SORBTSION-PHOTOMETRIC DETERMINATION OF RHENIUM METAL IN Zr AND Pb CAKE

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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.*

АННОТАЦИЯ

Аналитическое определение ионов рения с использованием органического реагента. Разработана возможность использования их в качестве специфического аналитического реагента для иммобилизации в волокнистых носителях и определения ионов металлов, в частности для определения ионов рения. Показан простой экспресс-метод определения иона рения с использованием висмутола-II. Найдены оптимальные условия иммобилизации.

Определены физико-химические свойства, результаты обработаны методом математической статистики и приведены данные по их использованию в анализе.

Ключевые слова: *ионы рения, висмутол-II, аналитический реагент, иммобилизация, сорбционно-спектральное определение, буферный реагент.*

INTRODUCTION

To date, it is distinguished from other industries in the world by its remarkable development that has arisen in the field of chemistry in the last two hundred years. All the chemical elements discovered in the world in recent years have been fully studied by scientists for their physical and chemical, physical and chemical properties. It is firmly connected with technology and industry, and requires extensive application of modern equipment physico-chemical methods of separation and determination of various biological objects, mining products and their decomposition products.

In our republic, many metals are obtained directly or indirectly with the help of gidrometallurgical processes, and their release increases year by year. When choosing mining products, the metal passes into the solution without ions. In order to separate the metal from the solution, various methods are used, including electrolysis, the use of gases, metals to precipitate back or precipitate in case of difficult dissolution, and to carry out these methods require solutions of high concentration sorbtsion - spectroscopic methods are being developed to eliminate similar phenomena.

Currently, industrial waste water can contain several rare metal ions.Studies are underway to develop methods of sorbtsion - spectroscopic analysis of fast and highly selective exposure of similar metal ions to different carriers using immobilized organic reagents.

Therefore, it is necessary to improve the existing analytical processes of determining the renium ion, as well as to develop new, more advanced and modern sorbtsion - spectroscopic methods that meet modern requirements.

DISCUSSION AND RESULTS

Preparation and analysis of the solution. samples were selected for carrying out ajriba, the solution mainly used NO3–, SO4 2–, Cl– to separate the rhenium metal from the impurities (uranium, iron, molybdenum, etc.). The analysis for renium was carried out in the OTMC – Central Laboratory, for RN-measurement is carried out using the EVLM-300 glass electrode, the results of the analysis are presented in Table 1.

Table 1

The wavelength of the renium ion in solution

Identifiable element	Wave length, nm
Rhenium	197,312 221,426 227,525

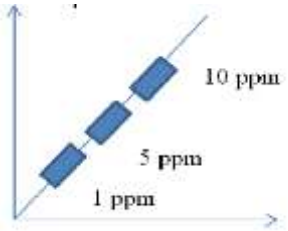
1.General requirements

- Sampling and preparation of samples, the analysis is carried out based on the approved data.
- The analysis is carried out in two parallel stages
- Used in technological processes
- 2. Analysis measurement accuracy

This method is based on the measurement of the electromagnetic wave length in the excited state of the atom, for the analysis of the rhenium, an Optima-8300 emmission specrofotometer is used, the resulting sample is in the powder state and 0,001; 0,005; 0,01 g/l is obtained from this sample, that is, it is in the unit of measurement:

- 1 ppм Re - 0,001 г/л
- 5 ppм Re - 0,005 г/л
- 10 ppм Re - 0,01 г/л

The resulting sample is potassium permanganate before laying on the tigel, it is laid out on top of kaltsium oxide, the drawn sample is laid out and put on top of kaltsium oxide again, after which it is heated by placing it in the mufel oven for two hours. We take the sample from the mufel, cool it and put it in a tube of 100 ml and heat it for 40-minutes in a colander until the metkas is dissolved, then the sample is filtered and boiled for another 30-minute, steam in the electropech until 60 ml in this process, various ions are precipitated in the form of salt, it is measured and when it reaches the desired result, the probe begins to measure. First we measure in 3-probe and then start measuring the sample.



If the analysis process is 9,99 rrrm I continued analizni depending on the standard, the process going through 1–minute our vision Re Reni the most sensitive-intensive point ie Reni line:

197,243
227,545 nm
204,911

Three standards are used in the calibration, which with the help of this method helps to determine the rhenium content in the sample analyzed in the interval given in Table 2-3.

Table 2

	Fixed element	Mass fraction,%
	Re	0,00005 – 0,01000

Table 3

Composition of the renium solution

Solution	**Concentration, mg/l**						
	Re	Mo	Co	NO_3^-	SO_4^{2-}	Cl^-	pH
Amount of sedimentary rocks	3,2	1,2	7,8	50000	68500	20,5	3
Results of concentration in solution	0,4	22,4	980,5	420	27200	250,5	1,3

As can be seen from the results of Table 3, the content of the sample obtained for analysis is much higher than the concentration in the case of mainly rhenium deposition, the concentration of the compound is mainly threeraydi many of the compounds made dressing with nitrate ions.

