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SORBTSION-SPECTROSCOPIC DETERMINATION OF RHENIUM ION IN INDUSTRIAL WASTE OF" OLMALIK KMK " JSC USING ORGANIC REAGENT

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ABSTRACT

A sorbtsion – spectroscopic method with high sensitivity and selectivity for the determination of the rhenium (III) ion has been shown. The developed sorbtsion – spectroscopic method was applied to Real objects (industrial waste technological water and cakes), the results were processed by the method of Mathematical Statistics and information about its application in the analysis.

Keywords: bismutol-2, rhenium (III) ions, analytical reagent, immobilization, sorbtion-spectroscopic detection, buffer reagent.

I. INTRODUCTION

The development strategy for the further development of the Republic of Uzbekistan defines the tasks of "raising the industry to a qualitatively new level, deeply reworking local sources of raw materials, accelerating the production of finished products, mastering and improving technologies for obtaining new types of products." important tasks aimed at are defined. In this regard, it is important to create a new type of sorbtsion-spectroscopic materials with an improved property of obtaining synthetic materials from local raw materials and their effective application in solving various problems related to environmental protection.

The most stable compounds of rhenium in nature are chalcogenides, disulfide rhenium metal has been found to resemble molybdenum and tungsten disulfide in physical and crystal lattice properties. In terms of its physicochemical properties, rhenium is closest to molybdenum, followed by platinum group metals, as well as the arrival of W, Cu, V, Co, Ni, etc.

Rhenium is also very low in minerals because it is located scattered in nature, and a common single mineral is the very popular bulib, which is jezkazganite- $CuReS_4$. It has been studied to occur as part of the copper molybdenum ores of the cup. It is in the Olmaliq ores that it is induced to occur in this mineral state. Rhenium is a buladi found mainly in the copper sulfide and molybdenite minerals in a scattering state. It is also more commonly found in the minerals chalcopyrite, bornite, jezkazganite. Therefore, the separation and properties of rhenium as a satellite have been studied in copper and molybdenum technology.

In the determination of rhenium in a metallic state, its sulfide or rhenium 4 oxide is returned with hydrogen at 900-1000 0S so that the free metal falls into the precipitate. In the determination of rhenium, the degree of halacite has also been studied by those who form volatile compounds with heptasulfide, such as sulfur arsenic, germanium, selenium.

Optimal conditions for complex formation of rhenium 4 with tetraphenylarsazole have been studied, according to which the resulting complex formed a stable complex at pH=1 and in a 1m hydrochloric acid medium for 1 day. The detection of rhenium was hampered by abundant Mo(IV), Ag(I), Pd(II), Au(III) ions. A method was created to identify rhenium (III) with perrenate nitron immobilized into a colorless polymetacrylate Matrix, and using this method, rhenium metal was detected from the solution composition. Determination of rhenium is not disturbed by Mo (II,IV), Ni (II), Co (II), Pb (II), Zn (II), Cd (II), Cu (II) ions in a 1:100 ratio. RN=1 has been studied to have a rhenium detection concentration of 1 mg/l, Sr = 0.03-0.05.

II. GENERAL METHODOLOGY OF WORK

Optimal carrier selection for organic reagent

Bismutol-2 has been selected for its high sorbtion capacity for organic reagent and has been selected to prepare immobilized carriers and immobilized fiber sorbents into chlorine form into 5-mercapto-3-phenyl-1,3,4-thiadiazoltion-2 organic riagent (bismutol-2) **ПАН ГМДА,** ППМ-1, **ППА-1 [H+]** sorbents. Based on the results obtained, the results in optimal conditions for each immobilized fiber were presented in Table 1.

Table 1 Optimal carrier selection (l=1, t=25±5⁰C)

Fiber	A until immobilization (bismutol – 2)	A untilimmobilization then (bismutol – 2)	Δ A
ППА-1 [H⁺]	0,35	0,12	0,23
ППМ-1		0,090	0,26
ПАН ГМДА		0,190	0,160

As can be seen from the table, the best immobilable fiber PPM-1, so the same fiber was used in subsequent work.

Immobilization methodology:

A 10 ml 0.1% bismutol-2 Reagent was added to 100.0 ml measuring cups, 0.2000 g of fiber was placed and mixed using a glass stick for 5-8 minutes, then the fiber was washed with distilled water and the amount of reagent sitting on the fiber was measured. The results show that the immobilization of the bismutol-2 Reagent into the fiber is expressed by the following formula.

$P\text{-}NH_2 + HC1 \rightarrow P\text{-}^{+}NH_3C1^{-}$

$P\text{-}^{+}NH_3C1^{-} + N\text{–}S\text{–}R \rightarrow P\text{-}^{+}NH_3 - N\text{–}S\text{–}R$

In this, $P\text{-}NH_2$- polymer carrier

Ar–N–S–R– bismutol-2 reagent

Study of the optimal conditions under which bismutol-2 organic reagent forms immobilization conditions and complexes with rhenium ions

From the above methods, optical densities were measured by pouring fiber, reagent, buffer, metal ions into 100 ml measuring cups in different orders in order to select the optimal conditions for the bismutol-2 organic reagent (λ_{max}=460, t=30 min, pH=4-5 universal buffer). The results obtained are given in Table 2.

Table 2 Casting procedure

(t= 30 min, T=25 ^{0}C, pH=4-5 universal buffer, PPM-1)

№ т/р	Casting procedure	Optical density difference ΔA
1.	Reagent+Me + Fiber+Buffer	0,230
2.	Fiber+Buffer+Me+Reagent	0,290
3.	Fiber+Reagent+Buffer+Me	0,332
4.	Reagent+Me+Buffer+Fiber	0,265
5.	Me+ talla +Reagent+Buffer	0,105
6.	Me+ Talla +Buffer+Reagent	0,109
7.	Reagent+ Tela +Buffer+Me	0,118
8.	Reagent+Me+Buffer+ Fiber	0,113
9.	Reagent+Buffer+ Fiber +Me	0,126

Concluding from Table 2, the maximum analytic signal was observed by immobilizing the bismutol-2 Reagent into the PPM-1 fiber and then transferring the rhenium (III) ion, and a third casting procedure was chosen.

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