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Use of Local Reagents for Polymetallic Ores

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ABSTRACT. In the article, the semi-functional reagent and NSH reagent were added as an addition to the fluoreagents in the experiments on the basis of experience. Experiments revealed the consumption of polymetallic ores and additional reagents. The results obtained led to such a conclusion: when the semi-functional reagent used as the Collector reagent and the NSH reagent were used, the quality of the concentrate separated from the waste was improved, and when the consumption of the NSH reagent increased, the percentage of copper and iron separation was increased.

KEY WORDS: copper, flotation, crushing, reagent, concentrate, product, reagent, shredding, an experience.

I. INTRODUCTION

In laboratory tests on the flotation obogatimost usually take a sample from 100 grams up to 2-3 kg, often 0,5-1 kg. to avoid oscillations in the concentration of metals in the source material for each experiment, it is necessary to retain the relationship between the diameter of the largest grains and the weight of the sample. For non-ferrous metals in the sample weight 0.5-1 particle size of the material, respectively, should be no higher than 1.5-3 mm. When tested use tap water that does not contain iron salts, which appear at oxidation of metal water pipes, or natural water factory.
Grinding ore for flotation experiments made in the mills in the aquatic environment at a ratio W:T:W=1:0,5:6. Flotation tests laboratory flotation machines with volume of the chamber 8,0; 3,0; 0,5; 1,5; 0,25; 0,2; 11.
The volume of the chamber is chosen depending on induce flotation DK product and the percentage of solids in the operation.

II. SIGNIFICANCE OF THE SYSTEM

Calculation of the volume of the chamber of the flotation is calculated by the formula:

$$V = Q\left(R + \frac{1}{\delta}\right)\text{cm}^3$$

where the
V - volume of the chamber, cm3
Q - hanging samples, gr.
R - - theratioW:T
δ - - the weight of sample, g/cm3

Before loading the car washed, turn on the motor, close the tube, inlet air, stir the slurry in the receiver, after which it is poured in a slot machine, where is the mixing. If on the bottom left a layer of deposited material, then add a small amount of water and poured it into the machine.
In the car added such a quantity of water to ensure the free circulation of the pulp from the chamber for mixing in a pyramidal cell.

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Then add in a certain order the reagents needed time stirred and let in the air. If the level was low, in the car, water was added in such an amount that the stroke, removing the foam was the pulp level. In the process of removing the foam from it enjoys a significant amount of water, and the pulp level falls. To maintain a constant level of added water having the same alkalinity as the pulp at the beginning of the flotation. During the experiment several times to wash away caked on the walls and other parts of the camera foam.
The study obtained samples from Chulmakansky ore (Copper, molybdenum) and slag Almalyk copper smelter and the copper presented in the form of sulfide inclusions with low content of metallic copper. The chemical composition of Converter slag, %: 2-4 copper, 20-25 silicon, sulphur 3-5, 45-52 iron.
Used reagents:
For all flotation reagents are the following: selectivity of action, the standard of quality, cheapness and nedvizimostj, ease of use (the storage stability, easy solubility in water, no unpleasant smell, etc.).
Directional change of the surface energy of the phase separation under the action of flotation reagents is achieved as a result of their chemical interactions in the volume of the liquid phase and adsorption on the surface of the possibility of occurrence of which depends on the nature and condition of the interfacial surface and reagents in the pulp.
In experiments, reagents were used:
As the collector used the SS and butyl xanthate , which is a sulfhydryl collector in flotation of ores of nonferrous and precious metals. (30-300 g/t of ore). As a Supplement to butyl xanthate was used 1% solution of PS-1, which is a waste Creamery. The first monolayer of xanthate fixed to the surface flatweave sulfide mineral, is hammarbyhamnen and is sulfidecontaining.

III. METHODOLOGY

As the foaming agent used T-92, which is a synthetic reagent. As the additive used, waste oil refinery 1% solution of PS-1. Foaming agents have a significant influence on the particle size of bubbles in flotation machine, the speed of their ascent and the air content in the pulp, the stability of the foam and adhesion of particles to bubbles.
The reagents were fed in different proportions.
The first series of experiments , 9 batches of 1 kg was set using a gatherer of PS together to the xanthate.
The second series of experiments, 9 batches of 1 kg were put on the consumption of foaming agent NS-1 and-1.
During the experiment the foam was collected in a porcelain Cup. After settling, excess water was drained, and the solid was dried and weighed on an analytical balance. The resulting products (the main and control concentrates, and the tails of the original sample) was subjected to chemical analysis by certain methods.
Preparation and filing of reagents
For researches were prepared with 1 percent solutions of PS1 and NSH-1 and AT-1. For this purpose, a heat-resistant glass with a volume of 1 liter with a stirrer. Using the graduated cylinder, was fed SS,NSH-1 and AT-1. In addition, there were used butyl xanthate, T-92, lime.
Studied the dependence of the copper content and molibdena in concentrate from the expense of new, local and cheap collector of PS and NS and foam ON-1.

