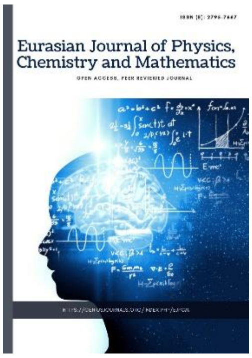

Determination of the Complex Composition by the Method of Isomolar Series

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ABSTRACT

This paper describes experimental methods for the separation of nickel ions from the adsorbent using dimethylglyoxime in the regeneration of adsorbents.

Keywords: Ni (II) ions, activated carbon adsorbent, spent MDEA solution, Chugaev reagent, pH

Introduction

Activated coals are widely used in the separation and purification of gases, as well as in the recovery of volatile organic solvents. In the purification and bleaching of solutions can be used various micro-pores - sorbents such as silica gel, natural and synthetic zeolites, aluminium, porous glasses, ion exchangers and activated charcoals. Activated charcoals are obtained by carbonization and activation of biological, mainly plant-derived organic matter [1-4]. As raw materials, various wood materials, peat, coal mined at different stages (brown coal, coal, anthracite), cotton and sunflower husks, walnut husks and fruit twigs, animal bones, waste from hydrolysis (lignin) and sugar (syrup) industry, polymer resins and other carbon-retaining materials are used. In terms of size and shape, activated charcoals are divided into granular and pulverized [5-9].

The main part

Granulated coals are usually made in the form of cylinders with a diameter of 2-5 mm, with the height of the cylinders always greater than the diameter. Granulated coals are mainly used in devices as a stationary layer in the treatment and separation of process flows in the gas phase [10-14]. To increase the intensity of mass transfer, the granulated coals are ground and small fractions are obtained after sieving, for example: 0.15 - 0.25; 0.25 - 0.55; 0.55 - 1.65; 1.65 - 2.35 mm. The crushed coal is used in all types of adsorption processes, both in the gas and liquid phases. Powdered coals are composed of particles smaller than 0.15 mm. They are used to clean substances in the liquid phase [15-18]. Depending on their use, coals are divided into gas, recuperative and bleaching types. Gas coals are designed to capture poorly sorbed components or vapours that are present in small concentrations of gases. Gas stoves should have mainly large porosity as well as advanced myelopoiesis. Recuperative coals. The smallest pores in these coals may be open to the entry of vapours of substances with a molecular mass of 150. Bleaching charcoals are designed to absorb large molecules or microemulsions from liquid media. They are distinguished by their developed myopathy.

The radius of the pores is in the range of 1000-2000A, which in turn exceeds the size of the sorption molecules. The average radii of the micro-pores are below 15-16 A. The size of the pores is the same as the size of the adsorbed molecules.

Adsorbents used in adsorption devices must meet many requirements:

– Must have a high adsorption capacity (in the gas or liquid phase it absorbs large amounts even at low concentrations);
– Must have high selectivity (absorbing only one ingredient from the mixture);
– The compounds to be separated must be chemically inert relative to the components;
– Must have high mechanical strength;
– Must have the regenerative capacity for subsequent reuse (restoration of initial adsorption properties);
– The price should be lower.

Activated coals are distinguished by high mechanical strength, hydrophobicity and other properties and have many properties, which can be exemplified by the developed specific layer and porous structure. One of the disadvantages of activated carbon as an industrial adsorbent is its flammability. Oxidation of coals in the air begins at temperatures above 250 ºC. [3]. The mole ratios of the components in the complex formed by nickel (II) with the dimethylglyoxime reagent were determined by the isomolar series method. Equivalent concentrations of nickel (II) and dimethylglyoxime reagents were used to determine the ratio of moles in the complex of nickel (II) with dimethylglyoxime reagent by the method of isomolar series:

$C_{Ni2+} = C_{HR} = 2.0446 \cdot 10^{-5} mol / l$

Method of determination: A series of solutions were prepared in 25 ml volumetric flasks. To do this, add to each of a variable amount of nickel (II) solution (up to 9.0-1.0 ml), add a solution of dimethylglyoxime reagent solution (up to 1.0 ml-9.0 ml) and a universal with a pH of 8. dilute and mix with distilled water to the mark of the tube, adding 5.0 ml to each of the buffer solutions. The optical density of the prepared solutions was measured in KFK-2 at a light filter at 550nm, relative to the specific solution in cuvettes with a light absorption thickness of 1 = 1.0 cm. The results obtained are presented in Table 1

