
GEOCHEMICAL PROPERTIES OF IRRIGATED MEADOW SAZ SOILS OF THE SHAHRIKHANSOY PLAIN

U. B. Mirzayev

Fergana State University, Candidate of Biological Sciences.

mirzayev.ulugbek1512@mail.ru

M. I. Koldasheva

basic doctoral student of the Andijan Institute of Agriculture and

Agrotechnologies

koldasheva.mamura@mail.ru

Abstract

The Shahrikhonsay cone has a complex geomorphological structure, acquiring unique chemical, agrochemical and land reclamation properties, which are formed in correlation with their geochemical properties. The article discusses this, analyzes the geochemical properties of elements according to the groups of isolated groups using the example of cyclic elements, and highlights their uniqueness.

Keywords: Cyclic elements, geochemistry, element composition, migration, Clark., anthropogenic factor, concentration, Clark, parent rock.

Introduction

In the world, scientific research is being conducted in such priority areas as restoring, maintaining and increasing soil fertility, studying changes in human influence related to irrigation, and studying the quantitative composition, migration and accumulation and differentiation of elements in landscape blocks. Although the properties and characteristics of soils, their origin, and progressive development are elucidated based on the results obtained in a number of analyzes, ultimately the composition of these components is directly and inextricably linked to their elemental composition, and these data are mutually interconnected and complementary. The elemental composition of the soil in relation to the lithosphere and other crusts, the movement of elements in it, migration, distribution, and similar aspects are considered one of the main tasks of

E- Global Congress

Hosted online from Dubai, U. A. E., E - Conference.

Date: 30th January 2026

Website: <https://eglobalcongress.com/index.php/egc>

ISSN (E): 2836-3612

pedogechemistry, which studies the soil cover formed in the upper crust of the lithosphere, and is an important section that studies its formation and connection with the environment.

Research object and methods

The research area chosen as the Shahrikhonsoy spread is irrigated meadow sedge soils formed in the Shahrikhonsoy spread. The systematic pedogeochemical methods recommended by BBPolinov, MAGlazovskaya, AIPerelman were also widely used in the research, and landscape-geochemical sections were placed from top to bottom in the cone spread based on the relative heights of the soils.

Results and discussion

Issues related to the origin, properties and characteristics, and natural conditions of the soils of the Shahrikhonsoy plateau were first reflected in the studies of BV Gorbunov [2]. Although the conducted studies shed light on the properties and characteristics of soils, their origin, and progressive development based on the results obtained in a number of analyzes, such as their chemical, agrochemical, and physical indicators, ultimately the composition of these components is directly and inextricably linked to their elemental composition, and these data are interconnected and complement each other.

Geochemistry has emerged as a science that studies this information and its analysis. This science deeply studies the chemical composition, distribution, migration, and formation processes of rocks, soil, and natural waters of the entire planet and its components (lithosphere, hydrosphere, etc.).

Geochemistry is relatively young among other sciences, and separated from biogeochemistry a little earlier, and Academician Fersman described it in 1929 as "a new scientific direction that studies the history of the chemical elements of the Earth." It was officially recognized as an independent science in the first decade of the last century by VI Vernadsky, who defined the essence of the science as follows: - "Geochemistry is the science that studies the history of the elements on our planet."

Most researchers group chemical elements according to Clark quantities. According to him, the elements of the earth's crust are divided into 6 groups

E- Global Congress

Hosted online from Dubai, U. A. E., E - Conference.

Date: 30th January 2026

Website: <https://eglobalcongress.com/index.php/egc>

ISSN (E): 2836-3612

according to VI Vernadsky. Based on the data of the geochemical grouping classification, we studied the groups except the first group in the cross-section of the regions. The quantities of Au from the group of rare metals, Fe, Ca, K, Na, Mn, Mo, Ba, Sr, Zn, Cr, Ni, Co, As, Hf, Sb from the 3rd group were determined and analyzed.

According to the results, the soils of the study area also have unique characteristics compared to the soils of the studied areas of the Valley.

