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KIMYO / ХИМИЯ / CHEMISTRY

4. Kunyon R.L., Hasek R.H., Davy L.G., Broadbooks K.J. Oxidation of cellulose // Ind. Eng. Chem. 1949. Vol. 41, N1. Pp. 2-8.

5. Kachmazov A.A., Zhernov A.A. Methods of hemostasis and use of preparations from oxidized reduced cellulose in renal resection//Experimental and clinical urology. 2010. №. C. 68-71

6. Shin F.E., Tolstoy M.P., Starichkov I.G., Rybasov P.I., Vorotilov Yu.V., Mammadov N.I. New in the treatment of purulent wounds//Moscow Surgical Journal. 2011. № (18). C 51-54.

7. Zhu., Kumar V., Banker G.S. Examination of aqueous oxidized cellulose dispersions as a potential drug carrier: II. In vitro and in vivo evaluation of phenylpropanolamine release from microparticles and pellts // AAPS PharmSciTech 2004. N5 (4). Pp. 145-152.

8. Martina B., Katerina K., Miloslava R., Jan G., Ruta M. Oxycellulose: signifincant characteristics in relation to its pharmaceutical and medical applications // Advances in Polymer Technology. 2009. Vol. 28, N3. Pp. 199-208.

9. Liu S.-A., Cheng C.-C., Chen J.-S., Hung Y.-W., Cheng F.-J., Chen Y.-T. Effect of oxidized regenerated cellulose on the healing of pharyngeal wound: An experimental animal study // Journal of the Chinese Medical Association. 2012. Vol. 75. Pp. 176-182.

10. He J.-M., Wang F.-W., Wu Y.-D., Gu H.-B., Huang Y.-D., Zhang H.-W. Progress in functional modification of typical biomedical absorbable hemostatic agents // Xiandai Huagong [Modern Chemical Industry]. 2010. Vol. 30, N12. Pp. 11-15.

11. Rogovin Z.A., Shorygina N.N. Chemistry of pulp and its satellites. M, 1953. 292 c.

12. Dineen P. Te effect of oxidized regenerated cellulose on experimental infected // splenectomies// J. Surg. Res. 1977. Vol. 23, N2. Pp. 114-125.

13. Dineen P. Te effect of oxidized regenerated cellulose on experimental intravascular infection // Surgery. Res. 1977. Vol. 82, N5. Pp. 576-579.

14. Han Yanga , Yefei Zhanga , Ryo Katoa, Stuart J. Rowana, Preparation of cellulose nanofibers from Miscanthus x. Giganteus by ammonium persulfate oxidation. 2019. Pages 30-39

15. Jie, J., Chen H., Liu L., Yu J., Fan Y, Saito T, Akira I. Influence of chemical and enzymatic TEMPO-mediated oxidation on chemical structure and nanofibrillation of lignocellulose. ACS sustainable Chemistry & Engineering 8 (37), 2020.

16. Chalupová M. et al. Local tissue reaction after the application of topical hemostatic agents in a rat partial nephrectomy model //Journal of Biomedical Materials Research Part A. - 2012. - T. 100. - №. 6. - C. 1582-1590.

17. Takács I. et al. Efficacy of different hemostatic devices for severe liver bleeding: a randomized controlled animal study // Surgical innovation. - 2010. - T. 17. - №. 4. - C. 346-352.

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MAHALLIY XOMASHYOLAR HAMDA CHIQINDILAR ASOSIDA OLINGAN IONITGA Cu^{2+} IONLARINING SORBSIYA IZOTERMASI

N.M.Qutlimuratov[1], M.M.Jo‘raev[1], O.X.Tursunmuratov[1], D.J.Bekchanov[2], M.G.Muxamediev[2]

