



PHYSICAL CHEMISTRY

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INFRARED SPECTROSCOPIC STUDY OF POROLAS IMPREGNATED SORBENT OF TRANSITION METAL

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Abstract. *Background.* Impregnated sorbents (SIR-solvent impregnated resin) are characterized by organic ligands distributed in the polymer matrix are widely used for extraction, separation and removal of metals from solutions. Sorption of complexing impregnated sorbents is carried mainly by complexing metal ions with functional groups of the sorbents

Purpose. The purpose is to study the infrared absorption spectra of the synthesized novel sorbents before and after metals ions adsorption in order to obtain additional data on structure and mechanism of complexation in impregnated sorbents.

Methodology. The sorbents were prepared by pore volume impregnation method and used in batch sorption experiments (Sintial = 0.1 mol / L, 100 mg sorbent mass, volume 30 ml). As a starting polymeric matrix, styrene-divinylbenzene copolymer beads (Porolas) having a developed porous structure (SBET 900 m² / g) were used. The FTIR spectra of initial polystyrene-divinylbenzene matrix and impregnated sorbents before and after adsorption were compared. The metal concentration was measured by atomic absorption spectrometry.

Originality. For the first time polymer sorbents impregnated by 2-amino-1-methylbenzimidazole, benzhydroxamic acid, dithizone, diethyldithiocarbamate, and FTIR spectra of obtained sorbents was studied in before and after sorption from solution. The participation of the reagent functional groups in complex formation was confirmed. According characteristic bands shift in the spectrum, it was established presence of interaction between an impregnated organic ligand and metal ions to form stable metal complexes.

Findings. Complex formation processes between impregnated sorbents and metal ions on surface were studied by FTIR method. A number of IR characteristic bands in the spectrum showed on metal ions interaction with impregnated organic ligands to form metal complexes.

Keywords: FTIR spectroscopy, sorbent, impregnation, absorption band, metal ions

Highlights:

* The FTIR spectra prove complex formation between metal and impregnant

* SIR were prepared by impregnation of Porolas by MAB, BK, DTZ, DETK

* Sorption of Cu, Zn, Cd, Ni, Mo ions from solutions is conducted

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References

1. Cortina J.L., Miralles N., Aguilar M., Sastre A. Solvent Impregnated Resins Containing Di-(-Ethylhexyl)Phosphonic Acid. I. Preparation and Study of the Retention and Distribution of the Extractant on the Resin//Solvent Extraction and Ion Exchange.-1994.-V. 12.-P.349-369
2. Van Nguyen, N., Lee, J. C., Jeong, J., & Pandey, B. D. Enhancing the adsorption of chromium (VI) from the acidic chloride media using solvent impregnated resin (SIR) //Chemical engineering journal. - 2013. - T. 219. - P. 174-182.
3. Hosseini-Bandegharai, A., Hosseini, M. S., Jalalabadi, Y., Sarwghadi, M., Nedaie, M., Taherian, A., & Eftekhari, A. Removal of Hg (II) from aqueous solutions using a novel impregnated resin containing 1-(2-thiazolylazo)-2-naphthol (TAN) //Chemical engineering journal. - 2011. - T. 168. - N 3. - P. 1163-1173.
4. Hosseini M. S., Hosseini-Bandegharai A. Comparison of sorption behavior of Th (IV) and U (VI) on modified impregnated resin containing quinizarin with that conventional prepared impregnated resin //Journal of hazardous materials. - 2011. - T. 190. - N 1. - P. 755-765.
5. Nishihama S., Kohata K., Yoshizuka K. Separation of lanthanum and cerium using a coated solvent-impregnated resin //Separation and Purification Technology. - 2013. - T. 118. - P. 511-518.
6. Li H. et al. Recovery of indium (III) from a hydrochloric acid medium with two types of solvent impregnated resins containing sec-octylphenoxy acetic acid //Solvent Extraction Research and Development, Japan. - 2014. - T. 21. - N 2. - P. 147-161.
7. Hosseini M. S., Abedi F. Stepwise extraction of Th (IV) and U (VI) ions with mixed-ligands impregnated resin containing 1, 4-diaminoanthraquinone and 1, 4-dihydroxyanthraquinone //Journal of Radioanalytical and Nuclear Chemistry. - 2015. - T. 303. - N 1. - P. 209-216.
8. Ciopec M. et al. Studies Regarding As (V) Adsorption from Underground Water by Fe-XAD8-DEHPA Impregnated Resin. Equilibrium Sorption and Fixed-Bed Column Tests //Molecules. - 2014. - T. 19. - N 10. - C. 16082-16101.
9. Vaughan J. et al. Properties of Lewatit® TP272, a commercial solvent impregnated cation exchange resin for cobalt recovery //Minerals Engineering. - 2016. - T. 88. - P. 2-8.
10. Sharma S., Ghosh S. K., Sharma J. N. Sorption of ruthenium by dipropylmethyl-2-(N, N-diisobutyl) acetamidoammonium iodide impregnated Amberlite XAD-4 resin from nitric acid medium //Separation Science and Technology. - 2016. - T. 51. - N 6. - P. 929-938.
11. Liang L. et al. Separation and recovery of V (IV) from sulfuric acid solutions containing Fe (III) and Al (III) using bis (2-ethylhexyl) phosphoric acid impregnated resin //Chemical Engineering Research and Design. - 2016. - T. 111. - P. 109-116.
12. Adhikari C. R., Sato Y., Tanaka M. Improved Durability of Solvent Impregnated Resin Using Acidic

