Sorbtsion-Spectroscopic Determination of Rhenium (III) Ion in Industrial Waste of "Olmalik Kmk " Jsc Using the Organic Reagent Bismutol-2

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ABSTRACT

It has been developed to find the mechanism of immobilization of the bismutol-2 Reagent to the carrier and to determine the optimal conditions and metrological properties of their formation of a complex with the rhenium (III) ion. 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: Rhenium (III) ions, bismutol-2, analytical reagent, immobilization, sorbtion-spectroscopic detection, buffer reagent, industrial waste technological cakes.

The tendency to expand the areas of application of rhenium, the availability of a raw material base and the development of modern technologies for its extraction makes it possible to expand the production of this valuable, valuable metal in Uzbekistan. In the Republic of Uzbekistan there are almost all sources of mineral raw materials, including raw materials containing rhenium.

The most stable compounds of rhenium in nature are chalcogenides, while disulfide rhenium is similar in physical properties and crystal lattice parameters to molybdenum and tungsten disulfide. In terms of its physicochemical properties, rhenium is closest to molybdenum, followed by platinum group metals, as well as W, Si, V, so, Ni, etc.

Rhenium is in great demand in metallurgy. At the end of the last century (1970-1980), the use of this metal had a positive effect on the growth of production. It has been added as an alloying element in high-temperature nickel alloys. Also, the production of platinum-rhenium catalysts for various purposes has been established on a large scale. To date, its use in various fields has increased several times. Despite the fact that rhenium belongs to refractory metals, it is still fundamentally different from other metals in this group. For example, it differs from tungsten in that it does not enter the cycle with water (in which the process of damaging the main part of vacuum lamps is mentioned in the Haki). This is the reason why a vacuum lamp produced with a rhenium element has a “long service life”. Surprisingly, it can serve for a whole century (100 years)

Rhenium is also used in the production of electronic devices and electrical engineering (thermocouples, anti-cathodes, semiconductors, electronic tubes, etc.The use of this element in the aerospace industry is no less important. Rhenium is used in the manufacture of lighting devices and electrical vacuum equipment. Semiconductors are not only made from it, but are also added to alloys, which are later used in the manufacture of Kerns-supports with a rotating frame.

Studying the optimal conditions for complex dressing of the rhenium (III) ion with the bismutol-2 Reagent

In the complex dressing of the rhenium ion with the reagent, the intensity of the wavelength of the complex was studied using the specrophotometer IV-ViS, pH, buffer mixture composition, organic solvent composition, concentration of organic reagent, injection procedure.

In the PM 7 semi-empirical method of the MOPAC program and the Gauss-Weiw methods, rhenium ion and oxide were placed in a heterohalca-approximated state and system-optimized, the perrenate anion as well as potassium cation in the 1st state were found to move away from the reagent molecule. In the case of rhenium oxide, however, it was observed that the rhenium atom approaches the nitrogen and sulfur atoms, that is, the coordination bond, the structure of the complex was brought in Appendix 1 in order to compare the results obtained.

In order to confirm the result obtained, the structure mechanism of the complex formed by the rhenium (III) ion with the bismutol-2 Reagent was studied using IQ-spectroscopy (Figure 1).

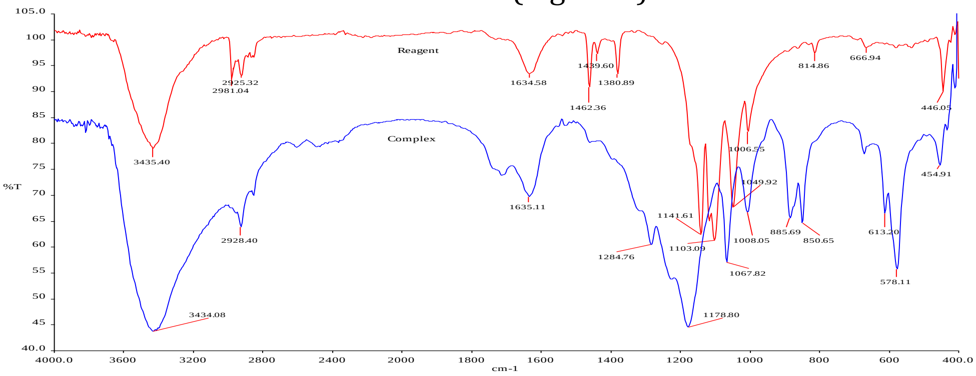

Figure 1. IR spectrum of rhenium (III) ion complex of bismutol-2 Reagent

Studies of the structure of the complex with an ik-spectral study and the chimism of complex dressing have shown that the bismutol-2 Reagent: The area of the group O-Me-, CH_2-, =N–N=, -C=S,-S-, Ar, –C≡N was found to be 454,9 sm^{-1}, 578,11 sm^{-1}, 613,20 sm^{-1}, 850,65 sm^{-1}, 885,69 sm^{-1}, 1178 sm^{-1}, 1635 sm^{-1}, the intensity of complex formation in the Sox, and the same reagent was used in subsequent work.

IR spectroscopic study of immobilized reagent and complex structure

The main change in the analysis of the IR spectrum of the metal ion of the organic reagent bismutol-2 to the polyanionite PPM-1 is the following groups, -2246 cm-1 belonging to the Group C≡N, =3424-3436 cm–1 belonging to the group N-H, –N–N= 1648-1651 cm-1 belonging to the Group C=S, and besides 500-750 cm-1 between chloranghydride, 2927 cm-1 for alkenes, C=S 792 cm-1 –C=O 1730 cm-1 exhibiting strong valence fluctuations in the experiment studied. It was also demonstrated that the polymer sorbent complex ppm-1 immobilized with rhenium (III) ion exhibits characteristic frequency corresponding to 469-590 CM -1 O-Re (result in Figures 2, 3, 4 and Table 1).