[1]Toshkent viloyati Chirchiq davlat pedagogika instituti

[2] Mirzo Ulug‘bek nomidagi O‘zbekiston Milliy Universiteti

Annotatsiya. Ushbu maqolada polivinilxlorid (PVX) va chiqindilar asosida olingan, kuchsiz asos xossasini namoyon qiluvchi ionitga sun’iy eritmalardagi Cu^{2+} ionlarining sorbsiyasi 298K haroratda, sorbsiya davomiyligi muvozanat holatigacha (18-soat) va turli konsentratsiyalarda o‘rganish natijalari keltirilgan. Jarayonlarning muvozanat holatidagi adsorbsiya mexanizmini ifodalash uchun Lengmyur, Flori-Haggins, Freyndlix, Temkin va Dubinin-Radushkevich izoterma modellaridan foydalanildi. Olingan natijalar asosida hisoblab topilgan izoterma parametrlari R^2(0,774-0,987) qiymati barcha izoterma modellarida mos kelganligi aniqlandi. Lengmyur izoterma modeli bo‘yicha q_{max}= 109,9 mg/g, Flori-Xaggins izoterma modeli bo‘yicha ΔG_{ads}=-20,314 kDj/mol, Freyndlix izoterma modeli bo‘yicha n= 2,865, Temkin izoterma modeli bo‘yicha B_T =120,3 J/mol, Dubinin-Radushkevich izoterma modeli bo‘yicha B_D=2,14•10^{-2} kJ/mol•K va E_a= 4,84 kJ ekanligi kelib chiqdi. Bu esa polivinilxlorid hamda chiqindilar asosida tarkibida azot saqlagan yangi ionitga Cu^{2+} ionlarini yuqori darajada sorbsiyalashini ko‘rsatadi.

Kalit so‘zlar: polivinilxlorid (PVX), ionit, mis ionlari(Cu^{2+}), sorbsiya, Lengmyur, Flori-Haggins, Freyndlix, Temkin va Dubinin-Radushkevich va izoterma.

Sorption isotherms Cu^{2+} ions on the ionite obtained from local raw materials and wastes

Abstract. In this paper, the sorption of Cu^{2+} ions in artificial solutions of polyvinyl chloride (PVC) and nitrogen-containing ion exchange residues based on waste was studied at 298K, the duration of sorption up to equilibrium (18 hours), at different concentrations. Langmuir, Flory-Huggins, Freundlich, Temkin, and Dubinin-Radushkevich isothermal models were used to represent the adsorption mechanism based on equilibrium processes. Based on the results obtained, it was determined that the value of the calculated isotherm parameters R^2 (0,774 - 0,987) was consistent in all isotherm models. q_{max}=109.9 mg/g according to Langmuir isotherm model, ΔG_{ads}=-20,314 KJ/mol according to Flory-Huggins isotherm model, n=2,865 according to Freundlich isotherm model, B_T=120.3 Dj/mol according to Temkin isotherm model, According to the Dubinin-Radushkevich isotherm model, B_D = 2.14•10^{-2} KJ/mol•K and E_a=4,84 KJ. This indicates a high sorption of Cu^{2+} ions into a new ionite containing nitrogen on the basis of polyvinyl chloride and waste.

Keywords: polyvinyl chloride (PVC), ionite, copper ions (Cu^{2+}), sorption, Langmuir, Flory-Huggins, Freundlich, Temkin, Dubinin-Radushkevich and isotherm.

Изотермы сорбции ионов Cu^{2+} на ионите, полученном из местного сырья и отходов

Аннотация. В данной работе представлены результаты исследования сорбции ионов Cu^{2+} в искусственных растворах при температуре 298K, длительности сорбции до равновесия (18 часов) и при различных концентрациях азотсодержащих слабоосновных ионитов, полученному на основе поливинилхлорида (ПВХ) и отходов. Для выражения механизма адсорбции процессов в равновесном состоянии были использованы изотермические модели Ленгмюра, Флори-Хаггинса, Фрейндлиха, Темкина и Дубинина-Радушкевича. Установлено, что значения расчетных параметров изотермы R^2 (0,774-0,987) совпадают во всех моделях изотерм. Q_{max}=109,9 мг/г по модели изотермы Ленгмюра, $\Delta G_{адс}$=-20,314 кДж/моль по модели изотермы Флори-Хаггинса, n=2,865 по модели изотермы Фрейндлиха, B_T=120,3 Дж/моль по модели изотермы Темкина, Согласно модели изотермы Дубинин Радушкевича B_D = 2,14 • 10^{-2} кДж/моль; K и E_a=4,84 кДж соответственно. Это свидетельствует о высокой сорбционной способности новых азотсодержащих ионитов на основе поливинилхлорида и отходов по отношению к ионам Cu^{2+}.