Organophosphorus Extractant //Resources Processing □□□□□□. – 2014. – T. 61. – N 1. – C. 21-25.

13. Daminova Sh. Sh., Kadirova Z. Ch., Sharipov Kh.T. Nanostruktirovannyh tverdye extragenty na osnove stirola-divinilbenzolnyh matris i N,O,P,S-polifunksionalnyh ligandov // Himiya i himicheskaya tehnologiya. -2016. -N1. -P.45-48.

14. Daminova Sh. Sh., Kadirova Z. Ch., Safarov Y. T., Pardayev O.T., Sharipov Kh. T. IK-spekroskopicheskie issledovanie helatoobrazuyushyih sorbentov na osnove sopolimera stirola i divinilbenzola i ih kompleksov s Ag(I), Cu(II), Ni(II), Fe(III)// Uzbek.himich.jurnal -2013.-N6. -S.6-12.

15. Garnovsky D. A. et al. Direct evidence of coordination on the endocyclic nitrogen atom in the adducts of 2-aminoazoles and 2-aminoazines with copper (II) acetate //Inorganica chimica acta. – 1989. – T. 160. – N 2. – P. 177-182.

16. Holmén B. A., Tejedor-Tejedor M. I., Casey W. H. Hydroxamate complexes in solution and at the goethite-water interface: A cylindrical internal reflection Fourier transform infrared spectroscopy study //Langmuir. – 1997. – T. 13. -N 8. – P. 2197-2206.

17. Salih B. et al. Adsorption of heavy metal ions onto dithizone-anchored poly (EGDMA-HEMA) microbeads //Talanta. – 1998. – T. 46. – N 5. – P. 1205-1213.

18. Li L. et al. Sodium diethyldithiocarbamate as a corrosion inhibitor of cold rolled steel in 0.5 M hydrochloric acid solution //Corrosion Science. – 2012. – T. 59. – P. 249-257.

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M. U. Karimov, A. T. Djalilov, *N. A. Samigov

INVESTIGATION OF PHYSICO-CHEMICAL PROPERTIES OF CEMENT STONE WITH ADDING THE RESULTING SUPERPLASTICIZER BASED ON ACETONEFORMALDEHYDE RESINS

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Abstract. *Background.* Physico-chemical methods of analysis allow identification of individual minerals and determine their quantitative content in the mixture, to explore the mechanism and rate of changes occurring in the material: phase transitions and chemical reactions of dehydration, dissociation, oxidation, reduction with the addition of plasticizers.

