ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 7, Issue 4 , April 2020

Determination of Optimical Technological Parameters of Tybegatan Deposition, Fluatation Fuel Flow

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ABSTRACT: This article explores ways to improve the process of concentrating the potassium fertilizer plant.Due to the fact that the production was manufactured according to the requirements of the enterprise, the composition of the Tyubegatan raw materials was studied and these raw materials were used for production.Data were calculated based on the quantitative scheme shown in Dehkanabad Potash Fertilizer Plant's enrichment plant project.

KEY WORDS: Gaurdak-Tyubegatan, white-headed, gallurgy, silvinite, limestone, hobos, solid phase, fluid phase.

I. INTRODUCTION

Gaurdak-Tyubegatan, Akbash, Cheurkalgen, Chekar, Kaypantu-Baysurkhan, Kantiu, Gulgan, Kyzylmar, Baybi-icon, Surakhan.According to NP Petrov, the halogenic pharmacokinetics of Gaurdak is subdivided into three main horizons: low angidritis, medium saline, high gypsangidite [3].

The lower horizon is a layer of limestone interchangeable limestone and gypsangidite, containing sulfur in the nests.Sulfuric limestone layers are transferred to marble angrite.Sulfuric lenses of 3-5m thickness appeared in the upper part of the anhydride horizontal 30-35m.

The second horizontally salt is divided into several layers with a capacity of 300-350m.In addition to potassium salts it is placed in a layer of red salt on the bottom pack of rock salt.The amount of KCl in silvite can range from 2-4 to 8% [4].

The potassium-containing bulkhead of about 24m of rock salt is at the top.The sac consists of the layers of silvinite and carnallite-silvinite, with a layer thickness of 1.5 to 8m with KCl content of about 25-39%.Three classes of potassium salts are located above the rock salt layer, with a thickness of 1.5-4m high and low grade silvinite and a thickness of 30 to 100m0, with some cornite formation occurring 14-34% KCl [3].
Thus, in the Gaurdak district, the capacity of high-halogen pharmaceuticals is 300-350m.The Tyubegatan deposit is located in this tectonic axis 35-40 km [5].

According to NP Petrov, the bulk of the Tyubegatan halogenic drug starts with sulfur dioxide, with a high salt content (290-295m).The upper part of the horizon (110-120m) consists of one-time rock salt with three horizons of potassium salts.At the base is a sub-layer of silvinite (1–1.5m), with KCl content of up to 20%.This layer corresponds to the second Gaurdane layer of potassium salts.Then there is intermediate rock salt (33-63m), in some places silvite and carnallite.Above this layer is a layer of silicate, with KCl content of about 17-20%.There are 14 origins of halogenic rocks from Gaurdak and Tyubegatan to the eastern and southeastern regions: forty, Scythian, Karagyz, Karayagach, Baymashkalak, Bazartyube, Auddjeykan, Oczbulok, Aktau, Khodzhankin and others.Potassium salts are associated with known salts.

The Tyubegatan potassium mine is located 35km north of the GaurdakSulfur Plant and 50km north of Dekhkanabad district Surkhandaryaregion,and the mine is 150km southwest of Kitab Station [5].

II. THE SYSTEM OF SIGNIFICANCE

Potash Fertilizer Plant is looking for ways to improve the process of concentrate concentrate. A technological scheme for the production of potassium fertilizers by flotation method from the Tyubegatan deposit is developed.Dekhkanabad Potassium Fertilizers Plant Flotation Unit StudyTheTyubegatan deposit is used to obtain the optimal technology parameters for the production of potassium fertilizers and flotation methods.

III. THE SYSTEM OF SIGNIFICANCE

At present, the majority of factories use flotation.However, the higher the insoluble residual content in the ore, the higher the reagents consumption and the lower the potassium excretion in the finished product.In addition, there were cases when potassium chloride obtained by flotation method increased the insoluble impurities and increased the viscosity of the product.It should be noted that the adhesion to certain methods has not yielded any positive results.
The sludge does not cause such difficulties when processing the silvinites by gallurgy method.It is known that the processing of silvinite with more than 30% insoluble additives was profitable.