Table 1. Results of the study of the composition of a complex compound using the method of isomolar series

№	Obtained Ni (II), ml	Obtained Vnr, ml	Buffer solution	Ă
1.	9.5	1.5	5.0	0.007
2.	8.5	2.5	5.0	0.08
3.	7.5	3.5	5.0	0.165
4.	6.5	4.5	5.0	0.30
5.	5.5	5.5	5.0	0.34
6.	4.5	6.5	5.0	0.39
7.	3.5	7.5	5.0	0.45
8.	2.5	7.0	5.0	0.50
9.	2.0	8.0	5.0	0.43
10.	1.0	9.0	5.0	0.33

It can be seen from this table that the composition of the complex formed by the dimethylglyoxime reagent with Nickel (II) corresponded to the molar ratio of Ni: R = 1: 2. Determination of the real molar quenching coefficient and equilibrium constant of the complex of nickel (II) with dimethylglyoxime reagent by Tolmachyov's graphical method. determined by the method. All the above results (Ni: R = 1: 2) were taken into account when working with this method. The reaction equation for Ni (II) with dimethylglyoxime reagent can be described as follows.

Determination method: 25 ml measuring tubes were filled with a stoichiometric ratio of reactive reagent and nickel (II) solution and 5.0 ml of buffer mixture with pH I 8.0 and diluted to the mark with distilled water. Optical density was measured at KFK-2 at 6 n.f., relative to the specific solution in cuvettes with light absorption thickness l = 1.0 cm. The results are presented in Table 5.

Table 2. Results of determination of real molar extinction coefficient and equilibrium constant of the complex by Tolmachyov's graphical method

№	V Ni + 2, ml	VHR, ml	S Ni 2+ · 10-	Ă	$\sqrt{Ă}$	$\frac{1}{}\sqrt{Ă}$	E	1 / e
1.	0.25	0.5	0.075	0.774	3,649	1,022	7338.5	1.36
2.	0.50	1.5	0.100	0.316	3.164	2,044	4892.36	2.04
3.	0.75	2.5	0.128	0.358	2,793	3,066	4174.48	2.40
4.	1.00	3.5	0.157	0.394	2,538	4,088	3791.58	2.64
5.	1.25	4.5	0.160	0.400	2,590	5.11	2622.95	3.13
6.	1.50	5.5	0.180	0.424	2,350	6.13	2517.48	3.40

Tolmachyov's graphical method formula for the real molar extinction coefficient and equilibrium constant of a complex [2]:

[1 / e = f (1 / $\sqrt{A}$)] (3)

The following formulas were used in the calculations:

εhaq = 1/1 / $\varepsilon \cdot 10 - n$ = 1 / 0,136 ∗ 10−4 = 7,52 * 10 -4 (4)

εhaq.-the actual molar extinction coefficient of the complex;

Compared to the calculated numerical values, the developed method was shown to have a much higher sensitivity, while the complex compound had average stability.

According to the results obtained, the solution of dimethylglyoxime, used as a reagent, gave good results in the formation of a complete complex of nickel ions in the adsorbent used. According to the spectral characteristics of this complex, the absorption spectrum was measured in a quartz cuvette with a light absorption thickness l = 1.0 cm relative to the specific solution, on a spectrophotometer SF-46. The absorption spectrum of the reagent was obtained with respect to distilled water. Results The maximum absorption area of the Ni (II) complex of the dimethylglyoxime reagent located at lkomp = 550 nm, the maximum absorption region of the dimethylglyoxime reagent was observed in the region of shorter spectral waves i.e. at reagent = 470 nm.