Purpose. Research of physical and chemical properties of the cement paste with the addition of obtained superplasticizer based on acetoneformaldehyde resins.

Methodology. Structure formation process of composition is investigated by means of infrared spectroscopy and differential thermal analysis.

Originality. For the first time the process of structure-formation of cement stone with the addition of superplasticizer based on acetone formaldehyde resins has been investigated

Findings. In samples with superplasticizer deeper cement hydration of silicate phases occurs as exemplified by the endothermic effect at 160-170 ° C. Second endo effect with a maximum at a

temperature of 480-490 ° C is caused by dehydration of calcium hydroxide and calcium hydrosilicates. With increasing hydration duration of an increase in weight loss in the TG curve the temperature range 650-780 °C. The third endo effect is caused by decomposition of calcium carbonate and decomposition of calcium silicate (CSH) at a temperature of 670-690 °C.

Keywords: differential thermal analysis, thermogravimetry, endo- and exoeffects, IR spectroscopy.

Highlights.

* Cement stone with plasticizer was obtained;

* Cement's structure-formation process is investigated.

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References

1. Khayat K.H., Hwang S.D. Effect of High-Range Water-Reducing Admixture Type on Performance of Self-Consolidating Concrete// *ACI-Special Publication 239*, 2006, pp. 185-199.
2. Koizumi K., Umemura Y., Tsuyiiki N. Effects of Chemical Admixtures on the Silicate Structure of Hydrated Portland Cement// *Proceedings of the 12th International Congress on the Chemistry of Cement*. - Montreal, 2007. P. 64-71.
3. Koizumi, K. Effects of Chemical Admixtures on the Silicate Structure of Hydrated Portland Cement // *Proceedings of the 12th International Congress on the Chemistry of Cement*. - Montreal, 2007.P. 64-71.
4. Haehnel C., Lombois-Burger H., Guillot at alias L. Interaction Between Cements and Super plasticizers// *Proceedings of the 12th International Congress on the Chemistry of Cement*. - Montreal, 2007. - P. 111-125.
5. Chen Y.L., You W.L. The Composite Effect of Mineral Additives to the Performances of Concrete// *Proceedings of the 12th International Congress on the Chemistry of Cement*. - Montreal, 2007. - P. 289-301.
6. Gamaliy E.A. Kompleksnye modifikatory na osnove efirov polikarboksilatov b aktivnyh mineralnyh dobavok dlya tyazhologo konstruksionnogo betona: dis. ... kand. teh. nauk: 05.23.05 / Gamaliy E.A.- Chelyabinsk, 2009. -217 s.
7. Savitskaya T.A. Vliyaniye vodorastvorimyyh polimerov na ustoychivost I reologicheskiye svoystva suspenziy voloknistogo aktivirovannogo uglya// *Kolloidnyy zhurnal*. - 2006. - T. 68. -N 1. - S. 93 - 99.
8. Rahimbaev Sh.M. Reologicheskiye svoystva penotsementnyh system s dobavkoy anionnogo penoobrazovatelya // *Vestn., dokl.: nauch. - teoret. zhurn.*- 2003.-Ch.4.-S.6-14.
9. Pustovgar A.P. Effektivnost primeneniya sovremennyh superplastifikatorov v suhih stroitelnyh smesyah // 4-ya Mezhlunarodnaya nauchno-tehnicheskaya konferentsiya «MixBULD». 2002. - S.123-126.
10. Karimov M. U., Vafaev O.Sh., Djalilov A. T. Study of the IR spectra obtained superplasticizer and its influence on the physico-chemical and physico-mechanical properties of the cement compositions// *Journal "European applied science"* -Germany. -N8. -2015. -p.77-81
11. Karimov M.U., Djalilov A.T., Samigov N.A., Nurkulov F.N., Zokirov J. Synthesis and application of plasticizing additives for cement//*"Modern Problems of Polymer Science"* Programm and abstract book of 9th Saint - Petersburg Young Scientists Conference, November 11-14, 2013, Saint -

