RESEARCH OF AN ELEMENT EXCHANGE IN SYSTEM "SOIL - WATER" BY THE ACTIVATION ANALYSIS METHOD

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Universal salinity of soil in Aral-zone, the adverse ameliorative condition of existing irrigating systems strongly affects quality of irrigation waters. On the other hand questions of washing salted soil in the certain degree demand studying dynamics of change of element structure soil at interaction with waters.

Therefore we have studied dynamics of change more than 12 chemical elements in soils a various degree salinity (soil are selected in Republic Karakalpakstan) at washing with distilled water in laboratory conditions and in natural conditions (in field experiences) at showering of soil with irrigational channels water for an establishment of a mobile part.

For an establishment of the dissolved part of chemical elements in soils prepared a series parallel sheds on 500 g (2-3 repeatability). Then 2-3 parallel sheds mixed with distilled water in volume on 500 ml. Through the certain time intervals the received mix has filtered through a filtering paper.

As an example in figure dynamics of change of elements Na, Ca, Ba in soil and distilled water is resulted. It is visible, that at the first o'clock of contact a soil with water up to 20 % Na, 20-22 % Ca, and 40 % Ba pass in water. Further occurs of sorption elements of soil, and process of washing away of elements goes in the opposite direction.

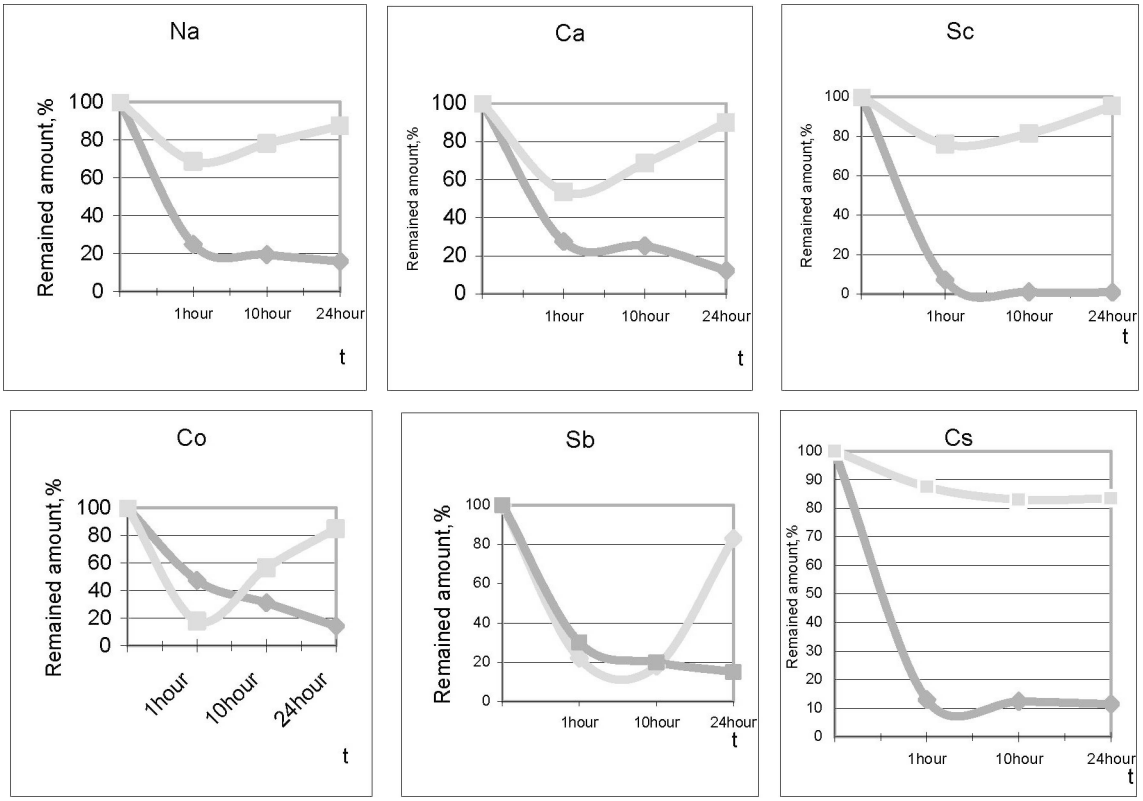
Extraction of alkaline ground elements identical each other. Process of sorption of elements Na, Ca, Cs, Ba and Rb, (fig. 1) of soil after 1-2 hours contact under the identical circuit, apparently is connected to affinity of their physical and chemical properties, especially affinity of their ionic radius.

For elements of group of iron (Fe and Co) process of extraction water and return sorption soil differ a little. In this case we can see that return сорбция Co and Fe soil begin after 10 hour contacts. The given process is probably connected to the form of migration of these elements, hence and ionic radiuses.