Ключевые слова: поливинилхлорид (ПВХ), ионит, ионы меди (Cu^{2+}), сорбция, Ленгмюр, Флори-Хаггинс, Фрейндлих, Темкин, Дубинин-Радушкевич и изотерма.

Kirish

Bugungi kunda, suv resurslari va tuproq sistemasining sho‘rlanish darajasi oshib bormoqda. Shuning bilan birgalikda, sanoat korxonalaridan chiqayotgan oqova suvlari tarkibida turli anion va kationlarni ko‘p miqdorda saqlaganligi sababli, oqova suvlari oqar suvlarga qo‘shilishi natijasida tabiiy suvlar tarkibida turli zararli ionlar tarqalishiga sabab bo‘lmoqda. Oqova suvlari tarkibidagi turli anionlar va kationlar hududning flora va fauna sistemalarining ko‘payishiga va rivojlanishiga salbiy ta’sir ko‘rsatib, hududning ekolgik holatining yomonlashishiga olib kelmoqda. Bu esa oqova suvlari tarkibidagi zararli ionlar, qishloq-xo‘jaligi maxsulotlarining hosildorligini kamayishiga va hosil tarkibida zararli moddalarning yig‘ilishiga olib keladi. Bundan tashqari chiqindi suvlar tarkibidagi turli zaxarli ta’sirga ega ionlarning konsentratsiyasini ekoligik me’yorlargacha kamaytirish ham dolzarb sanaladi. Bu muammolarni bartaraf qilish bugungi kunda kimyogarlar oldida turgan vazifalardan biri bo‘lib qolmoqda[1]. Hozirgi vaqtda suvni tozalashning turli xil texnologik usullar qo‘llanib kelinmoqda, jumladan kimyoviy ishlov berish, fizik, biologik va boshqa usullardan ionitlar ishtirokida adsorbsiyalash usuli keng qo‘llaniladi. Bu usulning ishlash jarayoni oddiyligi, ekologik va iqtisodiy samarali, qayta ishlash imkonini berishi bilan boshqa usullardan ustun turadi. Respublikamiz sanoat korxonalarida ishlatiladigan sorbentlar chet eldan import qilinadi. Shuning uchun mahalliy xomashyolar asosida ionitlar olish va fizik-kimyoviy xossalarini o‘rganish orqali oqova suvlarni tozalashga qo‘llash dolzarb va katta amaliy ahamiyatga ega. Jahon miqyosida olimlar tomonidan yangi ionitlarning sorbsion xossalari baholashda kinetik va termodinamik tahlillardan keng foydalaniladi.

Xususan, ushbu ish yuqorida kelirilgan dolzarb muammoni ma’lum darajada hal qilishga qaratilgan bo‘lib, maxalliy xomashyolar asosida olingan ionit, Cu^{2+} ionlarinig sun’iy eritmalarida sorbsiyasini o‘rganishda Lengmyur, Flori-Haggins, Freyndlix, Temkin va Dubinin-Radushkevich izoterma modellaridan foydalanildi[2-3].

Materiallar va metodlar

Statik almashuv sig‘imi HCl bo‘yicha 3,8 mg•ekv/g bo‘lgan polivinilxlorid asosida tarkibida aminoguruh tutgan ionitdan 3 g/l miqdorda olindi va unga Cu^{2+} ionlari saqlagan sun’iy eritmalari 100 ml 298 K haroratda, muvozanatga kelguncha (18 saotgacha) sorbsiya jarayoni o‘rganildi. Sorbsiya jarayonidan oldingi va keyin eritmadagi Cu^{2+} ionining konsentratsiyasini o‘zgarishi Spektrofotometr (EMC-30PC-UV Spectrophotometr) pribori yordamida optik zichligining o‘zgarishiga qarab, optik zichliknmng konsentratsiyaga bog‘liqlik (1) tenlamasidan konsentratsiya o‘zgarishlari hisoblab topildi.

$$A= C•\varepsilon•l \quad (1)$$

Sorbsiya miqdori quyidagi (2) formula orqali hisoblandi[4]:

$$q_e = \frac{(C_0 - C_e)}{m} \times V \quad (2)$$

Bunda: q_e-ionitga yutilgan metall ioni miqdori mg/g, C_0-metall ionlarining dastlabki konsentratsiya mg/l, C_e metall ionlarining muvozanat konsentratsiyasi mg/l; V -eritma hajmi (l); m-quruq sorbent massasi(g).