Petersburg, p. 41

12. Karimov M.U., Djalilov A.T., Samigov N.A. Zokirov J.S. A study of the synthesis of hyperplasticizer and its influence on the properties of cement systems// "Modern Problems of Polymer Science" Programm and abstract book of 11th Saint – Petersburg Young Scientists Conference, November 9-12, 2015, Saint – Petersburg

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VOLUMETRIC DRAWING Na^+ , K^+ , $1/2\text{Ca}^{2+}$ // $1/2\text{SO}_4^{2-}$, Cl^- - H_2O IN SYSTEM AT 25°C

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Abstract. Background. The sodium, magnesium, potassium and calcium chloride and sulfate compounds are the main components of salt deposits. They do present there in a form of various minerals, including simple and complex salts, anhydrous and crystalline hydrates in solid sediments. Among them especially the following minerals are extended: halite - NaCl , mirabilite - $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, tenardite- Na_2SO_4 , epsomite - $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, warthite - $\text{Na}_2\text{SO}_4 \cdot \text{MgSO}_4 \cdot 4\text{H}_2\text{O}$; sylvite KCl , carnallite - $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$, kainite - $\text{KCl} \cdot \text{MgSO}_4 \cdot 3\text{H}_2\text{O}$, bischofite - $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ Moreover, bromine salts, boron, carbonates present there in many deposits as well

Purpose. The aim of the study is the mutual solubility of the system of Na^+ , K^+ $1/2\text{Ca}^{2+}$ // $1/2\text{SO}_4^{2-}$, Cl^- - H_2O , to determine the characteristics of equilibrium state and processing of salt deposits of marine type.

Methodology. The study of phase equilibrium was performed by isothermal solubility method at 25 °C temperature. After equilibration the samples of liquid and solid phases were selected to analyze and determine the place of the system's figurative point. Samples were analyzed for calcium - by complexometric method, sodium - by flame photometry; chlorine - by Mohr method.

Originality. A theoretical proof of the interaction of sodium, potassium and calcium chloride and sulfate in the five-component reciprocal system of 2Na^+ , 2K^+ , Ca^{2+} || SO_4^{2-} , 2Cl^- - H_2O at 25 °C was achieved. For the first time there has been built the volumetric diagram of phase equilibrium 2Na^+ , 2K^+ , Ca^{2+} || SO_4^{2-} , 2Cl^- - H_2O at 25 °C based on the findings of theoretical and experimental studies. There have been determined the regularities of salts crystallization and the formation of invariant, mono- and divariational nodal points.

Findings. There have been defined the touch borders of the crystallization areas of salts and established five of invariant P_n , sixteen of of mono-variational s_{nx} and twenty - of divariational S_{ph} nodal points based on the findings of theoretical and experimental studies.

Keywords: diagram, component, liquid and solid phase, equilibrium, arcanite, sylvite, isotherm, system, nodal point.

Highlights.

* New data on heterogeneous phase equilibria in a complex system at 25°C are obtained;

* Volumetric drawing isothermal solubility diagram of the system has been built.

Citation: B.H.Kucharov, B.S.Zakirov, ¹A.U.Erkaev, ¹G.R.Madaliev. Volumetric drawing Na⁺, K⁺, 1/2Ca²⁺ // 1/2SO₄²⁻, Cl⁻ - H₂O in system at 25°C // Uzbek chemical journal, -2016. -Nr6. -P.16-21.