The experiences of the 9 samples were performed in open loop and specified expenses of the PS on the minerals of copper in the copper slag.
The second series of experiments from seven samples was also carried out in open loop and specify the cost of NSH, as a blowing agent for polymetallic ore and copper slag.
The results of experiments shown in the figures and table 1; 2;

Table 1.Dependence of the degree of copper content during flotation on the flow rate (NS) of the collector

	Product Name	Output%	Coppercontent%	Copperrecovery%	NSHconsumptionmg/kg
1	**2**	**3**	**4**	**5**	**6**
1	Basiccond	1,6	18,2	71,02	0
	Tails		0,08		
	Source		0,41		
2	Basiccond	1,6	17,1	67	50
	Tails		0,10		
	Source		0,41		
3	Basiccond	1,23	17,3	66,4	100

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	Tails		0,09		
	Source		0,41		
4	Basiccond	1,5	17,9	65,5	150
	Tails		0,06		
	Source		0,41		
1	**2**	**3**	**4**	**5**	**6**
5	Basiccond	1,9	18,68	76,1	200
	Tails		0,10		
	Source		0,41		
6	Basiccond	1,94	18,13	75.77	250
	Tails		0,06		
	Source		0,41		
7	Basiccond	2,03	17.79	75.01	300
	Tails		0,08		
	Source		0,41		
8	Basiccond	2,87	17.32	74.45	400
	Tails		0,07		
	Source		0,41		
9	Basiccond	2,93	16.03	73.46	500
	Tails		0,08		
	Source		0,41		

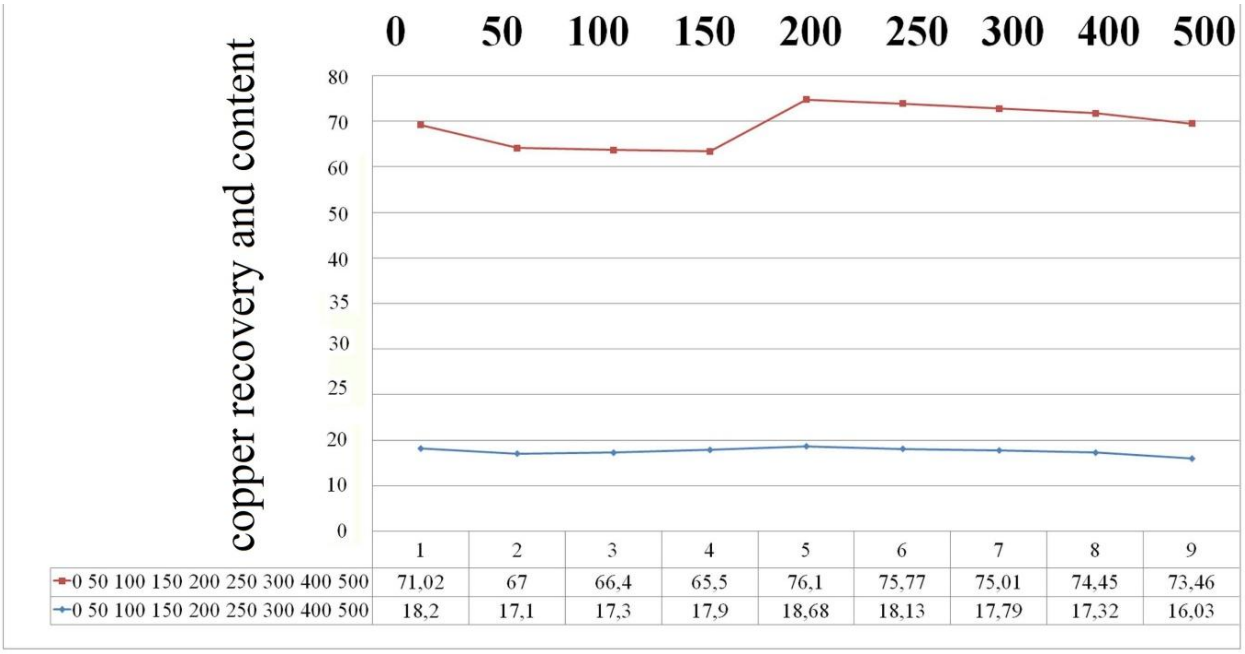

Figure 1. NSH collector flow

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Table 2Dependence of the degree of copper content in flotation on the flow rate (HA-1) of the foaming agent

