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Determination of the composition of trepel of the Novo-Aybesinskoe deposit of the Chuvash Republic

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Abstract

This work presents the results of the quantitative determination of a number of oxides of elements in the samples of trepel from the Novo-Aybesinskoe deposit of the Alaty region of the Chuvash Republic. Calcium (GOST 2642.7-2017), magnesium (GOST 2642.8-2017), aluminum (GOST 2642.4-2016), silicon (GOST 2642.3-2014), phosphorus(V) (GOST 14657.6-96) and iron(III) (GOST 2642.5-2016) oxides were determined by gravimetric, photometric and titrimetric analysis methods. Trepel is an environmentally friendly feed additive successfully used in poultry and livestock farming, so the study of the composition of local trepel will produce a balanced nutrient feed and improve the quality of agricultural products. According to the results of the tests in the chemical composition of the samples of trepel from the Novo-Aybesinskoe deposit found a high content of silicon oxide(IV), which is $59.01 \pm 0.96\%$. While the average content of the other considered oxides of petrogenic elements is in descending order, in %: calcium oxide (7.65 ± 0.07), aluminum oxide (4.09 ± 0.19), iron(III) oxide ($3.06\% \pm 0.38$), magnesium oxide (0.81 ± 0.03) and phosphorus(V) oxide (0.41 ± 0.06). It has been shown that the optimal method for determining the content of calcium and magnesium oxides in trepel is complexometric titration with trilon B in the presence of indicators 1-(2-pyridyl-azo)-2-naphthol and fluorexone with thymolphthalein, respectively; the determination error in all cases does not exceed 2%. Photometric determination of the content of phosphorus(V) oxide in trepel was carried out at a wavelength $\lambda = 630$ nm, and iron(III) oxide at $\lambda = 450$ nm.

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