INVESTIGATION OF CAPILLARY EFFECTS IN THE OIL-ROCK SALT SYSTEM

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Some problems of capillary imbibition of fluids in low-porosity media are considered. Penetration of oil into rock salt samples differing in structure from different deposits is experimentally investigated. The height of oil rise in rock salt as a function of time is calculated on the basis of a capillary imbibition model for porous media. The comparison of the calculated and experimental data shows that the model is applicable for describing the movement of fluids through rock salt, but requires further development to account for the structural features of this medium. Based on the results obtained, propagation of oil in salt mass during the long-term operation of an underground oil storage is predicted.

In creating caverns in rock salt deposits the stress-strained state of the host rock changes, which causes the development of a high-permeability zone [9 - 11]. Besides, this zone shows a higher open porosity. There appears the risk that the product stored will escape outside the cavern and be lost in the porous-fissured space near the deposit outline zone.

The use of rock salt not only for oil and oil products storage, but also for disposal of wastes, including highly toxic and radioactive ones, calls for the assessment of the shielding (or reservoir) properties of the salt as an enclosing medium. To do this, data on the structure of the intergranular space, the average dimensions of “capillaries” and the range of propagation of fluids, in particular liquid hydrocarbons, *versus* time are required.

The penetration of fluids into the porous-fissured space of rock salt cannot but affect its physical and mechanical properties. As shown in [13], the presence of even brine traces at the boundaries of halite grains can reduce the resistance of salt to shearing strains.

All this supports the importance of the investigation of capillary effects in fluid-rock salt systems, which is what we have made in the present work.