Currently, the flotation of the coarse-grained material is assimilated, and the flotation method can produce some of the material in the form of large material. Some galleries produce potassium chloride particles with a size of 3.33 mm. However, switching from 0.3mm to 1.17mm in the galleries will reduce the crystallization capacity by 50-75%.
Given the disadvantages of the second method, the melting-crystallization cycle is expected for the new combination device. In such factories, 5 to 20% of the product is produced by gallurgy method.
In the combined scheme, the primary ore is weighed in dry form and then added to the mix when it is mixed with the rotating brine. The resulting suspension is classified by size and the largest fraction is sent to flotation, followed by cleaning, and the liquid phase of the classifier enters the hydroseparator where the saline particles are removed from the sludge. From the hydraulic separator, the slurry pulp is sent to thicken, from which the liquid phase is returned to the classifier, and the thickened slurry pulp is sent to the waste collector.

IV. METHODOLOGY

In this article, we have studied the composition of Tyubegatan raw materials as the production is manufactured according to the needs of the enterprise and we will use this raw material for the production.
In the Tyubegatan anticline, layers of rock salt with potassium salts on three horizons were uncovered.
Two groups of salt mines have been opened in Uzbekistan:
1) Gugurttog-Tyubegatan, Akbash, Cherak.
2) Kaypantau - Baybakhur Khan, Kantau, Tauhan, Kyzylmozor, Boybichakon.
The thickness of the upper Jurassic halogen formation in the fossil zone is between 700 and 800 m.The share of salt is 300-350m.The structure of the Tyubegatan halogen layer is examined as an example of a base well located in the central part of the deposit.The Tyubegatan layer consists of three horizons.1).At the depth of 117.7 m, about 1m thick: contains 36.9% KSl: silvinite, in the form of pale crystals, is composed of crystals of light pink halite (NaCl).
2) Thick 7.9 m thick.It is coated with pink and orange pink halite (NaCl), which contains intermediate dark purple and carnallite crystals.The mean content of KSl is 7.86%.There are two layers rich in potassium salts on the horizon.
3) Depending on the depth of 236.7-225m. Three layers of potassium salts are recorded here.
Halogen Formation of Fertilizer is divided into three main heights: low-angidritis, medium-saline, high-gypsum-anhydrite.

The lower elevation is replaced by a layer of limestone and a gypsum-anhydride layer, which attaches sulfur flour.Sulfur-rich limestone is replaced by marble-type dioxide.A lens of gray rock salt appeared at the top of the anhydrite at a height of 30… 35 m.Salt II height of 300… 350 m is divided into several thicknesses by Petrov.The bottom pack of the rock salt, where potassium salts are exposed, is placed in the thick of pink salt.The amount of KCl in silvite varies from 2… 4 to 8%.Above, the layer consists of two layers of silvinite and carnallite-silvinite with a thickness of 1.5 to 8 m and KCl 25 to 30%.About 24 m thick, mainly salt pink and orange pink rock salt.The third layer of potassium salts of 1.5… 4 m thick, between 30 and 100 m rich and sparse silvinite and rock salt exchange, is located above the rock salt layer;In some areas, carnallite is formed.The KCl content in the layer is 14… 34%.

The structure of Tyubegatan consists of three folds: Kursantosh, Karachagat and Tyubegatan with exactly asymmetrical structure.In the northwestern part of the deposit, limestone is deposited on the surface, where the gypsum-anhydride is deposited.Above it is a halogen layer (300… 350 m) containing three layers of potassium salts.

The thickness of the salt layer increases along the southwest. The coefficient of salt content of the rock layer on the entire surface of this open pit is from 29 to 99.5% (average 90%) of the halogen layer with salt.

IV. EXPERIMENTAL RESULTS

The dimensions given in this work and their functions.
Data for compiling the methodology were obtained based on the quantitative scheme shown in Dehkanabad Potash Fertilizer Plant Project.
1) Calculation of the mass fraction of potassium chloride in the solid phase cake concentration
1. Calculate the mass fraction of absolute dry potassium chloride concentration at KCl natural concentration of 1% moisture:

$$\beta^{KCl}_{solid.conc} = \frac{\beta^{KCl}_{nat}}{1-\frac{W_{nat}}{100}} = \frac{95.1}{1-\frac{1}{100}} = \frac{95.1}{1-0.01} = \frac{95.1}{0.99} = 96.06\ \%$$

$$\beta^{HO}_{solid.} = \frac{\beta^{HO}_{nat}}{1-\frac{W_{nat}}{100}} = \frac{0.7}{1-0.01} = \frac{0.7}{0.99} = 0.71\ \%$$

