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PRODUCTION OF METHODS FOR SORBTSION-SPECTROSCOPIC DETECTION OF RHENIUM ION FROM THE COMPOSITION OF INDUSTRIAL CAKE" OLMALIK KMK " JSC

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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: Rhenium (III) ions, bismutol-2, analytical reagent, immobilization, sorbtion-spectroscopic detection, buffer reagent, industrial waste technological cakes.

I. INTRODUCTION: The low content of rare metals in industrial waste is felt in the extensibility to sensitive methods. The elimination of such a flaw, however, has an important relevance in the development and evolution of modern physicochemical methods and their widespread use. In the Republic, a new way of extracting rare metals is carried out, including: a number of important measures are being taken to improve and introduce the complex state of ions of rare metals into synthetic sorbents and organic reagents.

The copper mine of Uzbekistan (Olmalık Shahri) has a capacity of 4,640.8 million. contains tons of ore. These ores contain 371,268 tons of molybdenum in molybdenum, up to about 60 g/t according to the census. Rhenium and molybdenite are on average 1350 g/t. Thus there are 495 tons of rhenium reserves in molybdenite. The cost of 1 kg of rhenium is 1500 Dollor, its reserve value is 742500 thousand Dollor. It makes it possible to expand the production of this valuable, precious metal in Uzbekistan.

Spectral descriptions have been identified using photometric reagent diketohydrindiamine to detect rhenium and molybdenum, and the effects of foreign ions have been studied, stoichiometric magnitudes have been calculated, and a photometric method with Sr=0.3 has been developed for pharmacological chemistry.

Fluorine complex compounds are characterized by the oxophthoride complex of rhenium Re^{6+} oxidation states from the BrF_3 interaction of $KReO_4$ from $K_2ReO_2F_4$ and perrenate potassium, rubidium, caesium silver and barium from anionic salts ReO_2F_4, respectively, and Me_2ReF_8 for Re^{6+} oxidation states. $MeReF_7$-containing complexes have been studied.

Polyvolphramphenylsiloxanes(PVFS) have been selectively isolated sorbent Re(VII) from Mo(VI), and sorption selectivity over ReO_4^- ions has been shown to be 200 times higher than the 6 times molar content of Mo (VI) ions.

II. GENERAL METHODOLOGY OF WORK

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 using the specrophotometer IV-ViS, pH, buffer mixture composition, organic solvent composition, concentration of organic reagent, injection procedure were studied. The mechanics of the analytical reaction of the rhenium ion with the bismutol-2 Reagent have been studied, and the results are given in Figure 1 and table 1.

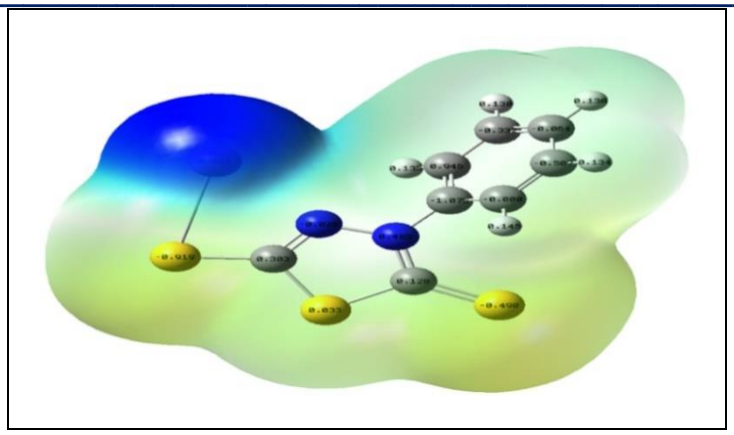

Figure 1. Structure formula of reagent in quantum-chemical methods in the Gaussian application of bismutol-2 Reagent

Table 1.
Quantum-chemical calculation work in the Gaussian program of the reagent bismutol-2

Gaussian Calculation Summary			
Calculation Method		RB3LYP	
Basis Set		6-311+G(D,P)	
Electronic Energy		-2212.109198	Hartree
		-60194.58601835 eV	
		-1388119.775758 kkal/mol	Positive space
RMS Gradient Norm		0.000009	Hartree/Bohr
Dipole Moment	12.441049	Debye	

Reagent's quantum-chemical calculation work was carried out in the Gaussian program using the base set 6-311+G(D,P) in the RB3LYP method:

The results showed that the wavelength of the bismutol-2 organic reagent complex with the rhenium (III) ion has a maximum optimal optical density of λ_k=450 nm.

Based on the results of the calculation, the probability of binding a metal atom to the reagent was studied in chemical methods (result Figure 2). In the case of rhenium oxide, however, it was observed that the rhenium atom approached the nitrogen and sulfur atoms, that is, co-ordinated bond, the structure of the complex was compared with other methods in order to compare the results obtained.

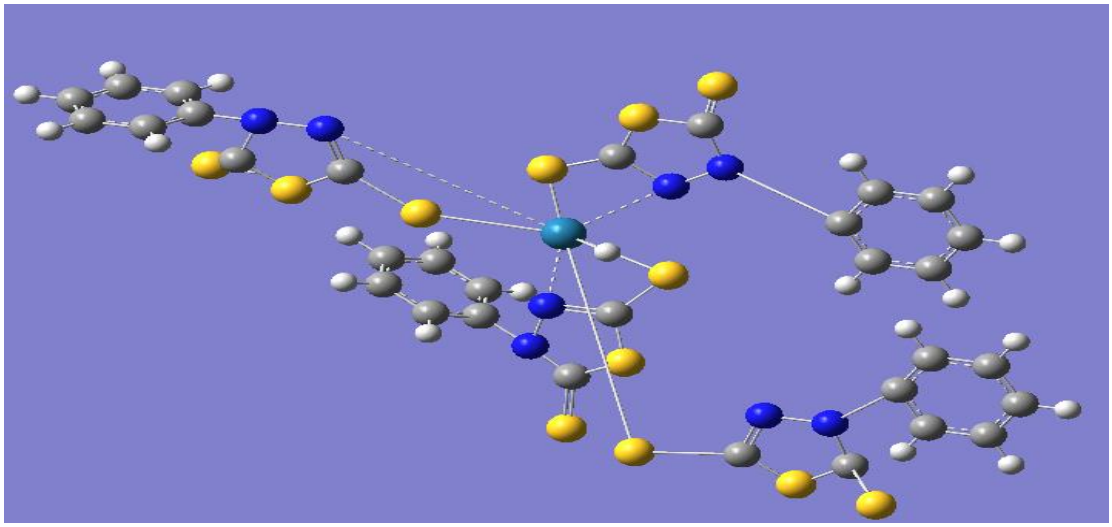

Figure 2. Gauss was able to detect the rhenium ion using Wiew methods in a state approximated to nitrogen, sulfur atoms.

In Figure 1 and 2, it was found that the PM 7 semi-empirical method of the MOPAC program and the Gauss-Weew methods used rhenium ion and oxide were placed in a heterohalca-approximated state and optimized the system, moving the perrenate anion and potassium cation away from the reagent molecule in the 1st state.

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