

MAGNETIC SUSCEPTIBILITY EXPERIMENTAL STUDY OF THE ROCKS FROM NORTH-WESTERN PART OF DNEPER-DONETS DEPRESSION

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Magnetic susceptibility χ of the sedimentary and effusive Devonian and Carbonian rocks from 8 bore-holes of north-western part of Dnieper-Donets depression was investigated. There are argillites, aleurolites, sandstones, limestones, anhydrites, salt, tuff breccias, tuff sandstones, marls, dolomitic limestones, basalts. The crystalline basement (Precambrian) is presented by gneisses and granite-gneisses from Stroyivska bore-hole (2976-3803m). Oil and gas perspectives are connected with Devonian deposits. Magnetic susceptibility values of the rocks vary in wide interval: from $5,4 \cdot 10^{-5}$ Si (Zorkivska) to $921 \cdot 10^{-5}$ Si (Borkivska) for argillites; from $7 \cdot 10^{-5}$ Si (Nizhynska) to $11450 \cdot 10^{-5}$ Si (Borkivska) for aleurolites; from $3,9 \cdot 10^{-5}$ Si to $207 \cdot 10^{-5}$ Si for limestones; about 0 (Zorkivska) for anhydrite; from $1,7 \cdot 10^{-5}$ Si (Guzhivska) to $11666 \cdot 10^{-5}$ Si (Borkivska) for sandstones. Tuff breccias are characterized by χ of only $13 \cdot 10^{-5}$ Si and $80 \cdot 10^{-5}$ Si. Magnetic susceptibility of basalt is high enough – $11110 \cdot 10^{-5}$ Si. Low values of magnetic susceptibility characterize gneisses (from $17 \cdot 10^{-5}$ Si to $51 \cdot 10^{-5}$ Si) and granite-gneiss (about $41 \cdot 10^{-5}$ Si). The temperature influence on magnetic susceptibility of the rocks was researched. We made a pair from each sample for laboratory experiments. One of them was saturated by gasoline during 1 month the other remained dry. Samples magnetic susceptibility in dependence on temperature with the purpose of accelerating any processes taking place in them was measured. Step of heating was 50°C (from 100°C to 350°C). Magnetic susceptibility was measured on the astatic magnetometer and on the magnetic susceptibility bridge. As a result graphs of absolute values of magnetic susceptibility in dependence on the temperature were received. After experiment we can confirm that only in a small number of gasoline-saturated samples magnetic susceptibility increase (argillites, aleurolites, tuff breccia, sandstone). Some samples displayed no changes of χ or changes are similar in dry and in gasoline-saturated samples. In some occasions we can see reduction of magnetic susceptibility values of gasoline-saturated samples. It seems that the cause of such conduction of magnetic susceptibility may depend on the initial composition of the rocks and Fe-contained minerals. It needs the supplementary magnetic-mineralogical investigations to solve this problem.

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