	Product Name	Output %	Coppercontent %	Copperrecovery %	PSconsumptionmg/kg
1	**2**	**3**	**4**	**5**	**6**
1	Basiccond.	3,56	16,11	58,23	0
	Tails		1.018		
	Source		0,44		
2	Basiccond.	3,91	14,98	57,03	50
	Tails		1.018		
	Source		0,42		
3	Basiccond.	3,47	15,78	57,97	100
	Tails		1.018		
	Source		0,41		
4	Basiccond.	3,53	16,75	58,95	150
	Tails		1.018		
	Source		0,41		
1	**2**	**3**	**4**	**5**	**6**
5	Basiccond.	3,75	15,93	58,01	200
	Tails		1.018		
	Source		0,49		
6	Basiccond.	3,32	14,78	55,27	250
	Tails		1,018		
	Source		0,43		
7	Basiccond.	3,92	14,07	54,98	300
	Tails		1.018		
	Source		0,47		
8	Basiccond.	3,47	13,96	53,96	400
	Tails		1,018		
	Source		0,41		
9	Basiccond.	3,91	13,75	53,17	500
	Tails		1,018		
	Source		0,49		

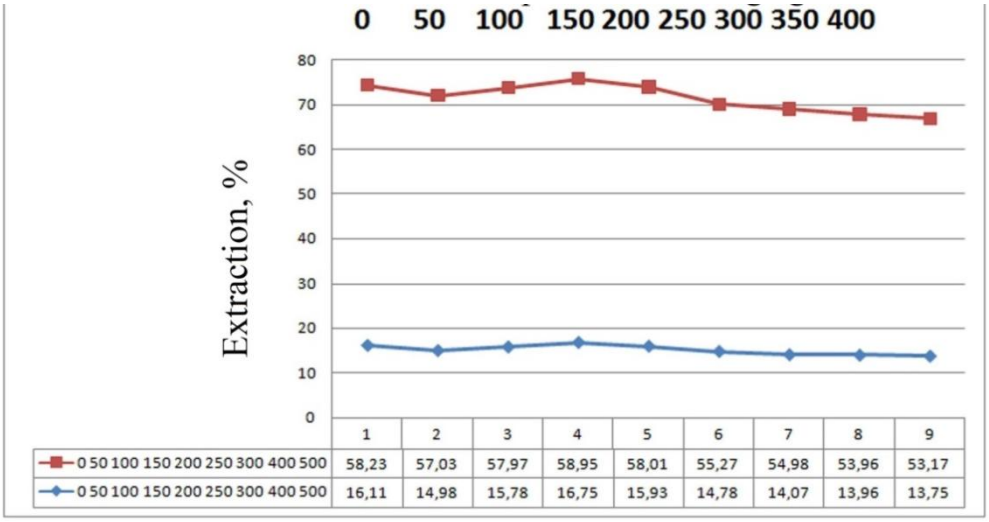

Figure 2.Foaming agent consumptionNA-1

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IV. EXPERIMENTAL RESULTS

At lower NS and PS costs, concentrates were obtained with a low copper content and recovery in copper concentrates during slag flotation. The best results were obtained with a flow rate of NS - 200 g / t and PS-3 g / t.

The experiments were carried out in an alkaline medium at pH = 9-11 created by lime.

Thus, the following conditions for the flotation of ore and slag were determined from laboratory experiments: Grinding of ore and slag with a particle size of 2-2.5 mm for 10, 30, 40, 50, 60, 70 minutes, and thus the grinding time was determined. Then the main flotation for ore was carried out for 7 minutes, for slag 15 minutes and control flotation for ore 5 minutes, for slag 15 minutes with a factory reagent mode.

A further 9 experiments were put at the expense of NS and PS.

The results of experiments in an open cycle allow us to conclude that at a flow rate of NSh-1 -2 g / t and butyl xanthate 3 g / t, as well as at a flow rate of 1 g / t of foaming agent PS 3 g / t and T-92 -50 g / t obtained good performance. Thus, our reagents showed good results.

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