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Research Article

SOME FEATURES OF HYDROGEOLOGICAL SYSTEMS OF THE REPUBLIC OF UZBEKISTAN

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ABSTRACT
Geological structures identified by age of main folding, with formation, associations and rock parageneses are objects of regional geotectonics of Uzbekistan.
The forms of geostructures control the structures of hydrogeological systems. Therefore, having geodynamic (tectonic) maps of 1:2500000-1:500000, i.e., according to the scientific picture of the regional geotectonics of the country, we examined the features of its hydrogeological systems. Hydrogeological systems on the studied territory were formed and developed on a platform (Permo-Triassic to Holocene), periogenic (Pliocene-Holocene), orogenic epiplatform (Pliocene-Holocene) and geosynclinal (Paleogene-Holocene) regimes.

Keywords: *hydrogeological systems, hydrodynamic sense, contains groundwater, basins, features*

INTRODUCTION

Platform based hydrogeological systems - the Severo-Ustyurt, Assakeaudan, Zaunguz-Darvazian basins (Mavlonov, 2012) - belong to the same geostructures of the Scythian-Turanian platform. The basement of the above mentioned hydrogeological systems is composed of pre-Mezozoic low water-bearing folded complexes (Akramov, 1982, Mirkamalov, 2011), to which fissured waters are mainly confined.
In the mantle of the hydrogeological systems several structural stages are tracked in the hydrodynamic sense. The lower structural hydrodynamic (subsalt) stage is block by block "sealed" for hypergenesis from Jurassic age. Intermediate structural hydrodynamic (flysch and molassoid sequences of the Cretaceous and Paleogene) stages block by block largely "protect" the underlying aquifers from hypergenesis and cause stagnation of groundwater. The upper structural hydrodynamic stage of systems, composed of low water-bearing and waterproof suites of the Miocene-Holocene, contains groundwater. However, the water availability of the suites is weak due to the scarcity of meteogenic nutrition. Water exchange along the entire section of the systems is stagnant, and therefore the underground waters they contain, like other minerals, are characterized as "nonrenewable reserves".
Periorogenic hydrogeological systems - the Central Kyzylkum group of basins, the East-Priaral and East Kyzylkum basins (Akramov, 1982, Mavlonov, 2012, Mavlyanov, 1971) and the fractured water masses - Bukantau-Dzhetymtau-Takhtau, Aktau-Tamdytau, Kazakhtau, Kuldzhuktau and others (Akramov, 1982, Mavlonov, 2012, Mavlyanov, 1971) are confined to the corresponding synclinal and anticlinal structures. In turn, all these structures are "rastorosheny" blocks - horst-anticlines or graben-synclines of lower orders or to similar forms - with faults of different depths and different lengths.

MATERIALS AND METHODS

For the basins, fallout from the west to the east from the Mesozoic group sediments is typical, and the overall refinement of the thickness of the cover in the "arch of the group". Structure forming sharp boundaries occur in the Cretaceous and Paleogene sediments, and area occur in individual synclines. The sharp boundaries of the neotectonic complex, due to the separating

layers of the Pliocene, are characteristic for the East Kyzylkum basin. The peculiarity of periorogenic systems is the presence of thermal waters at depths from 150 to 500 m, including subthermal and hyperthermal ones (Akramov, 1982, Mavlyanov, 1971). Apparently, this circumstance is determined by the shallow bedding of the basement and the ascending flows of deep heat (or the dissipation of the energy of neotectonic movements).

RESULTS AND DISCUSSION

Low-water arrays under the arid climate are also low in water due to the scarcity of precipitation. The faults are mainly water-bearing, whereas cleavage cracks are slightly watered, and confined waters drain into faults. In them, the cracks are filled with friction grit, grindstone, fine earth and other fine-grained materials, which greatly reduces their water conductivity. Together, these factors reduce the rate of water exchange in arrays or even form "stagnant blocks".

Such is the hydrogeological structure of periorogenic systems, in the upper stage of which ground and fissured waters are fresh or brackish.

