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The properties of granular, fractured and cavernous reservoir rocks

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The data on reservoir properties were collected on deposits of Oil and Gas Industry of Kazakhstan, America, Central Asia, meeting the requirements of different types of pore spaces and forms of productive seam. Regularity of going beyond the usual properties of water and oil saturated industrial reservoir rocks and beyond water and oil pressures having diffusion permeability was detected. Statistical analysis of the laboratory data of collectors allowed to define the "slip" of the water saturation depending on the porosity, and the range of changes – on permeability in the direction of residual water growth. At the same two parameters, such as porosity and permeability of the samples, are natural identical values of the third one, for example, the residual water saturation that does not depend on the mineral composition of the collector skeleton [1].

At the base of the pallet in the lower left corner there are most dense rocks (materials) practically having no signs of porosity and permeability in which in the presence of nanopores there are fixed sealed water or other liquids. Only the diffusion migration of water molecules and light hydrocarbons is possible.

In the lower right corner in the reservoir rocks fracturing, on which maximum permeability values are created without matrix porosity and very low residual water, is developed and it fully meets the properties of pipeline in dense depths where non-industrial reserves of mineral fluids can be located.

In the upper right space of the pallet properties of the best reservoir are placed, and in the case of the porosity increasing to close to 1.0 value we get space where permeability is unlimited and stationary liquid is absent.

In the limit in the upper left corner of the pallet and to the left and up to $m \Rightarrow 1,0$ logically a unique container with a hole, which it was filled through, was formed, but the permeability, ie through liquid penetration, is absent. That is characteristics of identified in space "black holes".

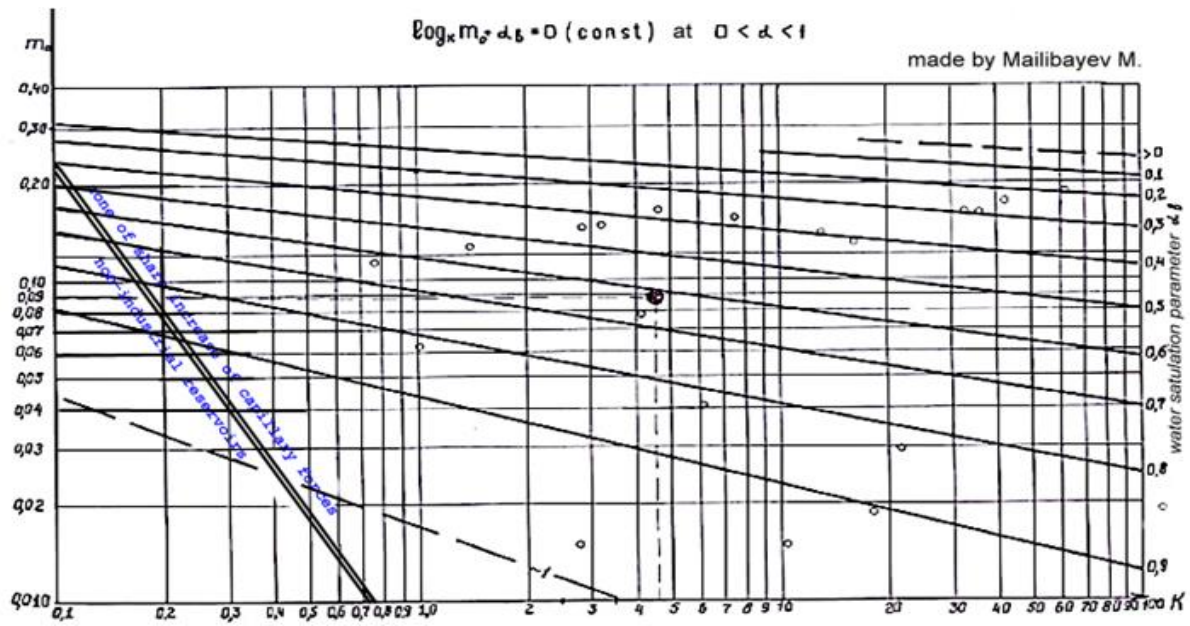


Figure 1: Dependence of three parameters

References:

[1] Mailibayev M (2004): *Microgeodynamics of hydro-saturated reservoir rocks and criteria of oil recovery at extreme Caspian depths*. Zh. Geology and Protection of Mineral Resources, 50-56