Lengmyur izotermasi modeli quyidagi(3) tenglama bilan ifodalanadi[4].

$$q_e = q_{\max} \frac{K_L C_e}{1+K_L C_e} \quad (3)$$

Bu erda: q_{max} - ma’lum massali sorbentga yutilgan metalning maksimal miqdori (mg/g).

Lengmyur tenglamasini (4) tenglamada keltirilgan chiziqli ko‘rinishidan foydalanib, q_{max} va K_L qiymatlarini C_e/q_e ning C_e bog‘liqlik grafigidan kesishish qiyaligining burchak qiymati orqali topiladi.

$$\frac{C_e}{q_e} = \frac{1}{q_e K_L} + \frac{1}{q_{\max}} \cdot C_e \quad (4)$$

q_{max} va K_L qiymatlaridan ajratish koefitsenti (R_L)ni hisoblash mumkin. Muvozanat parametri R_L yordamida sorbat va sorbent o‘rtasidagi yaqinlikni taxmin qilish uchun ishlatish mumkin.

$$R_L = \frac{1}{1 + K_L \cdot C_0} \quad (5)$$

Bunga (5) ko‘ra 0< R_L <1 adsorbsiya jarayoni qulay, R_L >1 noqulay, R_L = 1 adsorbsiya izotermasi chiziqli ko‘rinishda deb xisoblanadi va R_L=0 esa adsorbsiyani qaytmas bo‘lishini ifodalaydi.

Freyndlix izoterma modeli quyidagi (6) tenglama bilan ifodalanadi:

$$q_e = K_F {C_e}^{1/n} \quad (6)$$

Freundlich izoterma tenglamasi yordamida turli (ideal bo‘lmagan) eritmalarda boradigan sorbsiya jarayonlarini o‘rganish mumkin. Ushbu modelning chiziqli tenglamasini quyidagi(7) ko‘rinishda ifodalash mumkin[5].

$$\log q_e = \log K_F + \left(\frac{1}{n}\right) \log C_e \quad (7)$$

Bu (7) tenglamada: K_F- Freundlich konstantasi, $1/n$-sorbsiya intensivligi. Freundlich konstantalari K_F va n ($n \approx$ 1-10; $1/n \approx$0-1) qiymatlarini $Log\ q_e$bilan $Log\ C_e$ chiziqli grafigida kesishish qiyaligining burchak qiymati orqali topiladi.

Temkin izoterma modelining chiziqli tenglamasini (8) quyidagicha ifodalanadi[6]:

$$q_e = \frac{RT}{b_T} • lnK_T + \frac{RT}{b_T} • lnC_e \quad (8)$$

K_T- Temkin izoterma konstantasi (A_T)- (l/g)

b_T- sorbsiyaning haroratga bog‘liqlik konstantasi- (J/mol)

q_e bilan lnC_e bog‘liqlik grafigidan $K_T\ va\ b_T$ konstantalarni topish orqali, sorbsiya jarayonining haroratga bog‘liqligi haqida fikr yuritishga imkon beradi.

Dubinin-Radushkevich izoterma modelining chiziqli tenglamasini (9) quyidagicha ifodlanadi[7]:

$$ln\ q_e = ln\ Q_D - 2B_D • RT • ln\left(\frac{1}{C_e} + 1\right) \quad (9)$$

Q_D- sorbentning nazariy maksimal sig‘imi (mol/g);

B_D- Dubinin-Radushkevich izoterma konstantasi (kJ/mol•K);

E- sorbsiyaning o‘rtacha energiyasi (kJ/mol).

$ln\ q_e$bilan $ln\left(\frac{1}{C_e}+1\right)$ bog‘liqlik grafigidan $Q_D\ va\ B_D$ konstantalarni topish orqali, sorbsiya jarayonining o‘rtacha energiyasini (10) tenglamadan topishimiz mumkin[8].

$$E = 1/\sqrt{2B_D}\ (10)$$

Flori-Haggins izoterma modelining umumlashgan va chiziqli tenglamalari (11-12) quyidagicha[9]:

$$C_0 = \frac{\theta}{K_{FH} \bullet (1-\theta)^n}\ (11)\ log\frac{\theta}{C_o} = \log K_{FH} + n \bullet \log(1-\theta)\ (12)$$

