

Annotation

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Bulk chemical composition of sod-podzolic soils of Nadsianska plain

Chemical composition of sod-podzolic soils of Nadsianska plain was formed in the process of soil forming under the influence of a number of factors, parent rock and human activities played the main role in this process.

The study of bulk chemical composition of soils in Nadsianska plain has been carried out for the first time and it determines the relevance of the research. Obtained results are of scientific and theoretical as well as practical importance, they are essential for understanding genesis and geography of soils, developing agricultural methods in order to increase soil fertility and its protection.

The aim of the research is to study and analyze bulk chemical composition of soils in Nadsianska plain. To achieve this goal the following objectives were set: to define elemental composition ratio of soils with different genesis and determine its changes in the process of cultivation and erosion degradation.

The object of the research is sod-weakly podzolic soils at water-glacial and moraine deposits of various levels of cultivation and erosion. The subject of the research is content and depthwise distribution of oxides in the soils, indicators of soil cross section differentiation, constitutional water content and changes in the silicate portion of the soil.

To achieve these tasks conventional methods of studying bulk chemical composition of the soils were used. The results were analyzed according to the methods of E.V. Arinushkina and N.B. Myakina.

The studies found that more than 80% by weight of the mineral part of the sod-podzolic soil at water-glacial deposits are silicon oxides SiO_2 and only in highly eroded soils their content in the upper genetic horizon $\text{Eh} + \text{Ie}_{\text{glp}}$ is 67.83 %. Tendency to accumulate SiO_2 was marked in soils under forest cover with depth; its maximum content is characteristic for alluvial horizon Igl . In soils under arable lands its content decreases down the profile.

In depthwise distribution of elements removing sesquioxides R_2O_3 from the top of the profile is observed. In eroded types, due to smaller SiO_2 content, in the upper horizon the number of sesquioxides R_2O_3 , iron, calcium, magnesium and sodium oxides were increased.

It is found that sod-weakly podzolic soils at water-glacial moraine deposits contain more sesquioxides R_2O_3 and are characterized by their removal to the parent rock.

Bulk content of iron, calcium, magnesium, manganese, phosphorus, titanium and sulphur oxides does not exceed 0.5% in the sod-podzolic soils. It is determined that soils contain a small amount of Ca^{2+} and Mg^{2+} and calcium prevails over magnesium everywhere. There are fewer molar ratios in soils under the arable land.

Calculated values of leaching factor indicate that the accumulation of calcium and magnesium oxides relatively to SiO_2 in humus-elluvial horizon of these soils under the forest cover and leaching of calcium, magnesium, potassium and sodium oxides in cultivated soils are noticeable.

Thus, the essential part in the elemental composition of sod-podzolic soils is SiO_2 ; the second components are aluminum and iron sesquioxides R_2O_3 .

Sod-weakly podzolic soils formed on moraine, compared to the soils formed on water-glacial deposits, in eluvial and illuvial horizons contain less SiO_2 and more aluminum and iron sesquioxides R_2O_3 .

Keywords: Nadsianska plain, bulk chemical composition, sod-podzolic soil, profile differentiation.