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METHODS FOR PERFORMING THE TECHNOLOGY OF OBTAINING NITROGEN, PHOSPHORUS AND POTASSIUM FERTILIZERS BASED ON LOCAL RAW MATERIALS

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Annunciation:
This article briefly tells about the methods of producing nitrogen, phosphorus and potassium fertilizers in the composition by influencing various mineral salts on phosphoconcentrate obtained by decomposition in hydrochloric acid when performing experiments.

Keywords: fertilizer, raw materials, chloride kislata, mass, phosphate, reaction.

One of the main factors in the cultivation of high and high-quality crops in the world is the rational use of mineral fertilizers. Therefore, the optimal supply of Agriculture with mineral fertilizers remains one of the pressing problems. Taking this into account, local phosphorus, nitrogen and potassium are the most necessary nutrients for the plant. The plant takes these elements from the soil. In the soil, the amount of these substances decreases from year to year, the fertility of the soil decreases, and this negatively affects the yield of the crop. To increase the fertility of the soil, it is necessary to provide the earth with sufficient mineral fertilizers. It consists in creating a technology for the production of nitrogen, phosphorus and potassium fertilizers in the composition by affecting various mineral salts to the phosphoconcentrate obtained by breaking down these homashyos (thermoconcentrate)in hydrochloric acid.

To obtain samples of complex fertilizers, the central resin phosphorites were decomposed with hydrochloric acid. The amount of hydrochloric acid needed to break down calciftorapatite-Ca5 (PO4) 3F is determined by the following formula:

In this place $m_{dast.\,fos.}$ – initial phosphate raw material mass, g;

$w(Ca_5(PO_4)_3F)$ – in phosphate raw materials Ca5(PO4)3F mass fraction of, g;

N_{HCl} - hydrochloric acid norm , %;

C_{HCl} - hydrochloric acid concentration , %;

0,507 –HCIni Ca5(PO4)3F ratio to. According to the following reaction:2Ca5(PO4)3F + 14HCI = 3Ca(H2PO4)2 + 7CaCI2 + 2HF (1)

To break down the calcite Mineral, the hydrochloric acid mass is determined by the following formula: $m_{HCl} = \frac{m_{dast.\,fos.} \cdot w(CaCO_3) \cdot 0,73 \cdot N_{HCl}}{C_{HCl}}$

Bunda, $m_{dast.\,fos.}$ – initial phosphate raw material mass.

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$w(CaCO_3)$ – in phosphate raw materials CaCO3 mass fraction,

N_{HCl} - hydrochloric acid norm , %;

C_{HCl} - hydrochloric acid concentration , %;
0,73 – HCIni CaCO3 ga nisbati. Quyidagi reaksiya bo'yicha:
CaCO3 + 2HCI = CaCI2 + CO2 +H2O (2)

To break down the free Cao contained in the thermoconcentrate, the hydrochloric acid mass is determined by the following formula: $m_{HCl} = \frac{m_{dast.fos.} \cdot w(CaO) \cdot 1{,}30 \cdot N_{HCl}}{C_{HCl}}$

Bu yerda, $m_{dast.fos.}$ – initial phosphate raw material mass, g;

$w(CaO)$ – in phosphate raw materials CaO mass fraction, g;

N_{HCl} - hydrochloric acid norm , %;

C_{HCl} - hydrochloric acid concentration , %; ;
1,30 – HCIni CaO ratio to. According to the following reaction:
CaO + 2HCI = CaCI2 + H2O (3)
When calculating the amount of hydrochloric acid, the formation of monocalciphosphate and calcium chloride salts was taken as a basis, breaking down the minerals phosphate, free calcium oxide and calcite contained in the thermoconcentrate. (1st, 2nd and 3rd reaction). The acidity norm was taken 45, 55, 65 and 75% compared to stoichiometry.
The degree of decomposition of phosphate raw materials is determined by the following formula: Kr= (P2O5 uzl./ P2a5umum.)·100%,
In this case, P2O5 uzl. - Plant-absorbing form of P2O5, %;
P2a5umum. - Total amount of P2O5,%.
The decomposition of phosphate raw materials with hydrochloric acid was carried out at a temperature of 65-85 0C and in a tubular glass reactor for 20-30 minutes with constant stirring. To decompose a certain amount of hydrochloric acid phosphate raw materials, 4-6 minutes were completely spent on the passage. In this case, phosphate raw materials with acid interact intensively in the reactor. Foaming was not observed due to the very low carbonate content of the thermoconcentrate. After the decomposition of phosphate raw materials, the calcium chloride contained in chlorphosforkislotali porridge was filtered out. To prevent the loss of phosphorus oxide in filtration, the hydrogen indicator with ammonia gas was neutralized until pH=5.0-5.5. To the neutralized chlorphosforkislotated porridge, calcium chloride was filtered by diluting it with water in a 1:1 ratio to extract it. The filtrate, which was dressing during the first filtration process, was used as a raw material to obtain chlorate-based defoliants.

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The calcium chloride contained in the resulting phosphoconcentrate was repulpated and filtered with water in a 1:1 ratio for a more clean wash (this is the second filtration). In the second filtration process, the dressing filtrate is applied to filter calcium chloride from chlorphosforkislite porridge, which is the new dressing. After the second filtration, a certain amount of ammonium nitrate, urea solution was affected by the phosphoconcentrate obtained. As a result of drying the resulting product, complex NP-fertilizers with nutrients in different proportions were obtained. To obtain NPK-fertilizers, however, NP-fertilizers were affected by a certain amount of potassium chloride produced in the "peasant potash plant" AJ.

Complex fertilizers-phosphate raw materials (thermoconcentrate) were obtained in the presence of an absorption liquid, ammonium nitrate, urea and potassium chloride in chlorphosphoric porridge, decomposed with hydrochloric acid. Under these conditions, the process of decomposition of phosphate raw materials foaming was not observed.

In the study of the kinetics of decomposition of phosphate raw materials with hydrochloric acid, n-butanol alcohol was used to stop the reaction. In doing so, it stops the reaction of the remaining hydrochloric acid and the resulting phosphoric acid with phosphate raw materials [37; S.47]. From experiments it was found that in practice, the reaction stops completely when 2.5 khajm n-butanol alcohol is added to 1 khajm chlorphosforkislotali porridge. After the complete cessation of the process, chlorphosforkislota porridge is separated into the solid and liquid phase by a filtering path. Wet residue FK:

The degree of decomposition of phosphate raw materials was determined by the following formula:

$$\gamma = 100 - \frac{m_{1P_2O_{5umumiy}} - m_{P_2O_{5suvda'er..}}}{m_{P_2O_{5umumiy}}} \cdot 100$$

$m_{1P_2O_{5umumiy}}$ - total weight of P2O5 in wet residue, g;

$m_{P_2O_{5suvdaer.}}$ - mass of P2O5 in water-soluble form in wet residue

$m_{P_2O_{5umumiy}}$ - the total weight of P2O5 in the sample.

The decomposition time of phosphate raw materials is 2.5-30 minutes. The norm of hydrochloric acid is 45 - 75% compared to stoichiometry. So the methods of performing experiments consist of a lot of information.

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