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QUANTITY AND GEOCHEMICAL PROPERTIES OF MOLYBDENUM IN SALINE SOILS

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A B S T R A C T

Today, the practice of farming in irrigated areas in the world, the study of the chemical and geochemical properties of saline soils from a pedogeochemical point of view, the study of chemical elements in agrolandscapes in the chain of plant-soil-mother rock and soil layers are among the urgent problems of our time.

K E Y W O R D S

INTRODUCTION

Of course, in the soil, in the living world, in the water, in the atmosphere, in the plant, there are many chemical elements of the periodic table of D.I. Mendeleev. Until now, scientists have not been able to identify a large part of them, fully study their role on Earth. A number of scientists' classifications are also relative, that is, based on certain properties and properties of elements, these classifications can change over time and with the accumulation of new data (Vernadsky V.I., 1965, Kist A.A., 1987, Perelman A.I., 1989, etc.).

A.G. Akhmedov [1], B.P. Akhmedov [2], P.N. Besedin [3], E.K. Kruglova, M. Aliyeva and b. [4], O.V. Chernova, T.M. Sileva [5] and many other scientists [6, 7] have made great merits in the study of microelements of soil [6, 7].

Depending on their amount and physiological role in the lithosphere and soil, plants, their role in increasing soil fertility and improving yields, elements such as B, Cu, Zn, Mn, Mo, Cr are relatively called biomicroelements. The reason for the separate separation of these elements is that in the system of irrigated farming their number of properties and characteristics are better studied in relation to others.

For example, Mo fluctuates around 3-4 mg/kg in healthy plants, and around 33-38 mg/kg in infected species. Plants will be in demand for mo, but according to the data, plants will need molybdenum less than other biomicroelements. There are also cases that plants that contain 10-20 mg / kg of molybdenum are harmful to most fauna. Its content in the soil is also not much, but low compared to most microelements. But Mo can be accumulated in layers rich in organic matter. MoO occurs in various combines in soil, but the form in which plants can take is MoO^{4-2}.

Microelements, some of the characteristics of which are noted above, are widely used in cotton farming. One of the ways of effective use of biomicroelements is to study their gross and motile amounts in the soil composition and their migration chain.

Object and methods of the research. Irrigated meadow reed bog soils of varying degrees formed on alluvial and alluvial-proluvial beds of Central Fergana were selected as the object of research.
Mobile volumes of microelements used in agriculture were developed by E.K.Kruglova, M.Alieva et al. (2018) at the regional agrochemical laboratory E.K.Kruglova, M.Alieva et al. (2015). and K.V.Verigina methods. The gross content of soil and plant composition of microelements was determined by the neutron activation analysis method at the Institute of Nuclear Physics. And for data processing, a program called "microelement" was used.

Results of the Study

The content of the element molybdenum in the soil is low and ranges from 3·10-4 %. In soils rich in organic matter, Mo+6 → is reduced to Mo+2, as a result of which it passes into a weak motile group. +6 valent molybdenum is relatively mobile in soils with a neutral and weak alkaline environment and is favorable for plant assimilation [6].
During the study, the amount of Mo in irrigated meadows was determined and is presented in Table 1 below.

Table 1 Amount of Mo in irrigated meadow thatchy soils, mg/kg [6]

Cutting t/r	Depth, cm	Gross	Harakatchan
9 A	0-40	3,01	0,75
	40-55	2,45	0,90
	55-89	2,55	1,1
	89-143	4,65	1,60
	143-212	6,55	2,01
	Tuproq klarki	2	

According to the data in the table, there is a difference in the distribution laws and quantities of Mo in the soil, and this difference is visible in the driving and sub-plough layers, and between the mother sex and the other strata, i.e., differentiated accordingly. And in the layers in contact with water, along with carbonateous forms, coulds of the gel layer cod.
In saline soils, molybdenum accumulates. Molybdenum resembles Zn, B, Cu in soils with weak alkaline and neutral environments. With an increase in the level of soil irrigation, not much change in the amount of molybdenum is noticed, that is, in plowed layers its amount is 2.11-3.01 mg / kg. Higher concentrations are corresponding to the mother rock of soils, contact zones with tap water. The stress of molybdenum is variable, due to which it participates in oxidation and reduction. But it is relatively small in both +4 and +6 valent states, and the difference also has a low ion radius, i.e. Mo+4 - 0.68 nm, Mo+6 - 0.65 nm, so these participate in molybdenum minerals in almost the same amount. It is relatively easier to assimilate by the plant.
The amount of the same elements contained in different soil conditions is observed, but is subject to some general laws. This legislation is most often expressed in their average numbers, quantities.
It is known that the average quantities of elements in the lithosphere were called Clark, according to the proposal of A.E. Fersman. The soil clark was developed by A.P. Vinogradov in which the migration of elements in the soils leads to their redistribution, as a result, their performance differs from the previous clark. This difference is referred to as concentration clark (KK) as described by A.I. Perelman.