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References

1. Ksenzenko V.I., Kononova G.N. Teoreticheskie osnovy processov pererabotki gallurgicheskogo syr'ya. -M.: Himiya, 1982.- 328 s.
2. Danilov V.P. Issledovanie Kurnakovskoy nauchnoy shkoly v oblasti himii i tehnologii prirodnykh soley. Zhurnal neorganicheskoy himii. 2010 g. Vyip.: 11, Tom 55. S.1794-1802.
3. Anosov V.YA., Ozerova M.I., Fialkov YU.YA. Osnovy fiziko-himicheskogo analiza.-M.: Nauka, 1976.
4. Zdanovskiy A.B. Gallurgiya. M. -L: Himiya, 1976.
5. YEksperimental`nyye dannyye po rastvorimosti mnogokomponentnykh vodno-solevykh sistem: Spravochnik. - SPb.: Himizdat, 2004, t.2, kn. 1-2, -1247 s.
6. Zdanovskiy A.B. i dr. Spravochnik po rastvorimosti mnogo-komponentnykh vodno-solevykh sistem. Tom 2. CHetyrehkomponentnyye i bolee slozhnyye sistemy. Leningrad: - 1954. - 1273 s.
7. Kogan V.B., Ogorodnikov S.K., Kafarov V.V. Spravochnik po rastvorimosti. Tom 3. Kniga tret`ya. Leningrad: - 1970. - 1221 s.
8. A.G. Bergman, N.P. Luzhnaya. Fiziko-himicheskie osnovy izucheniya i ispol`zovaniya solyanykh mestorozhdeniy hlorid-sul`fatnogo tipa. -M.: Izd. An SSSR.-1951. 228 s.
9. Soliev L. Fazovyye ravnovesiya v sisteme Na, K, Mg, Ca // SO₄, Cl-H₂O v oblasti kristallizatsii kainita pri 25°S. Zhurnal neorganicheskoy himii. 1992 g. Vyip.: 9, Tom 37. S.2106-2110.
10. Petrenko S.V., Valyashko V.M., Cigenbalg G. Sistema Na, K, Mg // Cl, SO₄ -H₂O pri temperaturah 140°S. Zhurnal neorganicheskoy himii. 1992 g. Vyip.: 9, Tom 37. S.2111-2119.
11. Goroshenko YA.G. Masscentricheskyy metod izobrazheniya mnogokomponentnykh sistem. - Kiev: Naukova dumka, 1982.- 264 s.
12. Soliev L. Prognozirovaniye fazovykh ravnovesiy v mnogokomponentnoy sisteme morskogo tipa metodom translyatsii (kn. 2). - Dushanbe: SHuhoiyon, 2011. -147 s.

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O.A. Badalova, S.S. Ortikova, SH.S. Namazov, A.R. Seytnazarov, B.M. Beglov

NPSCA-FERTILIZER BASED ON INTERREACTION OF OFF-BALANCE PHOSPHORITE ORE OF

CENTRAL KYZYLKUM IN PARTIALLY AMMONIZED MIX OF PHOSPHORIC AND SULFURIC ACIDS

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Abstract. *Background.* At present, at yzylkum phosphorite combine the large quantity (134.77 thousand ton of P_2O_5 or 42% of initial P_2O_5 in the rock) of phosphorite waste from thermic beneficiation process during the 716 thousand tons of washed and dried phosphorite concentrate production appears. Most of them (9.6%) occur at dried grading, 28.3% at washing, and 4.1% at dry and calcining. These are mineralized mass (12-14% P_2O_5), slime phosphorite ((10-12% P_2O_5) and dust-like fraction (18-20% P_2O_5), respectively. They can be used as reserve to increase phosphate fertilizers amount.

Purpose. To investigate NPSCa-containing fertilizer production by activation of mineralized mass (MM) in ammonized mix of phosphoric and sulfuric acids.

Methodology. An activation of MM with ammonized mix of phosphoric and sulfuric acid were carried out at 60oC for 30 minutes in a range of the acid mix, pH 2.0-3.5, ratio of $SO_3 : P_2O_5$ differs from 1.2 to 2.6 and ratio of ammonium sulphate-phosphate slurry (ASPS) to (MM) differs from 100 : 10 to 100 : 60. All forms of P_2O_5 were determined by photocalorimetric method, CaO - by complexometric techniques. Based on content of CO_2 in the fertilizer it is estimated the decarbonization degree of the phosphate raw. The strength of the granule was measured according to State standard 21560.2-82.