The Clark value of potassium in soils is about 1-3, which is 10-15 times higher than the total forms of nitrogen and phosphorus. Unlike nitrogen, its organic form in the soil is very low (it increases in proportion to the increase in humus in the soil). Its quantitative indicators are formed mainly depending on the mineralogical composition of the parent rock. The composition of the parent rock is formed depending on the enrichment of potassium-containing feldspars and micas with up to 10-12% K₂O-enriched weathering products, i.e. secondary minerals - illite, vermiculite, smectite, kaolinite, as well as mixed minerals such as smectite-illite, smectite-vermiculite, chlorite-smectite. The lithosphere Clark value in the soil is 1.3, and its content in the soils of the area where we conducted the study was observed to be low compared to background values. In other studied areas of the valley, in particular, the soils of the Shahimardonsay extension, an average decrease of about 0.3-0.4% was observed. This is also reflected in its agrochemical indicators, indicating the proportionality of its quantitative status in the lithosphere-parent rock-soil system.

Similarly, according to the results of comparative analysis, it was observed that compared to the soils of the studied gray soil region of the valley, the amounts of Au, Na, Ba, are low, and the amounts of Te, Zn, Sb are high. However, there are no significant differences in the amounts of other elements.

Also, as previous researchers [1., 3.] have shown, in general, the distribution of cyclic (revolving) elements varies depending on their Clark content in the soil, as well as on the humus and mechanical composition.

The decreasing order of the amount of cyclic elements in the top layer of the soils of our study area is as follows.

E- Global Congress

Hosted online from Dubai, U. A. E., E - Conference.

Date: 30th January 2026

Website: <https://eglobalcongress.com/index.php/egc>

ISSN (E): 2836-3612

$$\text{Section 1: } \frac{\text{Fe}}{3,3} > \frac{\text{K}}{0,96} > \frac{\text{Na}}{0,37} > \frac{\text{Ba}}{0,078} > \frac{\text{Mn}}{0,039} > \frac{\text{Sr}}{0,025} > \frac{\text{Zn}}{0,011} > \frac{\text{Cr}}{0,008} >$$

$$\frac{\text{Co}}{0,0015} > \frac{\text{As}}{0,0012} > \frac{\text{Ni}}{0,001} > \frac{\text{Hf}}{0,00046} > \frac{\text{Sb}}{0,000013} > \frac{\text{Mo}}{0,00001};$$

$$\text{Section 2: } \frac{\text{Fe}}{2,58} > \frac{\text{Ba}}{0,74} > \frac{\text{K}}{0,70} > \frac{\text{Na}}{0,42} > \frac{\text{Mn}}{0,033} > \frac{\text{Sr}}{0,029} > \frac{\text{Zn}}{0,008} > \frac{\text{Cr}}{0,008} >$$

$$\frac{\text{Ni}}{0,004} > \frac{\text{Co}}{0,0012} > \frac{\text{As}}{0,0008} > \frac{\text{Hf}}{0,00035} > \frac{\text{Sb}}{0,00012} > \frac{\text{Mo}}{0,00003};$$

$$\text{Section 3: } \frac{\text{Fe}}{3,18} > \frac{\text{K}}{1,14} > \frac{\text{Na}}{0,40} > \frac{\text{Ba}}{0,09} > \frac{\text{Mn}}{0,032} > \frac{\text{Sr}}{0,032} > \frac{\text{Zn}}{0,010} > \frac{\text{Cr}}{0,0085} >$$

$$\frac{\text{Ni}}{0,0035} > \frac{\text{Co}}{0,0015} > \frac{\text{As}}{0,0011} > \frac{\text{Hf}}{0,0006} > \frac{\text{Sb}}{0,00013} > \frac{\text{Mo}}{0,00007};$$

$$\text{Section 4: } \frac{\text{Fe}}{3,16} > \frac{\text{Na}}{0,386} > \frac{\text{K}}{0,138} > \frac{\text{Ba}}{0,073} > \frac{\text{Mn}}{0,37} > \frac{\text{Sr}}{0,032} > \frac{\text{Zn}}{0,011} > \frac{\text{Cr}}{0,0081} >$$

$$\frac{\text{Co}}{0,0014} > \frac{\text{Ni}}{0,001} > \frac{\text{As}}{0,001} > \frac{\text{Hf}}{0,0005} > \frac{\text{Mo}}{0,00044} > \frac{\text{Sb}}{0,00012};$$

The data presented show that the predominant content of iron in newly developed, newly irrigated typical gray soils and gray lands is a characteristic feature. It was observed that the content of iron increases inversely with the development period, that is, under the influence of irrigation, iron is washed together with silt particles towards the underlying carbonate-illuvial layer and accumulates in this barrier.

