To Develop a Method of Sorbtion Spectroscopic Determination of Some Rare Metals in the Technological Waste Content that is Formed in the Production of Copper

Mirzakhmedov Rustamjon Mirhamidovich
Assistant of the Department of Mathematics and Natural Sciences of the Faculty of Energy and Mechanical Engineering of the Almalyk branch of Tashkent Polytechnic University

Madusmanova Nazira Kuchkarbaevna
Lecturer of the Department of Chemical Technology of the Faculty of Energy and Mechanical Engineering of the Almalyk branch of the Tashkent Polytechnic University

Smanova Zulaykho Asanalievna
Professor of the Department of Analytical Chemistry of the Chemical Faculty of the National University of Uzbekistan, Republic of Uzbekistan, Tashkent

ABSTRACT

Analytical determination of rhenium ions using organic reagent the possibility of using them as a specific analytical reagent for immobilization in fiber carriers and determination of metal ions, in particular for the determination of rhenium ions has been developed. A simple, Express method of determining the renium ion using vismutol-II is shown. Optimal conditions of immobilization are found. Physico-chemical properties were determined, the results were processed by the method of Mathematical Statistics and data on their application in the analysis were given.

KEYWORDS: *renium ions, bismutol-II, analytical reagent, immobilization, sorbtsion-spectroscopic determination, buffer reagent.*

In the Republic of Uzbekistan there are almost all sources of mineral homashyo, including those containing rhenium. The most stable compounds of rhenium in nature are xalcogenides, while disulfide rhenium is similar in physical properties and crystal lattice parameters to molybdenum and tungsten disulfide. By its physico-chemical properties, it is closest to rhenium molybdenum, followed by metals of the platinum group, as well as W, Si, V, so, Ni and others [1]. Renyi is in great demand in metallurgy. Added as an alloy element in high-temperature nickel alloys. Also for various purposes, the production of platinum-renium catalysts was widely established. To date, its application in various fields has increased several times. Despite the fact that rhenium belongs to grass-resistant metals, it is still radically different from other metals of this group. For example, it differs from tungsten in that it does not enter the cycle with water (in the case of a process hack that damages the main part of the bunda vacuum lamps). This is the reason why the vacuum lamp, made with the element of rhenium, has a "long service life". Fortunately, it can serve for a whole century (100 years) [2].Renium is also used in the production of electronic devices and electrotechnics (thermocouples, anti-cathodes, semiconductors, electronic tubes, etc.).No less important is the application of this element in the aerospace industry. Renium is used in the production of light fixtures and electrical vacuum equipment. Semiconductors are not only made from it, but are also

added to alloys, which are then used in the manufacture of bases with kernels-a rotating frame [3]. One of the important aspects in the processing of copper waste is the renium, which, in addition to a few scattered elements of copper, is one of the most interesting for extraction. The dynamic and fully dynamic sorption capacity of AV-17-sorbent was determined when there were perrenate ions from ammonium solutions of copper solution gasification [4]. The process of separating the rhenium ion from the compound composition involves complex chemical tasks. The element of rhenium is one of the unique elements in the Earth's crust, the low prevalence of rhenium in the industry, the price of separation includes technological processes that distinguish it from a little gambling and superalloy. In this study, separation and observation was carried out at different stages of the refining process to obtain rhenium from CMSX-4 superalloy using distillation process. In this method of combining distillation and Exchange Resins, a complex mixture of metals from the CMSX-4 superalloy was used to separate the rhenium. Determination of perrenate and other ions and quantitatively atomic absorption spectroscopy (AAS), Fourier transform Infrared Spectroscopy ((FTIR), ion chromatography (IX) and scanning electron microscopy - energy dispersing X-ray (SEM-EDX) were carried out. In this method, perrenate anions were obtained with a purity of about 93%. Analytical properties of the infrared spectroscopic method for rapid determination of perrenate anions from CMSX-4 are presented. [5]. Renium (ReVII) – three in the case of sedimentation (including uranium and molybdenum) with xar-identical ions in the composition of industrial wastewater. 187re and 187os are always found in sedimentary rocks together and emit Os-isotopic alloys in nature [6].

Preparation of working solutions for renium ion. The sample weighing 0,2 - 2 g is thoroughly mixed in a porcelain mortar with the addition of 3-5 g of oxide and 0.1-0.2 g of potassium permanganate, on which 2-3 g of oxide is placed again and heated in a mufel oven (SNOL, which gives a temperature of 1000°C). The sample is taken after a while and cooled in volume, then taken to the tigel (small tigel 4 GOST 9147-80) and dissolved in 200 ml of hot water in a tube with a volume of 40-60 ml and boiled for 2 hours, then mixed with a glass stick. The solution is filtered through a double filter after cooling. The formed sediment is dissolved in hydrochloric acid and filtered through a double filter. The filter is washed 6-7 times with distilled water, cooled. The solution is transferred to a measuring tube with a volume of 200 ml, the volume of which is brought to the mark with distilled water.

