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RESEARCHING THE TECHNOLOGY OF OBTAINING MOLYBDENUM FROM X CONTAINING MOLYBDENUM

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ABSTRACT

This article discusses the advantages and disadvantages of modern technologies for the extraction of molybdenum, rhenium, copper, iron and rare metals, as well as an analysis of traditional technologies for processing molybdenum solid industrial waste and waste solutions.

Key words: *molybdenum, sludge, magnetic separation, waste, sorption, reagent, molybdenum extraction.*

АННОТАЦИЯ

В данной статье рассмотрены преимущества и недостатки современных технологий извлечения молибдена, рения, меди, железа и редких металлов, а также проведен анализ традиционных технологий переработки молибдена в твердые промышленные отходы и отработанные растворы.

Ключевые слова: *молибден, шлам, магнитная сепарация, отходы, сорбция, реагент, извлечение молибдена.*

INTRODUCTION

The advantages and disadvantages of today's technologies for extracting of molybdenum , copper, iron, and rare metals are studied, also traditional technologies molybdenium industry solid waste and waste solution processing are analyzed.

Literature analysis shows that ion exchange technologies for extracting molybdenum from man-made solutions have been considered, methods for increasing the degree of separation of molybdenum have been studied, also studied foreign technologies of nitrate acid processing of molybdenum from solid waste. The results of the analysis of the literature determine that the research of methods for

accelerating the processes of sorption of molybdenum with the participation of highly effective resins is one of the urgent tasks.[1]

DISCUSSION

Objects of research on the formation of solid and liquid waste were identified, materials on chemistry and mineralogical composition-research object and analysis, based on the data of chemical and mineralogical analysis, research methods were developed for extracting valuable components from solid waste and industrial sewage, and a sequence of works was developed for each experiment, that's is to say, magnetic separation test of puff pastry, selective transfer of molybdenum, copper and other structural metals to solution, copper deposition from solution, sorption and extraction of molybdenum and rhenium from stored solutions and a sequence of processes was developed for their disposal using abandoned solutions.

RESULTS

Experiments on the enrichment of suspension cake magnetic method are carried out on the laboratory sorter in a continuous mode at the strength of the magnetic field of 360 ka / c.When performing the work, the following parameters are variable: sorting duration (5, 10, 15 minute), S:L ratio=1: 1, 1:2, 1: 3, fever(20, 30, 40 0C).[2]

The results of experimental tests in which it was shown that magnetic separation of sludge-cake and enrichment of molybdenite, as well as treatment of applewood semi-finished product containing 12-15% sulfide iron with nitric acid oxidizes trivalent iron to the hydrated oxide form by 95.0-98.0% are presented. In addition, the puff cake contains large amounts of ferromolybdenite, which retains 30% of the iron hydroxide.Studies have shown that, since oxides and hydrated iron oxides have a low magnetic property, this is the basis for separating iron from the contents of the sludge kek. Studies have found that large amounts of iron can be transferred to enrichment using aqueous magnetic separation with the addition of magnetic particles and PAA(polyacrylamide) [3]

After that, experiments were carried out on cementing copper from the composition of magnetic separation solutions. It was determined that the optimal conditions for cementing copper are: чўктирувчининг Na2S сарфи стехиометрик миқдирга нисбатан 1,50 баробар, temperature60°C, time 30minute, here is the rate of deposition of copper 95,8%. Copper 22,4 %, gold 8,0 г/т, silver21,0 г/т. enrichment is obtained. 2,4% Mo and 0,011% Re component of puff pastry to extract molybdenum and rhenium from its non-magnetic product, a two-stage soda selective thawing process is carried out. The results of the experiment are shown in Table 1. At

the magnetic separation S:L = 1:2 in the ratio, per minute 300 мл. We send the pulp cake with cuttings.1000 гр. From kek 30 гр. product without magnets received, residue 70 гр. product goes to waste 200 мл.[4]

Table 1

Results of an experiment on magnetic separation of oat cake

№	Name of the product	Fe, %	Cu, %	Mo, %	Specific weight, т/м^3
1	First cake	9,5	1,2	4,8	1,33
2	Magnetic fraction	26,9	0,05	0,2	1,24
3	Non-magnetic fraction	1,8	2,4	5,2	1,41

The composition of the soda selective melting solution and the slurry field abandoned solution for the selection of rasional technology (g/л): Mo 0,2÷2.0; Re 0,01÷0,05; NO_3-25,2; SO_4 – 14,7) experiments were carried out to extract molybdenum and rhenium from combined solutions.