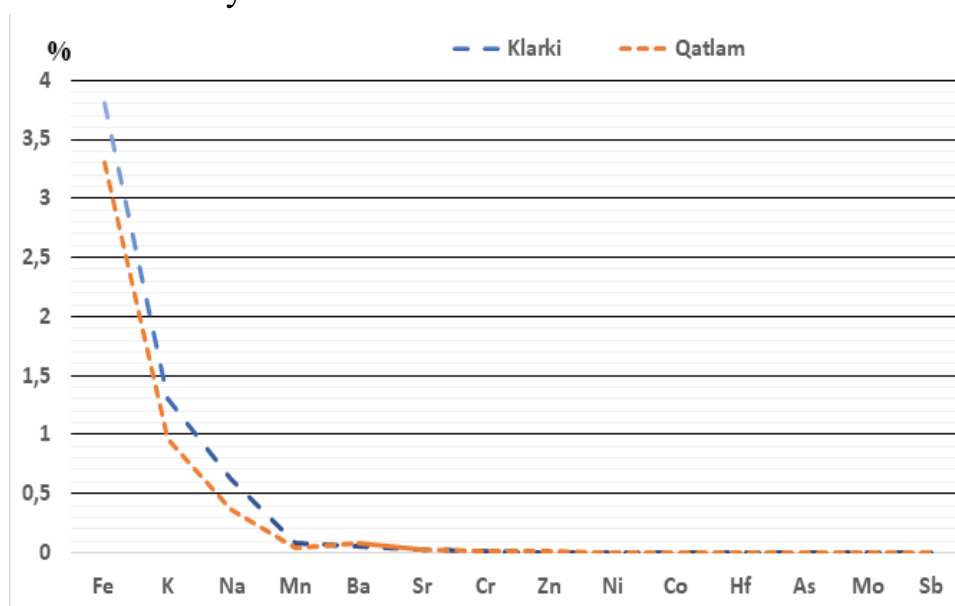


Fig. Geochemical spectrum of cyclic elements and soil clarke in the Haydov layer of the region's soils

E- Global Congress

Hosted online from Dubai, U. A. E., E - Conference.

Date: 30th January 2026

Website: <https://eglobalcongress.com/index.php/egc>

ISSN (E): 2836-3612

According to the geochemical spectrum of cyclic elements in the soils of the study area, the soils are closely related to each other, with relatively small significant differences oscillating within a small range (figure).

Conclusion

According to the above, the agrochemical composition of conic-spreading soils, which are developing under the extensive influence of anthropogenic factors, is directly related to their geochemical state. The accumulation and redistribution of substances in them can change as a result of the direct influence of the human factor associated with irrigation and cultivation, leading to an increase in some elements and a decrease in others. This situation indicates that it is not without benefit to carry out fertilization and cultivation processes in the relevant landscape elements in a coordinated manner, using the results of the elemental composition of the soil.

Literature

1. Abdukhakimova XA Geochemistry of irrigated soils of the Shohimardonsay cone spread. Dissertation written for the degree of bffd (PhD). Fergana. 2021. 120 p.
2. Gorbunov B.V. Pochvy Andijanskoy oblast / V kn.: Pochvy Uzbekskoy SSR. - T.II. - Tashkent, AN UzR, 1957. S. 48-52.
3. Isagaliev M. Geokhimicheskie svoystva oroshaemyx pochv Sokhskogo konusa vynosa. Dissertation na soiskanie kandida biologicheskix nauk. - T.: 2010. B. 80-120.