Originality. The data of physical-chemical and physical-mechanical properties of the phosphate raw were achieved. The optimal conditions of the ore activation by ammonized mix of phosphoric and sulfuric acid have been found out. NPSCa containing fertilizer with high total, acceptable and water soluble P_2O_5 content has been obtained possessing sufficient strength.

Findings. It has been shown that activation of MM takes place, that means transfer of unacceptable P_2O_5 containing form into the MM acceptable form under the processing of ammonized mix of phosphoric and sulfuric acid. Amount growth in the mix of sulfuric acid intensifies considerably the phosphate raw activation. Increasing amount of MM in towards to ASPS contrariwise leads to decrease of this value. The optimal ratios of ASPS: MM differ from 100:10 to 100:40 at mix of the acid to SO_3 : $P_2O_5 = 1.2$ for activation of the phosphate raw. In case of $SO_3 : P_2O_5 = 1.65$ the range is the following: from 100 : 10 to 100 : 30. The result of obtained products have ascertained advantages as compared with other phosphoric fertilizers as P_2O_5 wat. : P_2O_5 acc. is 0.4-0.7 that allows to assimilate regularly nutrients through plant.

Keywords: mineralized mass, mix of phosphoric and sulfuric acids, ammonization, activated complex fertilizer.

Highlights

- * Novel kind of nitrogen-phosphorus-sulfur-calcium containing fertilizer is designed;
- * The way of its production is based on activation of phosphorite mineralized waste.

Citation: O.A. Badalova, S.S. Ortikova, SH.S. Namazov, A.R. Seytnazarov, B.M. Beglov. NPSCA-fertilizer based on interreaction of off-balance phosphorite ore of central kyzylkum in partially ammonized mix of phosphoric and sulfuric acids // *Uzbek chemical journal*, -2016. -Nr6. -P.22-32.

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References

1. Kurbanov E., Kuziyev R. Sovremennoye sostoyaniye plodorodiya pochv Uzbekistana i nekotorye puti yego uluchsheniya // Gorniy Vestnik Uzbekistana. - Navoi, 2001. - N1. - S. 94-96.
2. Sadykov B.B., Volynskova N.V., Namazov Sh.S., Beglov B.M. Proizvodstvo ammoniy sulfatfosfata iz fosforitov Tsentral'nyh Kyzykumov // Himicheskaya promyshlennost'. - Sankt-Peterburg, 2007. - t. 84. - N 3. - S. 122-126.
3. Sadykov B.B., Volynskova N.V., Sattarov T., Namazov Sh.S., Beglov B.M. Plotnost i vyazkost smesey ekstraktsionnoy fosfornoj i sernoy kislot // Himicheskaya tehnologiya. Kontrol i upravleniye. - Tashkent, 2007. - N 5. - S. 9-12.
4. Sadykov B.B., Volynskova N.V., Sattarov T., Namazov Sh.S., Beglov B.M. Sostav, rejim polucheniya i tovarnye svoystva ammoniy sulfatfosfata // Himicheskaya tehnologiya. Kontrol i upravleniye. - Tashkent, 2008 - N1. - S. 5-10.
5. Seytnazarov A.R., Turdaliyev U.M., Namazov Sh.S., Beglov B.M. Azotnofosfornye udobreniya na osnove vzaimodeystviya ryadovoy fosforitovoy muki Tsentral'nyh Kyzykumov s chastichno ammonizirovannymi smesyami fosfornoj i sernoy kislot // Uzbekskiy himicheskij jurnal. - Tashkent, 2011. - N2. - S. 35-43.
6. Pozin M.E., Kopyle'v B.A., Tumarkina Ye.S., Belchenko G.V. Rukovodstvo k prakticheskim zanyatiyam po texnologiy neorganicheskix veshestv. - L.: Goshimizdat, 1963. - 376 s.
Pestov N.E. Fiziko-himicheskiye svoystva zernistykh i poroshkoobraznykh himicheskix produktov. - M.: AN SSSR, 1947. - 239 s.
8. Rukovodstvo k prakticheskim zanyatiyam po texnologiy neorganicheskix veshestv / M.E. Pozin., B.A. Kopyle'v., Ye.S. Tumarkina, G.V. Belchenko - L.: Goshimizdat, 1963. - 376 s.
9. Vinnik M.M., Erbanova L.N., Zaytsev P.M. i dr. Metody analiza fosfatnogo syr'ya, fosfornyx i kompleksnykh udobreniy, kormovykh fosfatov. M.: Himiya, 1975. - 218 s.
10. GOST 21560.2-82. Udobreniya mineralnye. Metody ispytaniy. - M.: Gosstandart, 1982. - 30 s.
11. Pryanishnikov D.N. Agrohimiya. Izbrannye sochineniya. Tom 1. - M.: Selhozgiz, 1952. - 692 s.
12. Kopeykina A.N. Znachenkiye vtorichnykh elementov pitaniya dlya selskohozyaystvennykh kultur // Himicheskaya promyshlennost' za rubejom - M.: NIITEHIM. 1984. - N1. - S. 26-44.
13. Magnitskiy K.P. Kalsiyevoye pitaniye rasteniy // Agrohimiya. - 1969. - N12. - S. 129 - 140.