Preparation of a working solution for rhenium:

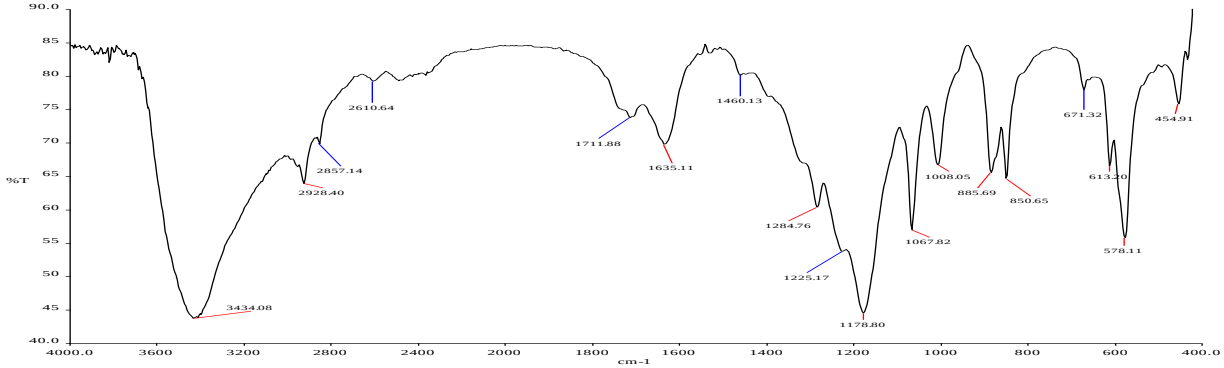
1. For the preparation of a working solution of 0,01% li vismutol-2 reagents, 0,01 g of vismutol-2 reagents were pulled from the analytical scales and put it in a measuring tube of 100 ml and brought to the mark with water. The finished solution was diluted and applied to subsequent works. For the preparation of a standard solution of Re7+ ion 1mg/ml of salt, 0,732 g of ammonium perrinate salt was taken, 100 ml of li was put into the tube and brought to the mark with distilled water. In subsequent studies, the same solution was used.[151].

2. In the preparation of 1,0•10-1 M li hydrochloric acid solution concentrated hydrochloric acid was prepared.

3. Buffer solutions were added to the various RN (1-12) Li universal buffer mixture from 0,04 M li (H3BO3, H3PO4, CH3COOH) 0,2 M NaOH solution. Other buffers were also prepared as in the literature[45].

4. For the preparation of fibers, 0,2 g was taken from the fibers synthesized under the chemistry of polymers. The fibers were laid into hydrochloric acid 0,1 M li and held in the form of chlorine. Washed with distilled water until the neutral state. In a wet state, Petri was kept in the attic.

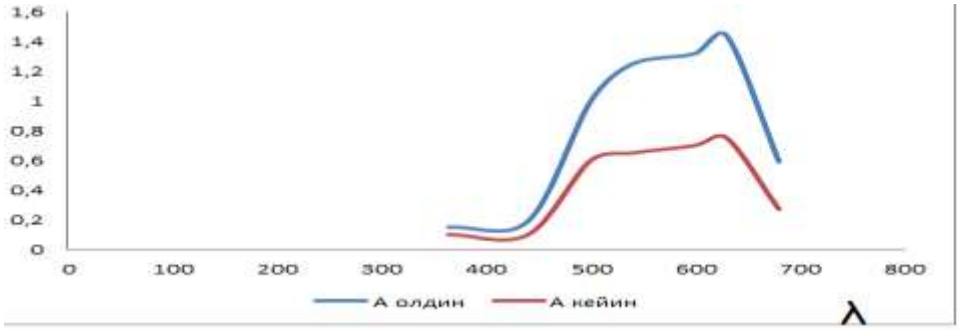
Immobilization Technique: in 50,0 ml measuring cups 10 ml 0,1% L vismutol-2 Reagent was placed 0,2000 g of fiber and mixed using a glass stick for 5-8 minutes. Then the fiber was washed with distilled water and the amount of reagent that sat on the fiber was measured, the results of which studied the immobilization of the vismutol-2 Reagent to the fiber.



1-picture. IR spectrum of immobilization of bismutol-2 Reagent to fiber

Influence of the environment on sorption of rhenium:

One of the main factors in the concentration of hydrogen ions is considered Komplex is one of the main factors that affect the formation and direction of the equilibrium of the reaction. Kafed most of the organic reagents that are synthesized and used immobilized are weak acids, and they are used to concentrate, separate and determine the renium ion.



2-picture. Vismutol - 2 reagents with rhenium before and after immobilization of the cortex chart of light absorption.

CONCLUSION

When determining the Optimal rn, the sorption level from 1,00 to 12,00 was found experimentally by means of a graph that depended on the concentration of hydrogen ions. For him, 12 drops of sorbent (volume 35 ml) to 20 mg were added to 2 ml of renium solution (concentration 10 µg/ml), 3-5ml of NaON NSl, NNO3 solutions, bringing the total volume up to 20 ml of distilled water, mixed by closing the lid at room temperature (20±50S). By filtering the sorbent through the" blue tape " filter, the amount of the element contained in the filtrant was determined using the sorbtsion-photometric method using the gradient graph using the vismutol-50 reagent on the Specord2 instrument.

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