Process of extraction and sorption Br water and soil is similar with elements of group of iron.

It is interesting the legitimacy of extraction of rare-earth elements (REE) (Sm, Yb) water and sorption their soil. In this case up to 40 % REE from soil extract water further occurs sorption their soil. Practical 80-100 % these of elements back sorbs clay substances of soil.

Besides affinity of physical and chemical properties of REE are determined accordingly by processes of extraction and sorption their water and soil.



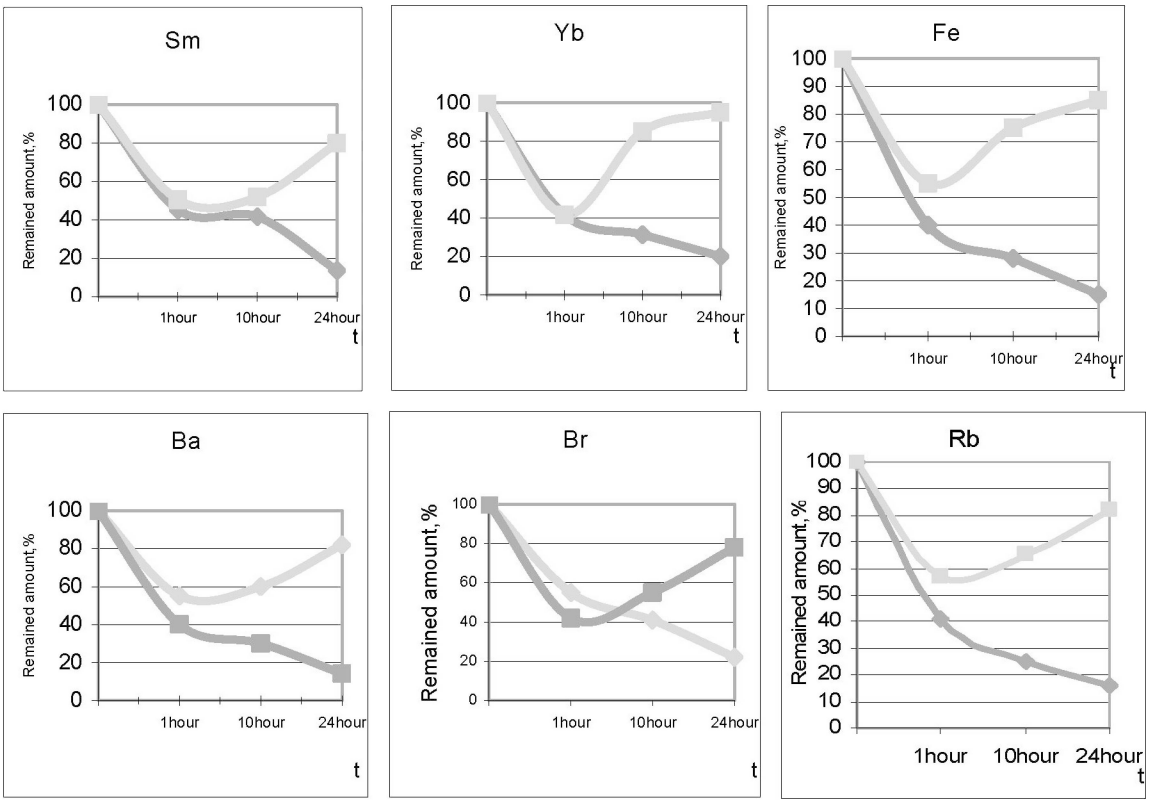


Fig.1. Dynamics of change of chemical elements after contact of soil to water:
is the dissolved part of elements in water; is the residual contents of elements in soil.

Process of extraction and sorption of scandium considerably differs from REE, but the elements on physical and chemical properties are close REE. From figure it is visible, that scandium practically not extract within water. In water passes no more than 10-15 % Sc, which in due course back (up to 100 %) sorbs within soil. Such behavior Sc as strong комплексообразователя, apparently, is connected to organic substances. The given assumption is confirmed in works published a little bit earlier other authors [1].

The data received by us about extraction of 15 chemical elements from soil Kara-Kalpak and them sorption soil (back) are important in scientific - practical aspect in agro chemistry and hydrochemistry as gives the basis on revision of washout salts from soil.

In works [2, 3, 4] it has been shown, that at transition of river and channel waters there is up to 1.3-50.0 times a pollution irrigation channels waters practically all chemical elements. The researches lead by us on extraction chemical elements water and sorption of soil once again prove their opposites, that in conditions strong salinity of soil many chemical elements are not only in difficultly soluble condition, but also in soluble.

For the lack of the data on other elements we could not capture weight a spectrum of chemical elements.

Further the given question will be investigated by us and attempt to connect behaviors of everyone or group of chemical elements with their physical and chemical properties will be made.

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