SORBTION-PHOTOMETRIC DETERMINATION OF RHENIUM METAL IN INDUSTRIAL CAKE

Mirzakhmedov Rustamjon Mirkhamidovich
Almalik branch of Tashkent State Technical University named after I. Karimov, associate professor E-mail: rustam.mirzaxmedov23@mail.ru
Mirusmanova Parizoda Babur kizi
Almalyk branch of Tashkent State Technical University named after I. Karimov, student
E-mail:mirusmanovaparizoda@mail.ru

Abstract- Bismutol-II is used as an analytical reagent for the rhenium ion. The possibility of using them as a specific analytical reagent for immobilization in fiber carriers and detection of metal ions, in particular for the detection of rhenium ions, has been developed. A simple, Express method of determining the rhenium ion using bismutol-II is shown. The Reagent interacts with the rhenium ion in a 1:6 ratio. Optimal conditions of immobilization are found. The physico-chemical properties were determined, the results were processed by the method of Mathematical Statistics and information about their application in the analysis was given.

Key words: Rhenium ions, bismutol-II, analytical reagent, immobilization, sorbtion-spectroscopic determination, buffer reagent.

Today, the world is distinguished from other branches by its amazing development, which occurred in the last two hundred years in the sphere of chemistry. All chemical elements discovered in the world in recent years have been fully studied by scientists for their physical and chemical, physicochemical and chemical properties. This is strongly associated with technology and industry, and requires extensive use of modern equipment physicochemical methods of separation and detection of various biological objects, mining products and their decay products.

Based on the IR spectrometer, a sensor has been prepared to detect aldehydes and ketones in solution by forming a fur'e spectrum with the refraction of the full return of light. The literature shows the style of sorbent preparation and ways to make a list. For the propionic aldehyde, results were given for several probes containing 1-20% of its quantity.

A methodology for qualitative analysis of Mo(VI) has been developed in the phenylfluorin immobilized cellulosic Matrix test detection method. Phenylfluorinbilan mixed fiber (viscose-cotton) had a retention rate of 97%. Immobilization is resistant to chemical and mechanical effects. A method for determining 0.05-5 mg/l Mo(VI) in the natural water test method has been developed. The time of 10-15 minutes is enough for

analysis,Sr<0,4. ReO4-and Al(III), Ni(II), Co(II), Pb(II), Zn(II), Cd(II), Cu(II), Mn(II),Ca(II) Li(I), Ta(V), Th(IV), Hg(II), Ag(I), NH_4^+, Mo(VI) do not give halaqit. 6mg/ml W(VI), 0.5 mg/ml Fe(III), 0.05 mg/ml Zr(IV), Sb(III)and 0.01 mg / ml Ti(IV) interfere.

In our republic, most metals are obtained directly or indirectly with the help of hydrometallurgical processes, and their yield increases every year. When the mining products are selectively dissolved, the metal passes ionically into the solution. Various methods are used to extract the metal from the solution, including electrolysis, back - dipping using gases, metals, or dipping paths in the form of a difficult soluble compound, and these methods require highly concentrated solutions to carry out sorbtsion-spectroscopic methods to eliminate similar deposits are being developed.

Currently, industrial wastewater may contain several rare metal ions. Similar research is underway to develop fast and highly selective exposure sorbtion - spectroscopic analysis methods using organic reagents immobilized to carriers of different natures of metal ions.

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

Preparation and analysis of the solution.

Samples were selected to conduct the experiment, with NO_3^-, SO_4^{2-}, Cl^- used in the solution primarily to extract rhenium metal (uranium, iron, molybdenum, etc). Analysis for rhenium was carried out in the OTMK – Central Laboratory, conducted using the EVLM-300 glass electrode for pH-measurement, the results of the estimation are given in Table 1.

Table 1.

Element	Wavelength
Rhenium	197,243 227,545 204,911

1. General requirements

1.1 Sampling and sample preparation, analysis is carried out based on proven data.

1.2 Analysis is carried out in two parallel stages

1.3 Used in technological processes

2. Analysis measurement accuracy

This method is based on the measurement of the electromagnetic wavelength in the gaseous state of the atom, for the analysis of rhenium, an Optima–8300 emmision specrophotometer is used, the sample brought will be in the powder state, and this sample will be taken from 0.001; 0.005; 0.01 g/l i.e. in the unit of measurement below:

- 1 ppm Re - 0,001 g/l
- 5 ppm Re - 0,005 g/l
- 10 ppm Re - 0,01 g/l

Before the resulting sample is put into the Crucible potassium permanganate, which is put on top of it from calcium oxide, put the weighed sample and put on top of it again from calcium oxide, after which it is heated by placing it in a muffle furnace for two hours. We take a sample from the mufel and cool it and put it in a 100 ml flask and heat it for 40 minutes, then the sample is filtered and boiled for another 30 minutes, evaporated in electropech until 60 ml in the process, various ions precipitate in the form of salt, the sample is dissolved in hydrochloric acid and transferred to 100 ml probe measurement begins.

List of literature used

1. Сманова З.А. Сорбционно – фотометрическое определение меди на поверхности полимерного носителя. // Вестник НУУз, Ташкент, 20110. №4. С. 124 – 127.

2. Mirzakhmedov R.M, Madusmanova N.K., Sorbtsion-photometric determination of rhenium metal in zr and pb cake // Innovative, educational, natural and social sciences, 2022, P. 663-669.

3. Рузметов У., Усмоналиев Ж. Исследование некоторых техногенных отходов горно-металлургических комбинатов в Узбекистане. O‘zMU xabarlari. 2023 3/1. Стр.407-411

4. Mirzakhmedov R M., Jumayev M N., Imomnazarova K A, Tursunbayeva A., Sorbtion-photometric determination of zinc ion from the composition of industrial cake of non-ferrous metallurgical enterprises // Scholar's Digest- Journal of Multidisciplinary Studies. 2023.4 № 2. P 40-44.

5. Mirzakhmedov R.M., Madusmanova N.K., Sorbtsion-photometric determination of rhenium metal in zr and pb cake// Oriental Renaissance.2022 № 2. P. 663-669.

6. Мирзахмедов Р.М., Мадусманова Н.К., Сманова З.А., Сорбционно-фотометрическое определение иона рения с иммобилизованным органическим реагентом // Central Asian Journal of Theoretical and Applied Science. 2021№ 2. P. 89-93.