2) We calculate the mass fraction of KSI and NO in solid phase concentrate with 7% water content:
1. Fabric weight with 7% moisture content:

$$P^{x\theta}_{M} = \frac{W^{x\theta}_{grudge}\cdot 100}{100-\varepsilon_{ice}} = \frac{7\cdot 100}{100-31{,}9} = 10{,}28$$

2. Massofclothsalts:

$$P^{x\theta}_{ice.M} = P^{x\theta}_{M} - W^{x\theta}_{grudge} = 10{,}28 - 7 = 3{,}28$$

3. weight of dry waste cake:

$$P^{x\theta}_{dry} = 100 - W^{x\theta}_{grudge} = 100 - 7 = 93$$

4. Weight of waste cake in solid phase:

$$P^{x\theta}_{solid} = P^{x\theta}_{dry} - P^{x\theta}_{ice.M} = 93 - 3{,}28 = 89{,}72$$

or $P^{x\theta}_{solid} = 100 - P^{x\theta}_{M} = 100 - 10{,}28 = 89{,}72$

5. Find the mass fraction of KSI in the solid phase cake by the following formula:

$$\theta^{KCl}_{catxa} = \frac{P^{x\theta}_{dry}\cdot\theta^{KCl}_{dry.x\theta} - P^{x\theta}_{ice.M}\cdot\beta^{KCl}_{M}}{P^{x\theta}_{cat}} = \frac{3{,}8\cdot 93 - 3{,}28\cdot 37{,}62}{89{,}72} = 2{,}56\%$$

6. Find the fraction of insoluble residual mass in solid phase cake by the following formula:

$$\theta^{KCl}_{cat.x\theta} = \frac{P^{x\theta}_{dry}\cdot\theta^{HO}_{dry.x\theta}}{P^{x\theta}_{cat}} = \frac{1{,}77\cdot 93}{89{,}72} = 1{,}83\%$$

1. The concentration of salts cake in the dilution solution depends on the moisture content of the final product.
each product in the circulating solution:

$$\gamma^{x-m}_{ice.M} = \gamma^{x-m}_{cat}\cdot\frac{P^{x-m}_{ice.M}}{P^{x-m}_{\kappa a m}} = \gamma^{x-m}_{cat}\cdot\frac{3{,}04}{90{,}46} = 0{,}033606\gamma^{\kappa-m}_{cat}$$

2. Salt cake in the waste solution depends on the moisture content of the waste:

$$\gamma^{x.\theta}_{ice.M} = \gamma^{x.\theta}_{cat}\cdot\frac{P^{x.\theta}_{ice.M}}{P^{x.\theta}_{cat}} = \gamma^{x.\theta}_{cat}\cdot\frac{3{,}28}{89{,}72} = 0{,}036558\gamma^{x\theta}_{\kappa a m}$$

3. The amount of cloth salts in a slime product depends on the content of the sludge from which it is released:

$$\gamma^{slime}_{ice} = R_{\text{шл}}\cdot\frac{\varepsilon_{ice}}{100}\cdot\gamma^{slime}_{cat} = 2\cdot\frac{31{,}9}{100}\cdot\gamma^{slime}_{cat} = 0{,}638\gamma^{slime}_{cat}$$

1. Determine the total output of cake concentrate:

$$\gamma^{\kappa-m} = \gamma^{\kappa-m}_{cat} + \gamma^{\kappa-m}_{ice} = \gamma^{\kappa-m}_{cat} + \gamma^{\kappa-m}_{cat}\cdot 0{,}033606 = \gamma^{\kappa-m}_{cat}(1+0{,}033606) = 1{,}033606\gamma^{\kappa-m}_{cat}$$

2. Determine the total output of the cake:

$$\gamma^{x\theta} = \gamma^{x\theta}_{cat} + \gamma^{x\theta}_{ice} = \gamma^{x\theta}_{cat} + \gamma^{x\theta}_{cat}\cdot 0{,}036558 = \gamma^{x\theta}_{cat}(1+0{,}036558) = 1{,}033606\gamma^{x\theta}_{\kappa a m}$$

3. Determine the total output of cuttings:

$$\gamma^{slime} = \gamma^{slime}_{cat} + \gamma^{slime}_{ice} = \gamma^{slime}_{cat} + \gamma^{slime}_{cat}\cdot 0{,}638 = \gamma^{slime}_{cat}(1+0{,}638) = 1{,}638\gamma^{slime}_{cat}$$

