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# CENTRAL RESIN PHOSPHORITE HYDROCHLORIC ACID DECOMPOSITION PRODUCTS, OBTAINING NPK-FERTILIZERS ON THE BASIS OF UREA AND POTASSIUM CHLORIDE

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**Introduction**

A number of scientific researches on the development of technologies for obtaining fertilizers with nitrogen, phosphorus, potassium and other nutrients on the basis of local raw materials have been organized at a high level in our country and theoretical and practical results have been achieved on the basis of wide-coverage measures on the development of economically effective methods of their application in agriculture. In this regard, it is an important task to create a technology of complex production of new varieties with high efficiency on the basis of Central Red cumin phosphates. Proceeding from this, it was studied to obtain a new type of complex fertilizers on the basis of chlorphosphoric acid porridge, urea and potassium chloride, decomposed in hydrochloric acid thermocentrate obtained from Central Redwood phosphorites.

**MATERIALS AND METHODS**

In laboratory conditions, experiments were conducted on a laboratory device consisting of a tube-glass reactor equipped with a screw mixer controlled by an electric motor. For laboratory work, the Central Rhizome was washed and crushed with burnt phosphocontcentrate (thermocentrate) (composition: R2O5 – 25,71%; Sao – 55,68%; SO2 – 2,83%; MgO – 1,19%; R2O3 – 3,79%; SO3 – 5,01%)with incomplete norms of 31,4% hydrochloric acid for 2,5-30 minutes. When calculating the amount of hydrochloric acid, it was taken as the basis to decompose phosphate, free kaltsium oxide and calcite minerals contained in the thermocouple sample and form monocalciosphate and kaltsium chloride salts. Acid norm was obtained 45, 55, 65 and 75% compared to stexiometry. The temperature was 65-85 os, depending on the acid norm. Hydrogen index with ammonia gas was neutralized until rn=5,0-5,5 in order to prevent the loss of phosphoric oxide when filtering kaltsium chloride in the composition of the chlorphosphorchislated chalk, which was re-produced by thermocouple with hydrochloric acid [1-4]. Neutralized Chalk was filtered twice with water in a ratio of 1: 1 and received phosphocontcentrate. To meet the demand for complex NPK-fertilizers, phosphoconcentrate obtained on the basis of hydrochloric acid and thermoconcentrate was influenced by urea (or 70-72% solution of urea) and potassium chloride.

In all the work on the composition of the resulting NP7-fertilizers, the chemical analysis of phosphorus, potassium, potassium, and chlorine, the determination of moisture content and other forms of moisture content is given in full reference 1-1 AZ.

**Research findings and discussion.**The acid norm is 45% and the ratio of nitrogen, phosphorus and potassium $N:P_2O_5:K_2O=1:1:1$ when in the composition of complex NPK-fertilizer $N_{умум.}$ – 14,66%, $P_2O_{5умум.}$ – 14,66%, $P_2O_{5ўзл.}$ – 7,62%, $K_2O$ – 14,66%, $CaO_{умум.}$ – 20,14% ва $CaO_{ўзл.}$ – 6,10%ni as well as the sum of nutrients ∑npsözl.= 50,08% (table).

Graph

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Chemical composition of complex NPK-fertilizers on the basis of phosphocontcentrate, urea and potassium chloride,%