Orogenic epiplatform hydrogeological systems are confined to the previously mentioned geostructures: to synclinal - complex basins, and to anticline ones - complex arrays.

The upper structural stage of basins is more often confined to neotectonic formations - terrigenous and molassoid. The weak permeable or water-resistant suites of the latter determine the layerwise sharp filtration boundaries (barriers), and disjunctive ones are delineated into blocks. Due to these circumstances, because of the filtration heterogeneity of the upper stage, the water exchange in it is different and varies from active to stagnant species.

The underlying neotectonides, alpides and cimmerids are also demarcated by disjunctive and sharp boundaries into blocks, the water exchange in strata of which, as a rule, is stagnant. The time of the onset of a stagnant regime determines the age of the groundwater contained in blocks. So it can be assumed that the deeper the basement of the block lies, the "older by age" the underground water it contains.

Epiplatform systems are obviously subject to the full spectrum of tectonic impacts of the orogenic regime. All this has caused a variety of forms and designs of hydrogeological systems, their functions as components of the geological-structural substratum. Large hydro-geological systems - Fergana, NearTashkent, Zarafshan, Bukhara-Karshi and other basins (Akramov, 1982, Mavlonov, 2012, Mavlyanov, 1971) function as part of this diversity. The description of each of them is rather difficult work, if guided by the concepts of mobilism, to update their scientific vision (Abdullaev *et al,* 2012).

Orogenic geosynclinal hydrogeological systems are confined to the structures of the Kuenlun-Mediterranean geosynclinal belt. The largest system among them is the Surkhandarya basin (Akramov, 1982, Mavlonov, 2012, Mavlonov *et al*, 2014).

From adjacent systems it is separated by discontinuities of the submeridional and sublatitudinal directions, and inside - the enclosing basin of the megasinclinal is also dissected by faults into blocks.

The upper stage of the system, composed of terrigenous and molassoid rocks, is characterized by active water exchange, including surface waters. But all this up to the depths of occurrence of weakly permeable or waterproof rocks of the Pliocene-Holocene. As the Pliocene-Holocene penetrates into the section, the rhythmic layers and members of water bodies become more frequent, which together with fissure, tectonics blocks water exchange in confined spaces. The aged "regional waterproof" is the thickness of the Eocene clay (Troitsky and Mirzaev, 2014). However, blocks of stagnant water exchange can take place up to the basement. In the basement, apparently, there are fissured waters that accumulate in the cavities of cracks and veins.

In some horst-anticlines, in the water-bearing suites of the Paleogene and the Cretaceous, thermal waters are discovered.

Hydrogeological systems are part of the geological-structural substratum. Because of tectogenesis they are subject to baric, thermodynamic and practically the whole spectrum of geophysical and geochemical influences. This determines the values of reservoir pressures and temperatures and their other characteristics. Each structural stage of systems is characterized by the inherent values of water exchange indicators in the current and historical time scale, and the system as a whole in geological terms.

The form and intensity of water exchange to some extent "control" the nature of the metamorphism of waters from fresh to brine and brimes. But in itself, water exchange is "controlled" by tectogenesis.

Conclusion

In conclusion, we note one circumstance. Folded foundation, as is known, is heterogeneous and stratifies into "layers". The upper, "granite layer", enclosed between the bottom of the sedimentary cover and the Conrad interface, with a density of 1.8-2.5 g/cm^3 and the lower one - a denser basaltic layer - from the Conrad boundary to the Mohorovicic surface (**Akramov, 1982**) - or the "Conrad layer". In anticlinal structures where the "granite layer" is on the surface, the water exchange by infiltration, elision and lithogenetic cycles are at their intrinsic depths. In the synclinal structures of the sedimentary cover the infiltration cycle is characteristic of underground aquifer systems that are the first from the surface of the earth. Further along the entire section up to the Conrad boundary (i.e., already in the basement), the elimination cycle dominates. In the Conrad layer elision cycle joins with the lithogenetic cycle forming the basis of hydrogeological systems in which dehydration of water-containing substances rising from the upper mantle, or hydration of the components of the "basalt layer" penetrating with water through the faults occurs.

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