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INFLUENCE OF ANTHROPOGENIC FACTORS ON HYDROGEOCHEMICAL CONDITIONS OF UNDERGROUND DRINKING WATERS OF KAZAKHSTAN

Abstract. Assessment of changes in hydrogeochemical conditions of groundwater deposits in Kazakhstan under climatic effect and human impact is an important scientific and practical problem. The study of the water-rock system of drinking groundwater deposits under conditions of anthropogenesis and climate change will allow timely prevention of the underground hydrosphere negative processesand preservation of drinking groundwater quality. The main task of preserving the quality and usable groundwater resources from pollution and depletion can be solved only on the basis of a deep study of the hydrogeochemical conditions of groundwater deposits.This will allow timely detection of possible negative processes in the aquatic environment and taking the necessary measures to prevent the further development of the aquatic ecosystem degradation. Conducting the constant monitoring of all aquatic ecosystem components and the most valuable drinking groundwater deposits is the main purpose of planned scientific research. Kazakhstan's water security is an important strategic task, which is aimed toward many years to come.

Key words: drinking groundwater, pollution, usable resources.

Introduction. The contamination of fresh drinking water resources is one of the most important human-caused problems. Along with the growing population size and the development of industry and agriculture, the issue of clean drinking water has become very important and will soon become one of the most important problems of mankind. The results of the research show that today the issue of groundwater, especially in large and densely populated cities of the world, faces a lot of problems. The penetration of industrial waste into the soil, the availability of absorbing wells for the human livelihood waste disposal, the excessive use of detergents and chemical purifiers, entry of chemical fertilizers and pesticides into the ground contaminate groundwater in the most serious, if not the irreversible way.

Statistical investigations show that each person uses an average of 300 litres of water per day in developed countries, in particular for bathing, washing dishes and clothes, washing hands and face, watering gardens, fruit and vegetable gardens and household plots. That is why, today governments are only trying to provide clean water without microbial treatment, i.e. by way of chlorination process. Meanwhile, the problem of contaminants dissolved in water remains in place.

The methods of researches. The territory of the Republic is located in the arid zone, except for mountain and piedmont areas, where the average annual precipitation is exactly high. This helps to maintain the water level of even land due to surface and groundwater flow. Provided that the obligatory river water intakes (on ecology, energy, etc.) are fulfilled in the years with average water level, in general the Republic is provided with water within the limits of the standard. In dry years, the water supply level is 60% in general, while the shortage is mainly for irrigated agriculture.

In particular, water-ecological and water-energy problems with bordering countries remain unresolved. In recent years the problem of using water coming from the territory of neighbouring countries has

become acute: the river flow to Kazakhstan from neighbouring countries is reduced, which causes the water resources shortage. According to the program, this trend is forecasted in the following years.

However, the hydrogeological features of the country predetermined the uneven territorial distribution of the resources of drinking and household drinking groundwater, which affects the water supply of its individual regions: about 50% of the resources are concentrated in the south of the country, 30% are in the central, northern and eastern regions, and less than 20% are in the west [1-4].

Drinking water quality. *Dissemination of pollutants.* Solid and liquid pollutants are released from the soil into sources of water supply as a result of so-called leaching. Small amounts of waste dumped on the ground are dissolved by rain and fall into groundwater, and then into local streams and rivers. Liquid waste quickly penetrate into the sources of fresh water. Solutions for spraying crops either age when they come into contact with the soil, or fall into local rivers, or leach out in the ground and penetrate into the groundwater. Up to 80% of such solutions are wasted, as most of them simply fall into the soil.

The time required for pollutants (nitrates or phosphates) penetration from soil to groundwater is not known, but in many cases this process can last tens of thousands of years. Pollutants coming into the environment from industrial plants are called industrial wastes and emissions.

Environmental legislation is an effective mean of preventing pollution, but it is difficult to achieve compliance with it. Therefore, a new international initiative – "the party responsible for pollution" pays - is ideal in its essence, but it rarely yields fruits. The World Health Organization(WHO) has published recommendations on permissible levels of pollution. For example, the cadmium content in water should not exceed 0.003 mg/l.

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ҚАЗАҚСТАННЫҢ ЖЕР АСТЫ СУЛАРЫНЫҢ АУЫЗ СУ САПАСЫНЫҢ ГИДРОГЕОХИМИЯЛЫҚ ЖАҒДАЙЛАРЫНА АНТРОПОГЕНДІК ФАКТОРЛАРДЫҢ ӘСЕРІ

Аннотация. Қазақстанның жер асты суларынаклиматтық және антропогендік әсер етуінен гидрогеохимиялық жағдайыныңөзгерістеріне баға беру ғылыми және практикалық маңызды мәселе болып табылады. «Су-жыныс» жүйесінзерттеу антропогенез және климаттың өзгеруі жағдайында ауыз су мақсатындағы жер асты суларыныңжәнежер асты гидросферасының кері әсер ету процестерін уақытылы алдын-алуғажәне сапасын сақтауға мүмкіндік береді. Техногенездің әсер етуі және табиғи ортаны ластауы жер асты суларының қоршаған ортаның ластану деңгейін уақтылы анықтау үшін су экожүйесінің барлық компоненттерінің тұрақты мониторингін қажет етеді.

Жерасты суларының сапасы мен пайдалану қорларын ластанудан және сарқылудан сақтаудың басты міндеті жер асты суларының гидрогеохимиялық жағдайларын терең зерттеу негізінде ғана шешілуі мүмкін.Бұл су ортасында мүмкін болатын жағымсыз процестерді уақтылы анықтауға және су экожүйесінің тозуының одан әрі дамуына жол бермеу үшін қажетті шараларды қабылдауға мүмкіндік береді.

Түйін сөздер: жер асты сулары, климаттық және антропогендік әсер, техногенездің әсер.

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ВЛИЯНИЕ АНТРОПОГЕННЫХ ФАКТОРОВ НА ГИДРОГЕОХИМИЧЕСКИЕ УСЛОВИЯ ПОДЗЕМНЫХ ВОД КАЗАХСТАНА ПИТЬЕВОГО КАЧЕСТВА

Аннотация. Оценка изменений гидрогеохимических условий месторождений подземных вод Казахстана при климатических и антропогенных воздействиях представляет собой важную научную и практическую задачу. Изучение системы «вода – порода» месторождений питьевых вод в условиях антропогенеза и изменений климата позволит своевременно предотвращать негативные процессы подземной гидросферы и сохранять качество подземных вод питьевого назначения. Основная задача сохранения качества и эксплуатационных запасов подземных вод от загрязнения и истощения может быть решена только на основе глубокого изучения гидрогеохимических условий месторождений подземных вод. Это позволит своевременно выявлять возможные негативные процессы водной среды и принимать необходимые меры по предотвращению дальнейшего развития деградации водной экосистемы. Изучение питьевых подземных вод Казахстана должно стать важной составляющей общих исследований водных ресурсов республики, как одного из самых ценных полезных ископаемых на Земле. Водная безопасность Казахстана является важной стратегической задачей, нацленной на многие годы вперед.

Ключевые слова: питьевые подземные воды, загрязнение, эксплуатационные запасы.

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