4. Balance equation according to the obtained values of the output of the enrichment product will look as follows:

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 7, Issue 4 , April 2020

$$1{,}033606\gamma_{x\varepsilon}^{\kappa-m}+1{,}036558\gamma_{cat}^{\kappa-m}+1{,}638\gamma_{x\varepsilon}^{slime}=100$$

6) Let's create a balanced equation for the underlying sediment:

$$\beta_{cat.\kappa-m}^{HO}\cdot\gamma_{\kappa am}^{\kappa-m}+\theta_{cat.x\varepsilon.}^{HO}\gamma_{cat}^{x\varepsilon}+\theta_{шл.x\varepsilon.}^{HO}\gamma_{cat}^{шл}=100\cdot\alpha^{HO}$$

$$0{,}73\gamma_{cat}^{\kappa-m}+1{,}83\gamma_{cat}^{x\varepsilon}+39{,}0\gamma_{cat}^{шл}=100\cdot 3{,}25=325$$

7).Let's create a balanced equation for KSI:

Dimensions: with ore content; $100\cdot\alpha^{KCl}=100\cdot 31.93=3193$;

Consumption: a) With concentrate cake:

$$\beta_{cat.conc}^{KCl}\cdot\gamma_{cat}^{\kappa-m}+\gamma_{ice}^{\kappa-m}\cdot\beta_{M}^{KCl}=\beta_{cat.conc}^{KCl}\cdot\gamma_{cat}^{\kappa-m}+\gamma_{cat}^{\kappa-m}\cdot 0{,}033606\cdot\beta_{M}^{KCl}=$$

$$=98{,}02\cdot\gamma_{cat}^{\kappa-m}+\gamma_{cat}^{\kappa-m}\cdot 0{,}033606\cdot$$

$$\cdot 37{,}62=\gamma_{cat}^{\kappa-m}(98{,}02+0{,}033606\cdot 37{,}62)=99{,}28426\gamma_{cat}^{\kappa-m}$$

b) with waste cake:

$$\theta_{\kappa am.x\varepsilon}^{KCl}\cdot\gamma_{\kappa am}^{x\varepsilon}+\gamma_{mуз}^{x\varepsilon}\cdot\beta_{M}^{KCl}=\theta_{\kappa am.x\varepsilon}^{KCl}\cdot\gamma_{\kappa am}^{x\varepsilon}+\gamma_{\kappa am}^{x\varepsilon}\cdot 0.036558=$$

$$=\gamma_{cat}^{x\varepsilon}\cdot(2{,}56+0{,}036558\cdot 37{,}62)=3{,}93531\gamma_{шл}^{x\varepsilon}$$

c) withsludge:

$$\theta_{cat.slime}^{KCl}\cdot\gamma_{cat}^{шл}+\gamma_{icej.i;loki}^{шл}\cdot\beta_{M}^{KCl}=10\cdot\gamma_{cat}^{slime}+0{,}638\gamma_{cat}^{slime}\cdot 37{,}62=$$

$$=\gamma_{cat}^{slime}\cdot(10{,}5+0{,}638\cdot 37{,}62)=34{,}50156\gamma_{cat}^{slime}$$

d) Balance equation according to the obtained values of the output of the enrichment product looks as follows:

$$99{,}28246\cdot\gamma_{cat}^{\kappa-m}+3{,}93531\gamma_{cat}^{x\varepsilon}+34{,}50156\gamma_{cat}^{slime}=3193$$

8) Construct three equations for three uncertainties:

$$\gamma_{cat}^{\kappa-m};\quad\gamma_{cat}^{x\varepsilon};\quad\gamma_{cat}^{slime}$$

$$\begin{cases}1{,}033606\gamma_{cat}^{\kappa-m}+1{,}036558\gamma_{cat}^{x\varepsilon}+1{,}638\gamma_{cat}^{шл}=100\\0{,}73\gamma_{cat}^{\kappa-m}+1{,}83\gamma_{cat}^{x\varepsilon}+39{,}0\gamma_{cat}^{шл}=325\\99{,}28426\gamma_{cat}^{\kappa-m}+3{,}93531\gamma_{cat}^{x\varepsilon}+34{,}50156\gamma_{cat}^{slime}=3193\end{cases}$$

We can calculate this system by a matrix method:

A) We can calculate this system by a matrix method:

1,033606	1,036558	1,638	1,033606	1,036558
0,73	1,83	39,0	0,73	1,83
99,28426	3,93531	34,50156	99,28426	3,93531

