RADIOMETRIC STUDY OF RADIONUCLIDES IN WATER AROUND THE ARNASAY-AYDARKOL REGION

Jonzakov Azizjon Alimjonovich, Bo`riboyeva Vazira Baxodir qizi
Jizzakh State Pedagogical Institute, Jizzakh, Uzbekistan
e-mail: a.jonzakov2203@mail.ru

Abstract.*In the article a comprehensive assessment of the radiation safety of natural and underground water is studied. The radiometric analysis were used to determine the radiation contamination of water with natural radionuclides.*

Keywords: *natural, underground water, Aydarkul, activity, radionuclide, radiometric analyze, dose*

***

Aydar-Arnasoy hududi suvlaridagi radionuklidlarni radiometrik yo`l bilan o`rganish

Annotatsiya. *Ushbu ishda tabiiy va yer osti suvlarining radiatsiyaviy xavfsizligini baholangan. Suvning tabiiy radionuklidlar bilan radiatsiyaviy ifloslanishini aniqlash uchun Radiometrik tahlil usulidan foydalanilgan.*

***Kalit so`zlar:*** *tabiiy, yer osti suvlari, Aydarko`l, aktivlik, radionuklid, radiometrik tahlil, nurlanish dozasi.*

***

Радиометрическое исследование радионуклидов в воде Арнасай-Айдаркольского региона

Аннотация.*В статье исследуется комплексная оценка радиационной безопасности природных и подземных вод. Радиометрический анализ применялся для определения радиационного загрязнения воды природными радионуклидами.*

Ключевые слова: *природные, подземные воды, Айдаркуль, активность, радионуклид, радиометрический анализ, доза.*

INTRODUCTION

As we know that, at present a large-scale studies on radiometric monitoring of the environment is carried out all over the world. According to recent investigations, the proportion of radiation that a one person gets from natural sources of radiation throughout his life is on average 87%, and the remaining 13% - from technogenic sources. So, the radiometric monitoring of the environment is very urgent and important problem, today. Water sources may contain radionuclides of natural or technogenic origin [1]. Naturally occurring radionuclides, including potassium-40, as well as radionuclides arising from the decay of thorium and uranium, in particular radium-226, radon-222, uranium-234, uranium-238 and lead-210, can enter the water as a result natural processes (for example, when absorbed from the soil) or technological processes using radioactive materials of natural origin (for example, during the extraction and processing of mineral sand or in the production of phosphate fertilizers). Quality of

natural and ground waters used for consumption in this region is one of the determining factors for the normal life of the population.

Radon is a colorless and odorless radioactive monoatomic heavy gas. Solubility in water at room temperature is 460 ml/l, which is higher than the solubility of lighter inert gases. In organic solvents the solubility of radon is ten times higher than in water. The density of radon under normal conditions is 9.73 kg/m^3, which is approximately 7.6 times the density of air. The concentration of radon can change on a daily basis, therefore, long-term measurements of the average concentration of radon in rooms where a person spends a significant part of the time is necessary [2]. Radon concentration is subject to natural fluctuations due to factors such as changing weather conditions, so the initial test may give an inaccurate result regarding the average radon concentration. The level of radon in the air is maximal in the coldest part of the day, when the pressure drops are greatest [3].

RESULTS AND DISCUSSION

From these considerations, the determination of radon and radium in natural and underground water is an obvious task for assessing the radiation situation in the region. There are numerous classical physicochemical and physical methods for the determination of radon in liquid samples. But they do not meet the express definition requirement. In our opinion, the following instrumental and express method for determining radium is more suitable. The quantitative determination of the radon content in natural water was carried out by the emanation method. The essence of the emanation method for the determination of radium lies in the quantitative separation of radon from a solution containing radium isotopes, and radiometric measurement of the activity of emanation and its decay products on a laboratory alpha-analyzer. The measurement method is based on radiometer - RRA-01M-01. The experimental data for determining the concentration of Radon-222 are given in Table 1.

Table 1

№	Water type	Concentration of Radon (Bq/l)
1	Underground water	< 50
2	Surface water	2-5
3	Fissure water	10-100
4	Mineral water	<186
5	Natural water	180-190
6	Well water	<100

Fissure waters of limestone, sandstone, shales usually have a radon concentration in the range of 10–100 Bq /l. Od- however, in some cases and in these breeds, increased concentration of radon. Groundwater in the horizontal direction near the surface, usually have a lower concentration a radon concentration of less than 50 Bq/l. In surface waters the concentration of radon, as a rule, does not exceed 2–5 Bq/l, mainly som due to the fact that radon has time to decay during the existence of under surface conditions or escape to the atmosphere due to aeration. And the content of radon in mineral waters is not exceeds 185 Bq/l.

CONCLUSION

Depending on the geological and hydrogeological conditions, the different areas of the region create formation of a wide spectrum of background concentrations of radon. The level of radon content in groundwater ranges from 10 to 100 Bq/l, in some areas up to going up to hundreds and even thousands of Bq /l.

REFERENCES

1. Sanitary Norms and Rules № 0193-06 “Norms of radiation safety (NRB-2006) and basic sanitary rules for ensuring radiation safety (OSPORB-2006), Tashkent, p. 2006- 85.

2. Vasilenko O.I. Radiation ecology. – M. : Medical, 2004. – 216 p.

3. Abulfaraj W.1I. and Mamoon A.M. Factors affecting radon removal from Rn-222 enriched water. Appl. Radiat. IsoL, Vol. 46 (1995), No. 6/7, p. 609 – 610.

4.Jonzakov A. ИССЛЕДОВАНИЕ ЭРОЗИИ И СЕДИМЕНТАЦИИ ПОЧВ В ЮГО-ЗАПАДНЫХ ОТРОГАХ ЗАРАФШАНСКОГО ХРЕБТА МЕТОДОМ γ-СПЕКТРОМЕТРИИ //Архив Научных Публикаций JSPI. – 2020.

5.BEKMIRZAEV, R. N., SULTANOV, M. U., HOLBUTAEV, S. H., JONZAKOV, A. A., & TURAKULOV, B. T. (2020). MULTIPLICITY OUTPUTTING OF HADRONS IN CC-INTERACTIONS AT THE MOMENTUM 4.2 A GEV/C WITH DIFFERENT COLLISION CENTRALITIES. *ACADEMICIA: AN INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL*, *10*(10), 900-907.

6.Шарипов, Ш. С. (2017). Personality model of modern taecher. *Eastern european Scientific Journal–Germany*, 93-96.

7.Orishev, Jamshid (2021) "PROJECT FOR TRAINING PROFESSIONAL SKILLS FOR FUTURE TEACHERS OF TECHNOLOGICAL EDUCATION," *Mental Enlightenment Scientific-Methodological Journal*: Vol. 2021 : Iss. 2 , Article 16.