θ- ionning sorbent g‘ovaklarida qoplanish darajasi (harakat zonasi);

n- sorbsiya markazidagi metall ionlarining miqdori;

K_{FH}-Adsorbsiyaning muvozanat konstantasi;

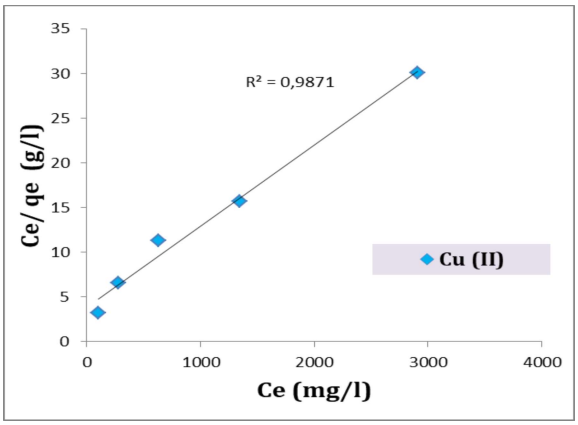
ΔG_{ads} - Adsorbsiyalanish jarayonining erkin energiyasi.

$\log(1-\theta)$ bilan $log\frac{\theta}{C_o}$ bog‘liqlik grafigidan $n\ va\ K_{FH}$ konstantalarni topish orqali, adsorbsiya jarayonining erkin energiyasini hisoblashga (13) zamin yaratadi[4,10].

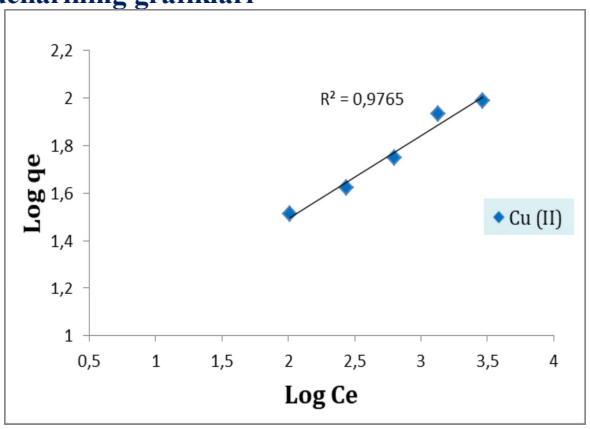
$$\Delta G = -RTln_{KF}\ (13)$$

Adsorbsiya jarayonlaridagi muvozanat holatidagi izotermasini o‘rganish natijalari quyidagi (a,b, d, e va f) grafikda keltirilgan :

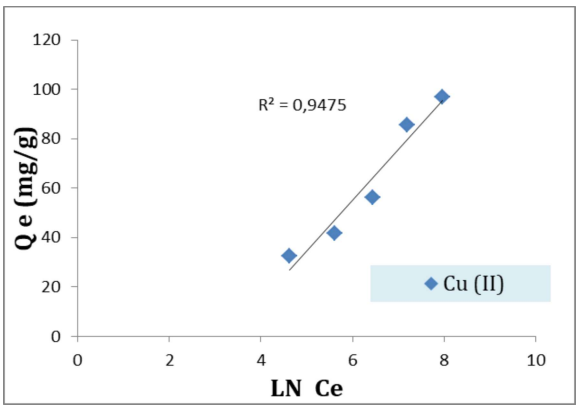
Barcha izoterma modellarining grafiklari