| $_2O_5$:$K_2O$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| n the acid stexiometric norm is 45% | | | | | | | | | | |
| 1 | 44 | 04 | 0 | 09 | 19 | | 6 | | 18 | 44 | 2 |
| 2 | 78 | 65 | 3 | 78 | 85 | | 18 | 73 | 95 | 56 | 4 |
| 1 | 66 | 37 | 0 | 66 | 23 | | 14 | 07 | 95 | 66 | 3 |
| 7:0,5 | 63 | 36 | 7 | 74 | 32 | | 38 | 23 | 79 | 1 | 0 |
| 1 | 23 | 01 | 2 | 11 | 0 | | 27 | 05 | 63 | 12 | 3 |
| n the acid stexiometric norm is 55% | | | | | | | | | | |
| 1 | 48 | 4 | 3 | 07 | 79 | | 08 | 22 | 26 | 48 | 2 |
| 2 | 97 | 61 | 6 | 97 | 81 | | 81 | 05 | 95 | 93 | 3 |
| 1 | 95 | 6 | 6 | 95 | 69 | | 88 | 05 | 95 | 95 | 7 |
| 7:0,5 | 99 | 67 | 2 | 99 | 14 | | 74 | 81 | 79 | 9 | 0 |
| 1 | 66 | 22 | 4 | 28 | 2 | | 49 | 65 | 71 | 28 | 2 |
| n the acid stexiometric norm is 65% | | | | | | | | | | |
| 1 | 94 | 8 | 0 | 88 | 63 | 1 | 22 | 06 | 07 | 94 | 2 |
| 2 | 26 | 7 | 6 | 26 | 89 | 4 | 45 | 43 | 82 | 62 | 4 |
| 1 | 41 | 7 | 0 | 41 | 10 | 2 | 65 | 28 | 07 | 41 | 3 |
| 7:0,5 | 66 | 9 | 6 | 89 | 60 | 6 | 62 | 63 | 69 | 28 | 4 |
| 1 | 08 | 65 | 3 | 64 | 08 | 9 | 72 | 1 | 76 | 64 | 3 |
| n the acid stexiometric norm is 75% | | | | | | | | | | |
| 1 | 82 | 01 | | 64 | 84 | 1 | 06 | 42 | 69 | 82 | 3 |
| 2 | 49 | 77 | 2 | 49 | 80 | 0 | 7 | 11 | 83 | 09 | 4 |
| 1 | 78 | 87 | 1 | 78 | 94 | 6 | 69 | 07 | 87 | 78 | 3 |
| 7:0,5 | 03 | 18 | 6 | 72 | 22 | 8 | 74 | 8 | 22 | 61 | 3 |
| 1 | 6 | 82 | 7 | 75 | 7 | 4 | 7 | 82 | 07 | 75 | 1 |

When the acid norm is 45%, with an increase in the amount of urea contained in the fertilizer, that is, when the ratio of nitrogen, phosphorus and potassium (N:P2O5:K2O) changes from 1:2:1 to 2:1:1, the degree of decomposition of phosphocontcentrate increases from 50,72 to 53,10%. In addition, all forms of nitrogen nitrogen are also increased accordingly. The ratio of nutrients to acid norm 45% is n:P2O5:K2O when the ratio is 2:1: 1, the phosphorus and kaltsium amounts that the plant absorbs are 5,90% and 4,79% respectively. The amount of phosphorus and kaltsium that the plant absorbs increases from 55 to 75% (when the ratio of N:P2O5:K2O is 2:1:1), respectively, from 7,22 to 9,87% and from 5,76 to 8,28%. The rate of decomposition of thermocouple increases from 64,00 to 84,00%. Effect of potassium chloride on NP-fertilizers obtained by adding urea to phosphocontcentratetirib it was found that the amount of phosphorus and calcium in the plant-containing form in its composition increased by 3-5% only to obtain new types of NPK-fertilizers.

It was also studied that the change in the total phosphorus r2o5 and kaltsium Sao content in complex NPK-fertilizers correlated with the acid norm and the ratio of nutrients N:P2O5:K2O. Data confirm that an increase in the acid norm from 45 to 75% leads to an increase in the total phosphorus R2O5 and a decrease in the total amount of sodium. For example, when the acid norm is 45% N:P2O5:K2O ratio 1:2:1, the total phosphorus content is 20,09% while the total kalts is 27,60%. In the same ratio, when the acid norm is 75%, the total fsfor is 22,64%, while the total amount of kaltsium is 18,06%. In these cases, it is possible to observe an increase in the content of potassium in the fertilizer in the range of 1-2%.

It has been shown that the decomposition of thermocouple in high stexiometric norms of acid and the concentration of kaltsium chloride solution obtained from its filtration is high.

Conclusion. The possibility of obtaining high-efficiency nitrogen-phosphoric-potassium complex fertilizers by decomposing thermocentrate with hydrochloric acid and then double the remaining residue when washing with water, that is, by influencing urea and potassium chloride to phosphocentrate was brought. The resulting complex fertilizers are fully suitable for use in agriculture in terms of chemical composition.

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