Working out of the common matrix:

B) Our matrix structure for the concentrate:

100	1,036558	1,638	100	1,036558
325	1,83	39,0	325	1,83
3193	3,93531	34,50156	3193	3,93531

Matrix solution:

$$\gamma_{cat}^{\kappa-m}=\frac{100946{,}419495}{3601{,}25686275}=28{,}03088$$

$$\gamma_{ice}^{\kappa-m}=\gamma_{cat}^{\kappa-m}\cdot 0{,}033606=28{,}03088\cdot 0{,}033606=0{,}942$$

$$\gamma^{\kappa-m}=\gamma_{cat}^{\kappa-m}+\gamma_{ice}^{\kappa-m}=28{,}03088+0{,}942=2897$$

The concentrate output for 100 tonnes of ore is 28.97 tonnes.

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 7, Issue 4 , April 2020

C) Let's create a matrix for waste:

1,033606	100	1,638	1,033606	100
0,73	325	39,0	0,73	325
99,28426	3193	34,50156	99,28426	3193

Matrix solution:

$$\gamma_{cat}^{xe} = \frac{218531{,}99908}{360125686275} = 60{,}682147$$

$$\gamma_{ice}^{xe} = \gamma_{cat}^{xe} \cdot 0{,}036558 = 2{,}2184179 \cdot 0{,}036558 = 2{,}22$$

$$\gamma^{xe} = \gamma_{кам}^{xe} + \gamma_{муз}^{xe} = 60{,}68 + 2{,}22 = 62{,}90$$

Output of 100 tons is 62.9 tons.

D) Create the matrix for the slime:

1,033606	1,036558	100	1,033606	1,036558
0,73	1,83	325	0,73	1,83
99,28426	3,93531	3193	99,28426	3,93531

Matrix solution:

$$\gamma_{кам}^{шл} = \frac{17866{,}77015}{3601{,}25686275} = 4{,}961259$$

$$\gamma_{муз}^{шл} = \gamma_{кам}^{шл} \cdot 0{,}638 = 4{,}961259 \cdot 0{,}638 = 3{,}17$$

$$\gamma^{шл} = \gamma_{кам}^{шл} + \gamma_{муз}^{шл} = 4{,}96 + 3{,}17 = 8{,}13$$

Sludge output for 100 tonnes of ore is 8.13 tonnes.

Checking Outgoing Product:

$$\gamma^{к-м} + \gamma^{xe} + \gamma^{шл} = 100 \quad 28{,}97 + 62{,}90 + 8{,}13 = 100$$

9) Calculation of KSI production in finished product and calculation of potassium chloride loss in waste products and sludge:

A) Decomposition of potassium chloride in concentrate:

$$\varepsilon_{KCl}^{к-м} = \varepsilon_{KCl}^{cat.к-м} + \varepsilon_{KCl}^{ice.к-м}$$

$$\varepsilon_{KCl}^{кам.к-м} = \frac{\gamma_{к-м}^{cat.} \cdot \beta_{cat}^{KCl}}{\alpha^{KCl}} = \frac{28{,}03 \cdot 98{,}02}{31{,}93} = 86{,}05\%$$

$$\varepsilon_{KCl}^{ice.к-м} = \frac{\gamma_{к-м}^{cat.} \cdot \beta_{M}^{KCl}}{\alpha^{KCl}} = \frac{0{,}94 \cdot 37{,}62}{31{,}93} = 1{,}11\%$$

$$\varepsilon_{KCl}^{к-м} = \varepsilon_{KCl}^{cat.к-м} + \varepsilon_{KCl}^{ice.к-м} = 86{,}05 + 1{,}11 = 87{,}16\ \%$$

B) Calculation of loss of potassium chloride in waste:

$$\varepsilon_{KCl}^{w} = \varepsilon_{KCl}^{cat.w} + \varepsilon_{KCl}^{ice.w}; \quad \varepsilon_{KCl}^{w.cat.} = \frac{\theta_{cat.w}^{KCl} \cdot \gamma_{w}^{cat}}{\alpha^{KCl}} = \frac{2{,}56 \cdot 60{,}68}{31{,}93} = 4{,}86\%$$

$$\varepsilon_{ice}^{w} = \frac{\beta_{м}^{KCl} \cdot \gamma_{ice}^{w}}{\alpha^{KCl}} = \frac{2{,}22 \cdot 37{,}62}{31{,}93} = 2{,}62\%$$

$$\varepsilon_{KCl}^{w} = \varepsilon_{KCl}^{cat.w} + \varepsilon_{KCl}^{ice.w} = 4{,}86 + 2{,}62 = 7{,}48\%$$

$$\varepsilon_{KCl}^{w} = \frac{\theta_{cat.w}^{KCl} \cdot \gamma^{xe}}{\alpha^{KCl}} = \frac{62{,}9 \cdot 3{,}8}{31{,}93} = 7{,}48$$

ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 7, Issue 4 , April 2020

B) Calculation of KCI loss with sludge:

$$\varepsilon_{KCl}^{slime.cat.} = \frac{\theta_{cat.slime}^{KCl} \cdot \gamma_{slime}^{cat}}{\alpha^{KCl}} = \frac{4{,}96 \cdot 10{,}5}{31{,}93} = 1{,}631$$

$$\varepsilon_{KCl}^{ice.slime.} = \frac{\beta_{м}^{KCl} \cdot \gamma_{ice}^{slime}}{\alpha^{KCl}} = 3{,}73$$

$$\varepsilon_{KCl}^{slime} = \varepsilon_{KCl}^{slime.cat} + \varepsilon_{KCl}^{ice.slime} = 1{,}63 + 3{,}73 = 5{,}36\%$$

Divorce amount check:

$$\varepsilon_{KCl}^{slime} + \varepsilon_{KCl}^{wh} + \varepsilon_{KCl}^{к-m} = 100; \quad 5{,}36 + 7{,}48 + 87{,}16 = 100$$

Determination of dry KCI for cuttings:

$$\theta_{solid}^{KCl} = \frac{\varepsilon_{KCl}^{slime.} + \alpha^{KCl}}{\gamma^{slime}} = \frac{5{,}36 \cdot 31{,}93}{8{,}13} = 21{,}05\%$$

10) Calculation of NO removal from enrichment product:

1. $$\varepsilon_{к-m}^{HO} = \frac{\gamma^{к-m} \cdot \theta_{курук}^{HO}}{\alpha^{HO}} = \frac{28{,}97 \cdot 0{,}71}{3{,}25} = 6{,}33\%$$

2. $$\varepsilon_{хв}^{HO} = \frac{\gamma^{хв} \cdot \theta_{курук.хв}^{HO}}{\alpha^{HO}} = \frac{62{,}9 \cdot 1{,}77}{3{,}25} = 34{,}26\%$$

3. Composition of sludge:

$$\varepsilon_{slime}^{HO} = 100 - \varepsilon_{к-m}^{HO} - \varepsilon_{w}^{HO} = 100 - 6{,}33 - 34{,}26 = 59{,}41\%$$

4. $$\theta_{w.solid}^{HO} = \frac{\varepsilon_{slime}^{HO} \cdot \alpha^{HO}}{\gamma^{slime}} = \frac{59{,}41 \cdot 3{,}25}{8{,}13} = 23{,}75\%$$

11) Material balance sheet:

Products	ExitT, %	Mass fraction%		Divorce	
		KCI	E,K	KCI	E,K
Access: Mdan	100	31,93	3,25	100	100
Delivery					
The concentrate	28,97	96,06	0,71	87,16	6.33
The solid phase	28.03	98,02	0,73	86,05	
The liquid phase	0,94	37,62		1,11	
Hosts	62,9	3,8		7,48	
The solid phase	60,68	2,56	1,77	4,86	34,26
The liquid phase	2,22	37,62		2,62	
Sludge	8,13	21,05	1,83	5,36	
The solid phase	4,96	10,5	23,75	1,63	
The liquid phase	3,17	37,62	39,0	3,73	59,41
Total:	100	31,93	3,25	100	100

V. CONCLUSION AND FUTURE WORK

The structure of Tyubegatan consists of three folds: Kursantosh, Qorachagat and Tyubegatan with exactly asymmetrical structure. The raw material was selected from this deposit and the mass fraction of potassium chloride in the solid phase cake concentration was calculated. The calculations resulted in the determination of concentrate, solid phase, fluid phase, hotspots and sludge. In the future, we were looking for ways to apply these calculations to other potassium deposits.

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ISSN: 2350-0328
International Journal of Advanced Research in Science, Engineering and Technology
Vol. 7, Issue 4 , April 2020

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