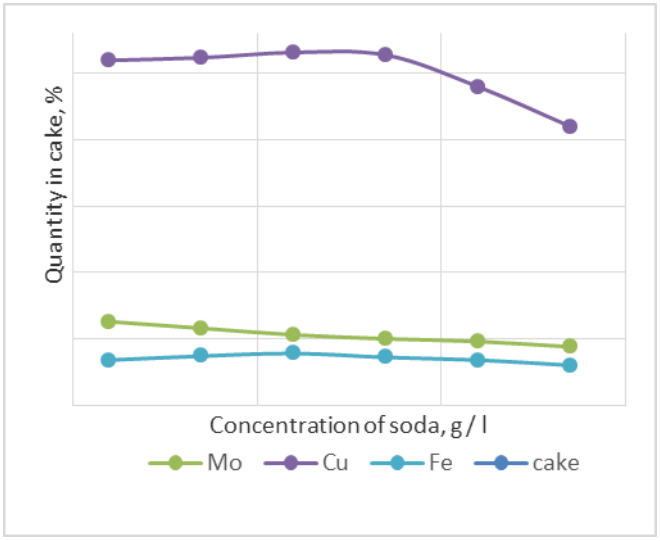
The first stage of selective dissolution:3,98% molybdenum, 2,51% copper, S:L =1:4 and concentrate of dehydrated soda 120,0 г/л, temperature80,0-85,0℃; 2 during the hour 200 gr. waste in quantity kek sample mixing speed 120 round/minute. and size 3,0 litre selectively dissolved in a laboratory reactor (Table 2).

Table-2

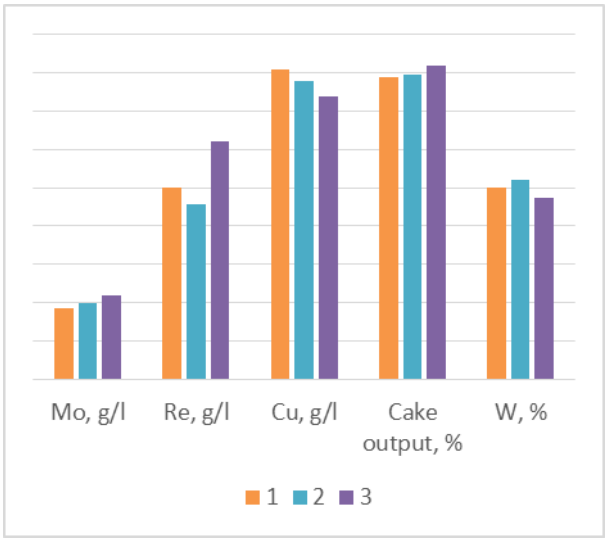
Results of phase 1 selective smelting experiments to extract molybdenum and other non-ferrous metals from magnetic separation waste

Sample №	**The composition of the resulting solution**			**Giving keck:**							
				output, %		**W, %**	**Keck ingredients, %**			**ε, %**	
	Mo, g/l	**Re, g/l**	**Cu, g/l**				**Mo**	**Cu**	**Fe**		
1			18,6	50,2	81,0	78,75	50	1,63	3,6	1,34	63,7
2			19,8	45,8	78,0	79,5	52	1,53	3,66	1,53	65,7
3			21,8	620	74,0	82,0	47,5	1,48	3,4	1,34	68,3

Figure 1 shows the results of Phase 1 selective smelting experiments to extract molybdenum and other non-ferrous metals from magnetic separation waste.



pic. 1.Effect of technical soda concentration on selective smelting process



pic. 2. The composition of the resulting solution, the output of the cake and the dependence of the moisture content of the resulting cake on the concentration of calcined soda

The effect of technical sada concentration on selective smelting process for molybdenum extraction is shown. From the results, it can be concluded that an increase in the concentration of technical soda has a positive effect on the degree of extraction of molybdenum. A sharp increase is observed when concentration of Na2CO3 is 140-145 g/l. Further increase in concentration does not give a noticeable result. pH-9, amount of molybdenum 18,6 г/л, amount of rhenium 50,2 мг/л, amount of copper 81,0 мг/л, residual amounts of dehydrated soda 28,8 g/l concentrated molybdenum solution was obtained.

Molybdenum was obtained from kek with a content of 1.63%, copper 3.6%, iron 1.34%, humidity of 78.75% with an output of 50.0%.

With an increase in the concentration of Na2CO3, the amount of copper in the solution obtained decreases, the concentration of Mo increases, that is, it passes into the solution.[5]

Second stage of selective dissolution: the first stage was obtained from selective melting, the kek containing 1.63% molybdenum was loaded into a laboratory reactor in an amount of 157.5 g the first stage was obtained from selective melting, the kek containing 1.63% molybdenum was loaded into a laboratory reactor in an amount of 157.5 g and the concentration of soda is 140.0 g/l., At temperature

Q:S=1: 4, 80.0-85.0℃, selective smelting process was carried out for 3 hours. Molybdenum concentration 8.2 g/l, rhenium concentration 12.0 mg/l, sodium molybdenum solution with residual soda content of 65.6 g/l was obtained. The degree of separation of molybdenum from the first stage selective melting cakes into the second stage solutions was 69.17 (table-3).

CONCLUSION

Laboratory experiments and experiment-in tests carried out on industrial machines, it was found that the most effective and high-selectivity molybdenum sorbent from the solutions under study is the "Purolite" brand A-100 (Mo) sorbent and the "Purolite" brand A-170 resin for the sorption of rhenium.

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