decision the secondary» on a new paradigm «knowledge are primary – procedures of tasks decision are secondary». Such change of paradigms leads to that in place of tasks of procedures programming there appears a task of necessary knowledge description in a problem area, to formalization of them and data entry in a computer with the purpose of the proper programs synthesis, that encouraged development of the interpretations systems of geophysical explorations based on expert systems. Within the framework of a new paradigm formulated conception of expert system construction for the aims of information interpretation.

General strategy of expert system construction is considered for the aims of well-logging data interpretation, and also possible strategies of consultations leadthrough within the limits of expert system and accordingly, meaningful semantic reflections obtaining of results structure of interpretation. The offered expert estimations method of target parameter value on the basis of quantity maximization of the so-called target certainty factor, which is calculated rely on a priori expert estimations of certainty factors both for the well-logging data-ins and for operations which can be used in the interpretation process.

A general functional diagram is created between geologic-geophysical factors, variables, that they are linked, by constants, ultimate and intermediate goals of well-logging data interpretation, and on its basis programmatic blocks which will realize an expert system for well-logging data interpretation are built.

The necessity of complex reservoirs consideration is shown both at lithologic level, and at thin-layer level environments. Substantive scientific provisions and construction procedures of petrophysical models are formulated from data of petrophysical laboratory and geophysical downhole information.

Test approbation of the developed approaches and methods of well-logging data interpretation is conducted in the deposits of the Maykop series on the examples of hydrocarbons deposits within the limits of north-western and near-Kerchian shelf of the Black Sea and Sea of Azov aquatorium.

Reservoirs in the Maykop series belong to complex reservoirs, which connected with sharp anisotropic as a reservoir-rock on a microlevel, so with heterogeneity of reservoirs on a macrolevel.

Maykop deposits, without regard to general similarity, nevertheless have distinct petrophysical parameters and differs in functional significance and dependence structure between them, in accordance with geographical areas and stratum subsections.

The analysis of lithologic and facies features of rocks shows that Maykop complex deposits forming occurred mainly in shallow marine conditions on a alternation background of transgressions and regressions. Integrally deposits of the Maykop complex within the limits of Sea of Azov aquatorium and near-Kerchian shelf are more porous than the Maykop deposits are within the limits of north-western shelf. On lithologic composition and formation conditions sandy reservoir-rocks are divided into two types. Forming of the first type occurred in the shallow conditions of stagnant sedimentary basin with the certain role of the river systems and underflows, and forming second – at substantial predominance of marine conditions of sedimentation.

On the basis of the conducted researches certain of principle geologic-geophysical models for each reservoir type, the criteria of reservoir selection are formulated in the Maykop series.

Conducted complex systemic lithology-petrographical, petrophysical and geophysical researches make it possible to create geologic-petrophysical basis for prediction of complex reservoirs of the Maykopian series.