The highest amounts of PPE are in mineral deposits, locally and globally contaminated areas. Under irrigated soils, the highest KK of 2-3 varieties can be seen in the distribution of Mo's KK. They are the uppermost, i.e., evaporative, relatively lowest-glaciated, medium carbonate-gypsum layers, the accumulation of which at these barriers is relatively greater, as can be seen in Table 2.

Mo's KK is irrigated, i.e., larger than once in the soils of Section 9A. Even in layers that are in contact with slip water, these indicators remain relatively high.

Another of the geochemical magnitudes is the Clark distribution (Kt). For example, the highest index of Mo in terms of KK is 3.3, while the highest index for Kt is 0.82. This means that in soils there is the ability for differentiation. In this context, if we pay attention to the relationship between the soil layers and the mother sex, this relationship is called the radial differentiation coefficient and is expressed by Kr.

This correlation is estimated by Kr < 0.5, according to the literature; Kr 0.5-1.0; Assuming that there is no correlation as Kr > 1.0, it is moderate and high, according to these indicators, the relationship between the mother genus of soils and the upper genetic horizons in the elements studied is as follows (Table 2, Figure 1).

Table 2 Geochemical properties of Mo [6]

Cutting t/r	Depth, sm	Mo		
		MONTHS	Kr	Kt
9A	0-40	1,5	0,46	0,66
	40-55	1,2	0,37	0,82
	55-89	1,3	0,39	0,78
	89-143	2,3	0,71	0,43
	143-212	3,3	1,0	0,31

So the relationship between the native rocks of molybdenum and the genetic layers of the soil is small.

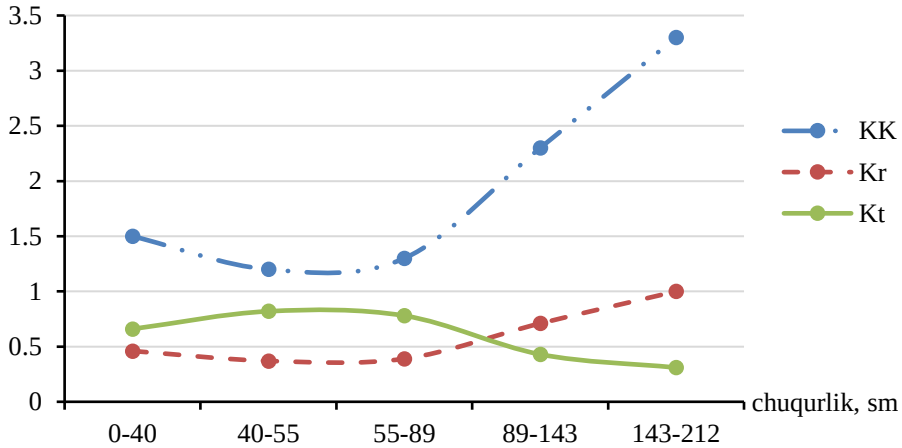

Figure 1. Graph of geochemical properties of Mo in soil layers

Living organisms, including plants, contain almost all elements in the periodic table of elements. For example, in living organisms, the average Mo-$2 \cdot 10^{-5}$ %, Ni-$8 \cdot 10^{-5}$ %, Cu-$3.2 \cdot 10^{-4}$ % and so on. If we look at the plant world from this point of view, most of the elements in the periodic table have been

identified in them. The amount of elements contained in plants depends on the variety of the plant, soil properties and ionic properties of the element.

In the study of the motile and gross molybdenum content in the soil, concentration clar, in particular in radial differentiation coefficients, it is first noticed that its amount is slightly higher in saline soils, but no evidence has been found.

Focusing on the concentration clark of molybdenum relative to its amount in the lithosphere, this indicator is weak and average, 2.45 respectively in strongly saline lands; 6,32; 12.94 KK makes this an anomaly of weak, medium to high. Molybdenum content in weak, moderate, and highly saline irrigated meadows has an average of 3.17; 8,16; It is 16.70 mg/kg and respectively forms an anomaly and gives rise to the province.

Conclusions

In positive provinces, the element or their association is relatively abundant in the soil, and high fertility is achieved when a group of plants in need of that element is planted. The element or association of elements belonging to the negative province will be less than sufficient for the plant in the soil, in addition to remedy this situation, the appropriate microelement is additionally injected into the soil.

Weak, moderate to high-grade molybdenum is typical of saline, irrigated meadow thatchy soils, in which the amount of Mo is present at 2–4 KK, 6–10 KK, 10–12 KK. Molybdenum deficiency is felt when its amount is concentrated in the soil at the rate of 1.5 mg / kg.

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