References

1. Fayzullaev, O., Turobov, N., Ro‘ziyev, E., Quvatov, A., Muxammadiev, N.," (2006). Analitik kimyo. Laboratoriya ishlari. "Yangi avlod" NMM.
2. Allen H. E., Miner R. Metall ionlari V: (1982). Ifloslanishni nazorat qilish uchun suv tadqiqotlari - fizik-kimyoviy va radiologik tadqiqotlar. Ed. M. J. Muvaffaqiyat, Oksford, c 41.
3. Sugunadevi S. R., Satishkumar M., Shanti K., Kadirvelu K, Pattabxi S. (2002). Hindistonning J. Environ protesti, p 500-505.
4. Содиков, У. Х., & Жумабоев, А. Г. (2019). Получение оксигенатно-углеводородной смеси целевым назначением. *Universum: технические науки*, (11-2 (68)), 65-68.
5. Жумабоев, А. Г., & Содиқов, У. Х. (2020). Технологический процесс получения углеводородных фракций из возобновляемых сырьевых материалов. *Universum: технические науки*, (1 (70)).
6. Содиқов, У. Х., & Полвонов, Х. М. (2020). Ўқитишнинг замонавий усуллари. *International Journal Of Discourse On Innovation, Integration And Education*, *1*(5), 205-207.
7. Жумабоев, А. Г., & Содиков, У. Х. (2020). Разработка схемы использования поглотителя при нейтрализации «кислых газов», образующихся при сжигании кокса в катализаторе блока каталитического риформинга. *Universum: технические науки*, (10-2 (79)), 73-76.
8. Нумонов, М. А. У., & Содиқов, У. Х. (2020). Извлечение донаксина из растения Arundo donax. L и синтез его

производных на основе донаксина. *Universum: технические науки*, (8-3 (77)), 39-42.
9. Ортикова, С. С., Хокимов, А. Э. У., & Нурматова, З. Н. К. (2019). Изучение химического состава аммофосфата, полученного на основе фосфорнокислотной переработки забалансовой фосфоритной руды Центральных Кызылкумов. *Universum: химия и биология*, (12 (66)).
10. Жумабоев, А. Г., & Содиков, У. Х. (2021). Очистка дымовых газов от диоксида углерода из промышленных выбросов и его утилизация. *Universum: химия и биология*, (10-1 (88)), 17-19.
11. Fayziyev, P. R., Ikromov, I. A., Otaboyev, N. I., & Abduraximov, A. A. (2022). The Analysis of Gas Balloon Supply Systems. *Eurasian Journal of Engineering and Technology*, *4*, 115-122.
12. Жумабоев, А. Г., & Содиков, У. Х. (2021). Усовершенствовани Переработки Газового Конденсата И Производства Импортозамещающей Продукции. *Central Asian Journal Of Theoretical & Applied Sciences*, *2*(12), 369-373.
13. Ubaydullaeva, S. B., & Sodikov, U. X. (2022). Determination of the Optimal Conditions of t he Bond of Nickel (II) Ion Complex with Dimethyl glyoxime Reagent. *Eurasian Research Bulletin*, *8*, 1-5.
14. Saidakhon, U., Usmonali, S., Nozima, Y., & Amirov, A. (2022). Selection of optimal conditions for complex combination of nickel (II) ion with dimethylglyoxime REAGENT. *American Journal Of Applied Science And Technology*, *2*(04), 29-34.
15. Fayziyev, P. R., Ikromov, I. A., Abduraximov, A. A., & Dehqonov, Q. M. (2022). Timeline: History of the Electric Car, Trends and the Future Developments. *Eurasian Research Bulletin*, *6*, 89-94.
16. Файзиев, П. Р., Исмадиёров, А., Жалолдинов, Г., & Ганиев, Л. (2021). Солнечный инновационный бытовой водонагреватель. *Science and Education*, *2*(6), 320-324.
17. Fayziyev, P. R., Ikromov, I. A., Abduraximov, A. A., & Dehqonov, Q. M. (2022). Organization of technological processes for maintenance and repair of electric vehicles. *International Journal of Advance Scientific Research*, *2*(03), 37-41.
18. Fayziyev, P. L. R., O‘G, G. O. U. B., & Jaloldinov, L. (2021). Avtomobil texnikalariga servis xizmat ko ‘rsatishning bosqichlari. *Academic research in educational sciences*, *2*(11), 1114-1120.