

THE RESULTS OF ENRICHMENT OF SAMPLES OF ORE DEPOSITS KAQLMAKIR USING TRADITIONAL AND LOCAL REAGENT “SI”

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Abstract

In the Republic of Uzbekistan, at the beneficiation plants, for the enrichment of various ores, traditional reagents manufactured abroad are used. At present, it has become necessary to test local reagents and introduce them into the industry. Replacing traditional reagents with new ones - import-substituting reagents is relevant. Creating reagents made from local raw materials will replace the scarce traditional reagents and save a significant amount of currency.

Keywords: Ore, copper, deposit, material composition, grinding, analysis, valuable component, reagent.

Introduction

At present, there are four enterprises in the republic in which copper - molybdenum ores are being floated - the OIP, the SOF and gold-bearing ores - the AZDR, and also the GMZ - 3 GP NGMK. In these enterprises, BKK is used as the main reagent - collector, T - 80 (oxal) as a frother, or T - 92. In this paper, we present the results of the enrichment of copper ore samples from Kalmakir deposits with traditional reagents and local reagents. Samples of ore prepared by the standard method.

In order to study the material composition of ore samples, ore samples were taken for mineralogical analysis, medium samples were prepared for performing spectral, chemical, particle size analyzes.

Chemical analysis in a sample of ore from Kalmakir deposit is determined in (%): SiO_2 – 56,3; Fe_{obsh} – 2,66; Fe_2O_3 – 1,52; FeO – 1,98; TiO_2 – 0,43; MnO – 0,09; Al_2O_3 – 12,2; CaO – 2,24; MgO – 15,4; K_2O – 5,84; Na_2O – 0,92; $\text{S}_{\text{обш}}$ – 1,58; $\text{S}_{\text{sulfate}}$ – 1,53; SO_3 – 0,12; CO_2 – 0,88; P_2O_5 – 0,13; Cu – 0,36; Pb – 0,004; Zn – 0,008; As – 0,01; Mo – 0,002; Au – 0,2 у.е.; Ag – 4,7 у.е. и п.п.п. – 2,46. Semi-quantitative spectral analysis in the middle ore sample was determined (at %): Ni – 0,002; V – 0,004; Cr – 0,003; Zr – 0,004; Ga – 0,001; Be < 0,06; Sr – 0,01; Be < 0,001; I – 0,001.

Copper minerals were floated with a mixture of potassium butyl xanthate (BKK) and potassium isopropyl xanthate (IPKK) in a 1:1ratio. Using local reagent "SI" conducted flotation experiments in open and closed cycles. At the same time, the consumption of a mixture of xanthates is reduced by 50% when adding reagent "SI" – 150 g / t, the consumption of the remaining reagents is not changed.

During flotation of copper ore samples from the Sarychek deposit, the following optimal flotation mode was determined using traditional reagents: grinding size % class. – 0,074 mm – 65; reagent consumption g / t: in the grinding of lime (by CaO) – 400; to the main flotation of Na_2S – 40; BKK + IPKK – 15; T- 80 – 20; to control flotation флотацию Na_2S – 8; BKK + IPKK – 7,5; T – 80 – 10; regrinding of rough concentrate % class - 0.074 mm - 98.0; flotation time, min: primary - 10; control - 7; 1 cleaning - 5, 2 cleaning - 4.

When using local reagent "SI" the consumption of reagents of collectors was, g / t; in the main "SI" -100; BKK + IPKK – 7.5; in the control BKK + IPKK - 3,5; the rest unchanged.

Table 1 The results of the flotation of the sample ore deposits Kalmakir using traditional reagents in the optimal mode

Products	Yield,%	Content%		Recovery,%	
		copper	sulfur	copper	sulfur
Open loop					
Concentrate	1,8	18,9	15,15	84,26	14,9
Promprodukt 1	5,7	0,17	1,15	2,7	4,2
Promprodukt 2	3,2	0,55	1,92	3,34	3,89
Promprodukt 3	6,8	0,17	6,87	2,8	29,2
Tails	82,5	0,031	0,89	6,8	47,81
Ore	100	0,39	1,6	100,0	100
Closed loop (on a continuous process basis)					

Concentrate	2,1	15,29	15,12	89,2	22,1
Tails	97,9	0,039	1,29	10,8	77,9
Ore	100	0,36	1,58	100	100

Table 2 The results of the flotation of ore deposits Sarycheku using local reagent "SI" and 50% consumption of a mixture of xanthates.

Products	Yield,%	Content%		Recovery,%	
		copper	sulfur	copper	sulfur
Open loop					
Concentrate	1,2	24,15	22,88	82,8	17,6
Promprodukt 1	4,6	0,23	1,19	3,0	3,5
Promprodukt 2	4,3	0,37	1,34	4,5	3,7
Promprodukt3	5,9	0,18	6,93	3,0	26,2
Tails	84,0	0,027	0,91	6,7	49,0
Ore	100,0	0,35	1,56	100,0	100,0
Closed loop (on a continuous process basis)					
Concentrate	1,5	21,6	24,65	90,0	23,4
Tails	98,5	0,036	1,23	10,0	76,6
Ore	100,0	0,36	1,58	100,0	100,0

Comparing the results of the experiments are given in table. 1 and 2, we can assume that the indicators for copper extraction are almost the same, but the quality of the concentrate is higher in experiments using "SI".

As a result of the conducted studies, recommended schemes for flotation of ore samples from the Sarychek deposit using a combination of traditional collectors and "SI" while saving BKK + IPKK at the level of 50% were developed and flotation concentrates of higher quality were obtained.

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