Table 1

PPM-1 results from the organic reagent bismutol-2 immobilized to the fiber and the IR-spectra of its rhenium (III) ion complex with the ion

Tola	C≡N	>C=N	N–H	NH_2Cl	–N–N=	C – N	CH_2 –	Ar	C=S	–C=O	O–Me	–CH_2–
PPM–1	2246 sm^{-1} intensive		3436 sm^{-1}		1648 sm^{-1}		2926 sm^{-1}	1090 sm^{-1}	792 sm^{-1}			2927 sm^{-1}
PPM–1+Me			3433 sm^{-1} intensive		1648 sm^{-1} low intensity	1641 sm^{-1} intensive	2928 sm^{-1} low intensity	1094 sm^{-1} intensive			592 sm^{-1}	
PPM–1+Reagent+Me	2245 sm^{-1} intensive		3424 sm^{-1} intensive		1654-1651 sm^{-1} intensive			1092 sm^{-1} intensive	790c sm^{-1} low intensity	1730 sm^{-1} intensive	469-590 sm^{-1}	

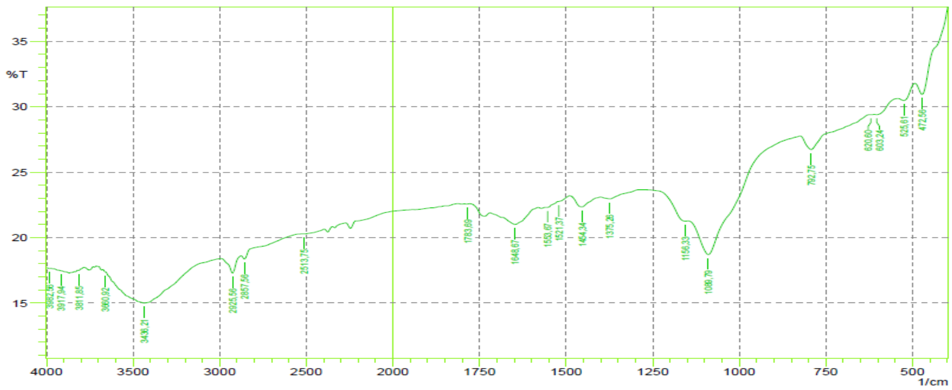

Figure 2. PPM-1 fiber IR spectrum obtained in experiment.

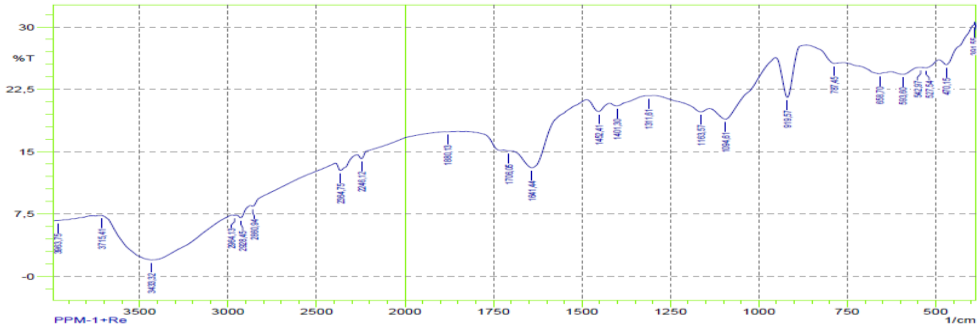

Figure 3. PPM-1 fiber with rhenium (III) ion-specific complexinig spectrum of IR obtained in the experiment.

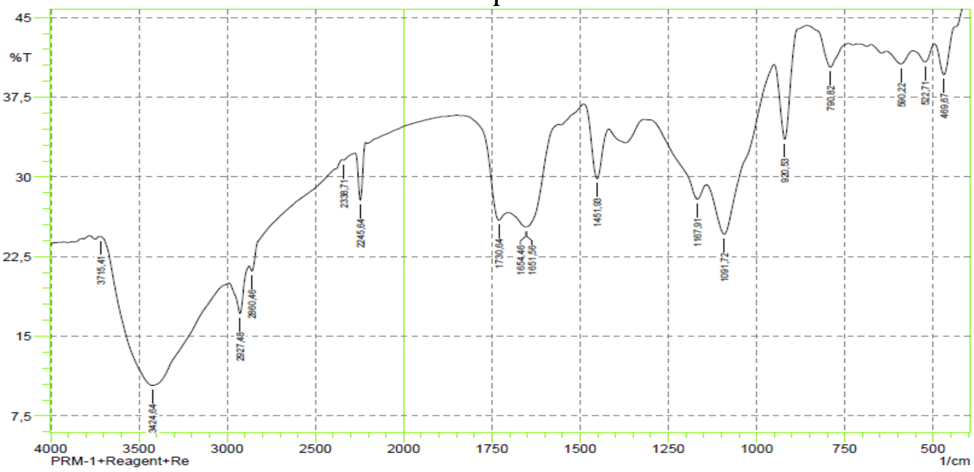

Figure 4. Immobilized PPM-1 is a complexinig IR-spectrum that binds the rhenium (III) ion to the fiber using the bismutol-2 Reagent.

The rhenium (III) ion complex identified using IR spectroscopy did not show holates belonging to the-on functional guru, and we witnessed that the main link went through the guruhas listed above.

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