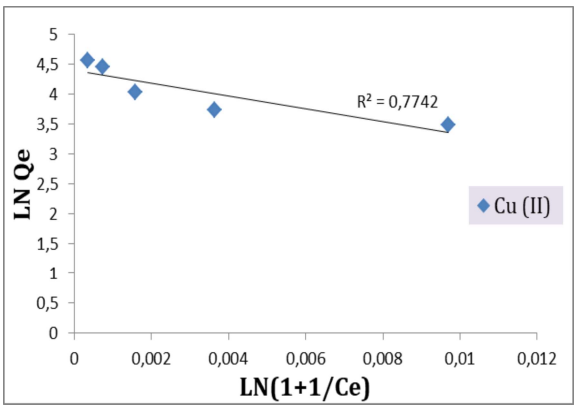
a-
Lengmyur izoterma modeli



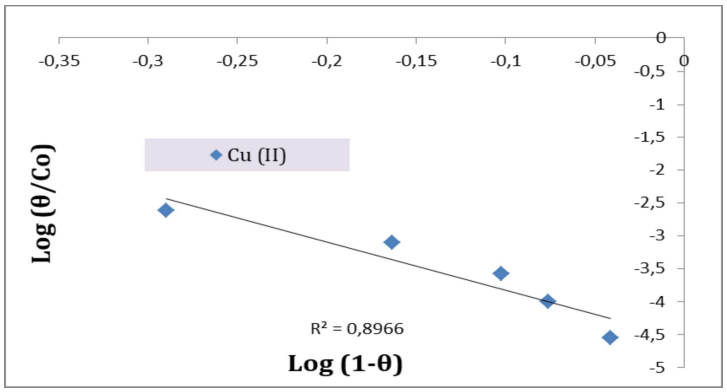
b-
Freyndlix izoterma modeli



d-
Temkin izoterma modeli



e-
Dubinin-Radushkevich izoterma



f-

Flori-Haggins izoterma modeli

Yuqoridagi izoterma modellar asosida tuzilgan grafiklarlaridan quyidagi natijalar olindi:

Cu^{2+} ionining yutilish izotermasi			
№	Izoterma parametrlar	Qiymatlar	Birliklar
Lengmyur izoterma modeli			
1.	q_{max}	109,9	mg/g
2.	K_L	$3,4•10^{-2}$	L/g
3.	R_L	0,01-0,127	qulay
4.	R^2	0,987	
Flori-Haggins izoterma modeli			
5.	N	1,9654	
6.	K_{FH}	35,661	
7.	ΔG_{ads}	-20,314	KJ/mol
8.	R^2	0,897	
Freyndlix izoterma modeli			
9.	1/n	0,349	
10.	n	2,865	
11.	K_F	6,214	
12.	R^2	0,977	
Temkin izoterma modeli			
13.	K_T	$3,55•10^{-2}$	L/g
14.	B_T	120,3	J/mol
15.	R^2	0,948	
Dubinin-Radushkevich izoterma modeli			
16.	Q_D	80,71	mol/g
17.	B_D	$2,14•10^{-2}$	KJ/mol•K
18.	E	4,84	KJ
19.	R^2	0,774	

PVX va chiqindilar asosida olingan, tarkibida azot saqlagan, kuchsiz asos xossasini namoyon qiluvchi ionitga, sun'iy eritmalardan Cu^{2+} ionlarining sorbsiya qonuniyatlari o'rganildi. Sorbsiya jarayonining muvozanati asosida adsorbsiya mexanizmini o'rganish uchun qo'llanilgan turli xil zamonaviy izoterma modellari Lengmyur, Flori-Haggins, Freyndlix, Temkin va Dubinin-Radushkevich modellariga mos keldi R^2(0,774-0,987). Lengmyur izoterma modeli bo'yicha 1 g sorbentning Cu^{2+}ionini yutishining maksimal miqdori aniqlandi va unga ko'ra q_{max}= 109,9 mg/g ga tengligi kelib chiqdi, R_L qiymatining barcha o'rganilgan konsentratsiyalarida 0,01-0,127 ega ekanligi sorbsiya jarayoni qulay bo'lganligidan dalolat beradi. Flori-Haggins izoterma modeli bo'yicha ΔG_{ads}=-20,314 kJ/mol, Freyndlix izoterma modeli bo'yicha n= 2,865 sobrsiya qulay bo'lgan, Temkin izoterma modeli bo'yicha B_T =120,3 J/mol, Dubinin-Radushkevich izoterma modeli bo'yicha B_D=$2,14•10^{-2}$ kJ/mol•K va E_a= 4,84 kJ ekanligi kelib chiqdi. Bu esa yangi ionitga Cu^{2+} ionlarini kimyoviy sorbsiyaga orqali yutilganligini va

bundan polivinilxlorid hamda chiqindilar asosida tarkibida azot saqlagan yangi ionitga Cu^{2+} ionlarining yuqori darajada sorbsiyalashini xulosa qilish mumkin.