*Komplex dressing with rhenium ion vismutol - 2 Reagent.*For the preparation of immobilized carriers with 5-mercapto-3-phenyl-1,3,4-tiadiazoltion-2 potassium tuzi (bismutol-2), the reagents of bismutol-2 immobilized into different fiber sorbents. The Vismutol-2 Reagent was first prepared for use in fiber to immobilize the fiber. To do this, 0,2000 g of fiber carrier 50,0 ml was washed with 0,1 M li NSI and transferred to the anion exchanger-CI - form, then washed down with distilled water (repeated 2-3 times). The finished fiber for immobilization was kept in a moist state.

Table 1. Choosing the Optimal carrier (t=25^{0}C)

Fibre	A until immobilization (bismutol-2)	A immobilized then (vismutol-2)	λ, нм
PPM-1	**0,35**	**0,12**	**0,23**
PPA-1 [H^+]	0,700	0,290	0,410
PAN GMDA	0,700	0,500	0,200

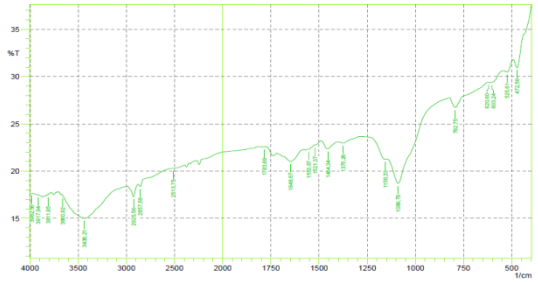
As can be seen from the table, the best immobilized fiber, PPM-1, therefore, in subsequent studies, the same fiber was used.

Studying desorption of renium on fiber with immobilized vismutol-2 Reagent

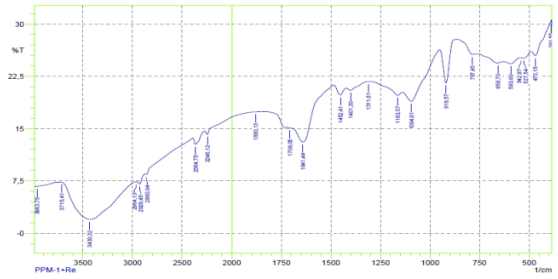
To study the sorbtion property of PPM-1 ionite and to isolate rhenium with amino - carboxyl group preservative sorbent from diluted solutions: Re7+ 0,02; Ca2+ 0,096; Na+ 0,15; Cl - 0,2; SO42 - 0,035; HCO3-0,24 g/dm3; pH 5-6 and ionitlarni analysis from solutions. From these ionite solutions in the form of $ReO4^{-}$ anion, in the equilibrium state of 50-ml Solutions of Re(VII) 20 mg/l in 50-ml conical tubes with a variable concentration of solution, 0,025 G sorbent is placed. Then the samples are mixed with the solution for 2-H 20±2 0S. The mass of the rhenium in the filtered solution is measured. The analysis of the renium element is carried out by the method of photocoloriometric analysis. From the composition of the solution, it is studied how much sorption of the rhenium anion, the content of ionite with the solution is as follows 1 1 (0,025 g ionite 25 ml solution), in the preparation of the solution, chloride, sulfuric acid sodium bicarbonate was used. With this method, the sorption process occurs in part of the mixed solution, and its initial composition is known, in this case the sorption anion changes during the analysis and goes at a certain speed. If the solution is under mechanical influence, the solution will be evenly distributed over the entire volume, during the experiment, the pairing of the solution with the sorbent is carried out using a mesh. When the solution is analyzed, the sorbent is separated from the solution, the amount of renium in the sorbent is obtained by the concentration of renium in the case after sorbtsion and before sorbtsion. In order to increase the effectiveness of sorbents, the degree of desorption is related to the environment. To perform desorption, immobilized reagent was washed down with hydrochloric, nitric and sulfuric acids (concentration 0,5-5,0 mol/l) of komplexine, which were formed by renium (up to 5-20 ml). The amount of renium was determined by spectrophotometric and atomic absorption methods.

Study of immobilized reagent and Komplex structure by IR-spectroscopic method

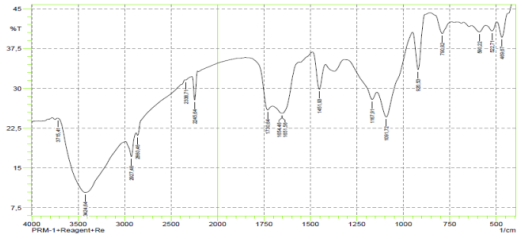
The structure of the komplexi, formed by the immobilized reagent renium(VII) Ion, was determined by using IR-spectroscopy of immobilization mexanizm of the reagent to the fiber. IR spectra were studied using SHIMADZU branded instrument witheksexnilletkaetka statetirib 400-4000 cm-1 frequency range. To study the immobilization of Vismutol-2 reagents into fiber, the IR spectra of fiber, reagent, immobilized fiber, Komplex and immobilized Komplex were measured.



