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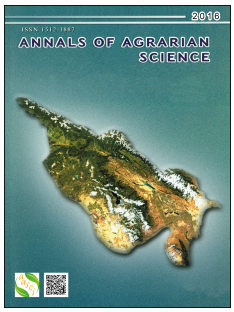

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ELEMENTS OXIDES AS A SOURCE OF ERRORS IN THE GROSS CHEMICAL COMPOSITION OF SOIL AND WAYS TO ELIMINATE THE ERRORS

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A B S T R A C T

Gross chemical composition of soils accepted in the form of oxides of express items and amount of oxides of macro elements equated with 100%. But the form of oxides is artificial and contrary to the actual mineralogy of soils. Errors in the content of the main macro elements nutrients of the solid phase of soils (oxygen) lead to errors in the content of all the rest of the macro elements. The oxygen content is greatly understated in the calcareous soils and clay soils of different genesis, silt soil fractions, as well as the Fe-Mn nodules. This leads to overestimation of the content of the rest of the macro elements. The oxygen content is heavily overstated in soils with natural sulphide and soils contaminated by sulphides: the sulphur content in the soil turns out to be heavily underestimated. The new technique of clarifying of the oxygen content take into account the loss on ignition, which leads to a decrease in all other macro elements in gross composition of soils.

Keywords: Oxygen in the solid phase of soils, Main chemical elements, Silt faction soils, Sulfides, Gross chemical composition, Soil minerals.

Introduction

The gross chemical composition is one of the main agrochemical soil properties. He also required when studying the processes of soil formation and soil contamination.

For a long time the gross chemical composition of the soil is represented in the form customary to oxides of elements. Sum of minerals oxides (usually 8-10) is equal to 100%.

Let us look critically to the form of expression of the gross soil in the form of mineral oxides. The fact is that the form of oxides is largely artificial and contrary to the actual mineralogy of soils.

For example, oxide of silicon SiO_2 is corresponded to the formula only quartz, whereas the composition of alumina-silicate ratio Si: O otherwise, not 1:2, but 1:2.5. A similar situation with aluminum, the formula Al_2O_3 is corresponded only for corundum – a very rare mineral in soils. More frequently soils are consist of aluminum hydroxide: gibbsite $Al(OH)_3$ and boehmite AlOOH [1], in which the ratio of Al: O = 1:3 and 1:2, respectively, not the ratio of Al: O = 1:1.5

The sulfur is form the oxide in the gypsum soils [2], but sulfide is giving an error in the soil gross chemical composition.

There is a disagreement and to Fe_2O_3. This is the chemical formula of hematite, which usually is inherited from rocks, where as in soils in humid climate are formed Fe-hydroxides: goethite, lepidocrocite, feroxyhite with the formula FeOOH [3]. In them the ratio of Fe : O = 1:2 instead of 1:1.5 in hematite. With regard to the CaO, in soils generally "quick lime" is not