Adabiyotlar

1. Davron, B., Mukhtar, M., Nurbek, K., Suyun, X., Murod, J., 2020. Synthesis of a New Granulated Polyampholyte and its Sorption Properties. International Journal of Technology. Volume 11(4), pp. 794-803.
2. Muxamediev M.G., Bekchanov D.J. Novыy anionit na osnove polivinilxlorida i ego primenenie v promыshlennoy vodopodgotovke. Jurnal prikladnoy ximii. 2019. T. 92. Vыp. 11. St. 1401-1407.
3. Qutlimuratov N.M., Tursunmuratov O.X., Bekchanov D.J. 2020-yil, 5-son Polivinilxlorid Plastikati Asosidagi Anionitning Fizik-Kimyoviy Xossalari. ILMIY AXBOROTNOMA/ SAMARQAND.
4. Keno David Kowanga and etc. Kinetic, sorption isotherms, psedo-first-order model and pseudo-second-order model stuies of Cu (II) and Pb(II) using defatted Moringa oleifera seed powder. The Journal of Phytopharmacology 2016;5(2):71-78.
5. Rahman M.S and Islam M.R. Effects of pH on isotherms modeling for Cu (II) ions adsorption using maple wood sawdust. Journal of Chemical Engineering, 2009;149: 273-280.
6. K. M. Elsherif and etc. Adsorption of Co(II) ions from aqueous solution onto tea and coffee powder: equilibrium and kinetic studies. Journal of Fundamental and Applied Sciences 2019, 1 1(1), 65-81.
7. K.Y. Foo and B.H. Hameed. Insights into the modeling of adsorption isotherm systems/ Chemical Engineering Journal156 (2010) 2-10 (journal homepage:www.elsevier.com/locate/cej).
8. Dada, A.O and etc. Langmuir, Freundlich, Temkin and Dubinin-Radushkevich, Isotherms Studies of Equilibrium Sorption of Zn^{2+} Unto Phosphoric Acid Modified Rice Husk/ IOSR Journal of Applied Chemistry (IOSR-JAC) ISSN: 2278-5736. Volume 3, Issue 1(Nov. - Dec. 2012), PP 38-45 www.iosrjournals.org.
9. Ali Kara and Emel Demirbel Kinetic, Isotherm and Thermodynamic Analysis on Adsorption of Cr(VI) Ions from Aqueous Solutions by Synthesis and Characterization of Magnetic-Poly (divinylbenzene-vinylimidazole) Microbeads, Water Air Soil Pollut (2012) 223:2387-2403.
10. T. Ravi and etc. Preparation and characterization of higher degree-acetylated chitosan-coated magnetic adsorbent for the removal of chromium(VI) from its aqueous mixture, J. APPL. POLYM. SCI.2017, APP.45878(1-16).

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EKSTRAKSION FOSFAT KISLOTANI BUG‘LATISh HARORATINING POLIMERLANIShGA TA’SIRI

N.S.Baxriddinov[1], Sh.M.Mamadaliyev[1], T.S.O‘rozov[2], M.N.Tirkasheva[2]
[1]*Namangan muhandislik-qurilish instituti,*
[2]*Samarqand davlat universiteti*

Annotasiya. Maqolada mahalliy fosforit - Markaziy Qizilqum fosforitlaridan olingan ekstraksion fosfat kislotani 55% ga qadar bug’latish asosida olingan konsentrlangan kislotaning tarkibida polifosfatlar hosil bo’lishi, bu kislota tarkibining o‘zgarishi, uning eng asosiy ko‘rsatkichlaridan hisoblangan qo’shimchalardan tozalanishi kimyoviy, fizik-kimyoviy tahlillar asosida bayon etilgan.

Kalit so‘zlar: fosforit, termokonsentrat, ekstraksion fosfat kislota(EFK), konsentrlangan kislota, polifosfat, kimyoviy tahlil, fizik-kimyoviy tahlil, cho‘kma.

Effect of vaporization temperature of extraction phosphoric acid on polymerization

Abstract. The article shows the formation of polyphosphates in concentrated acid obtained by evaporation of up to 55% of extraction phosphoric acid from local phosphorites of the Central Kyzyl Kum, as well as changes in the composition of this acid, its purification from impurities based on chemical, physicochemical analyzes.

Keywords: phosphorite, thermoconcentrate, extraction phosphoric acid, concentrated acid, polyphosphate, chemical analysis, physicochemical analysis, precipitate.