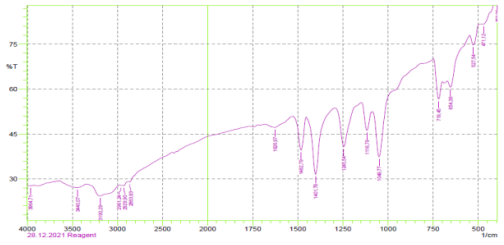
1-picture. PPM-1 IR spectrum with fiber IR spectrum



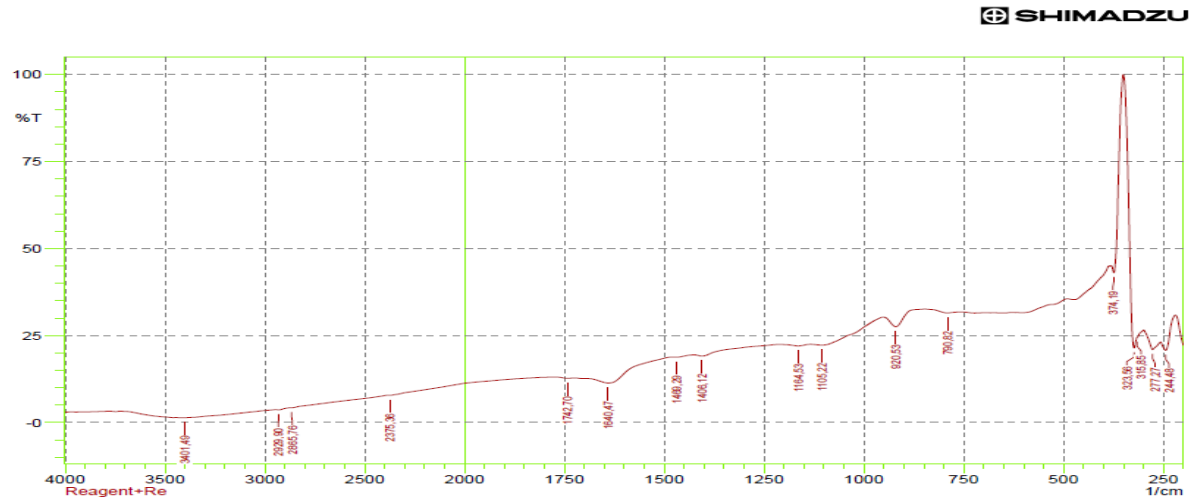
2-picture. Re metal with PPM-1 fiber



3-picture. IR spectrum with PPM-1, reagent and Re metal.



4-picture. Bismutol - ik-spectrum of 2 Reagent



5-picture. Visektsii ik spectrum of bismutol-2 Reagent with Re metal

To examine the effect of copper and cobalt compounds on renium from the composition of solutions. Since the solution contains mainly copper and cobalt compounds when we analyze it in the production process, sorption-desorption of such foreign ions has also been studied, the results of the experiment are presented in Table 4.6.1 in Qu. As can be seen from the table, in combination with rhenium, sorption of copper and cobalt, nickel occurs, such metals do not connect well with SIM-202 anionite and allow cleaning from the contents of the solution with the help of sulfuric acid. With anionite-SIM-202, the resultsof sorbtsia-desorption in stages are presented, perrenate ammonium is obtained from the solution by methods of sorbtsia, liquid extraction, deposition. The trout ore is not limited to the copper deposits in the district, but also is a zone rich in gold, copper and other valuable metal ions, and the amount of non-traditional species is threeraydi on an industrial scale.

Table 2. The composition of the solution is rn 1,7; [Re] = 3,2 mg/l; [Cu] = 410,7 mg/l; [Co] = 149,5 mg / l; [SO42-] = 54,5 g / l; [NO3-] =20,0 g/l

Босқичлар №	**Анионит хажми mg/g**		
	Re	Cu	Cd
Биринчи	5,08	0,200	0,140
Бешинчи	4,98	0,377	0,299
Ўнинчи	4,98	0,417	0,322

As can be seen from the results, it is possible to prevent copper and cadmium desorption with anionite wire-202 with 10-50 mg/l of concentrated sulfuric acid. As can be seen from the results, the optimal conditions for renium are the presence of concentrated sulfuric acid 10-50 mg/l. If the concentration of sulfuric acid is less than 10 mg/l copper and cadmium desorption does not occur, if the concentration of sulfuric acid exceeds 50 mg/l renium begins to be significantly desorbed, the sensitivity of anionite to copper and cadmium in such a case does not change. To re-use ANIONITE, SIM-202 is washed down with a solution of sulfuric acid and with water. It is necessary to send ammonia gas to this process in a uniform manner and keep the temperature to a norm, it is possible to bind in the case of rhenium ammonium perenate in the solution and separate by electrodialization, the results are presented in Table 3.

Table 3.. Results of anionite-wire-202 sulfuric acid treatment Our obtained saccharides are carried out in an exact ratio of 1:2 with acid

Concentration H_2SO_4, g/l	Anionite volume, mg/g		
	Re	Cu	Co
0	4,98	0,417	0,322
5,0	4,98	0,400	0,244
10,0	4,98	0,120	0,120
25,0	4,98	0,078	0,100
50,0	4,98	0,060	0,100
55,0	4,95	0,060	0,100
60,0	4,94	0,060	0,100

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