

MATHEMATICAL MODELING OF ELECTRICAL PROPERTIES OF ROCKS' CHANGES, RESULTED FROM INDUSTRIAL POLLUTION.

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A basis for physical - mathematical model's construction is a geological medium and processes occurring in it. The special place at field work, directed to study of geological medium's pollution takes study of aeration zone. We developed theoretical rock's model and received functional dependencies of rock's electric properties from salinity, water content, porosity and lithology. The physical-mathematical model includes a solid phase, porosity and capillaries, which contents water, gas and salts in them. Some part of pore space is filled with clay. Functional dependences of electrical resistivity, dielectric permeability and chargeability from water-physical and physical -mechanical rock's properties are considered. Sensitivity of electrical parameters to salt, water and clay content and lithology changes resulted from suffosion and erosion processes, and from seepage of surface waters in aeration zone has been studied. A numerical modeling of these electrical properties from water and clay content, porosity and type of salt has been made. The range of these parameters' change corresponds to real conditions of aeration zone's industrial pollution. It has been found, that limits of electrical properties' changes allow to execute the control at the changes of environment's properties. The software Petrophysics for account of indicated functional dependences has been made and some templates have been designed. The executed studies can form the basis for development of investigations' technology to control geological environment's industrial pollution with the help of geophysical methods.