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A.X.Narxodjaev, S. X.Azimov, B. X.Kucharov, B. S.Zakirov, A. A.Orazboeva, A. G. Pogosyan

SYNTHESIS OF LIQUID COMPLEX SUPPLIES FOR PLANT PROTECTION BASED ON COPPER MONOCHLORIDE AND ACETIC ACID

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Abstract. *Background.* To date, for agriculture the preparations in implementation of the integrated action are necessary playing an important role in etching of cereal seeds. Therefore, the creation of domestic drugs possessing fungicidal and stimulating properties based on local raw materials, in our opinion, is important.

Purpose. To determine the physicochemical properties of liquid complexes, to study model solutions corresponding to the composition of the catalyst solution and synthesized biological based on food acid and acetic catalyst solution.

Methodology. We studied the salt composition of the liquid phases in our indicated systems. We used chemical methods, X-ray diffraction, thermal analysis for identification of salt composition forming a liquid phase in the complex preparations.

Originality. New complex preparation that meets the salt composition [40% CH₃COOH + 60% (1% CuCl + 2% HCl + 97% H₂O)] was synthesized which appears as a complex between acetic acid and salt composition of the catalyst solution.

Findings. By studying the interaction in the systems developed on the basis of copper (I) chloride, hydrochloric acid, acetic acid and water, the mutual solubility between the system components was revealed and the configuration of copper monochloride in aqueous and acidic media was defined. The configurational chemical structure of copper monochloride in acetic acid was characterized depending on the acid's content. Complex compound according to the weight ratio (1: 1.5) between the catalyst and the acetic acid solution was tested for fungicidal and stimulating activities.

Keywords: copper monochloride (I), acetic acid catalyst solution, thermal analysis, a fungicide, stimulant.

Highlights:

* The composition of the catalyst solution of acetic acid was found out.

* The synthesized drug was tested for biological activity.

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References.

1. Kefeli V.I., Tureckaya R.H. Rost rasteniy i prirodnyie regulyatoryi M.: Nauka, 1977
2. Kulaeva O.N. Kak reguliruyutsya zhizn` rasteniy // Sorosovskiy Obrazovatel`nyiy Zhurnal, -N1, 1995, S. 20-27
3. Alimuhamedov S.N., Adashkevich B.P. i dr. Biologicheskaya zas`hita hlopchatnika. -Tashkent: Mehnat: -1989. -167 s.
4. Kovalenkov V.G., Narzikulov M.N., Umarov SH.A. Integrirovannaya zas`hita hlopchatnika ot pautinnogo kles`ha // Integr. zas`hita hlopchatnika ot vreditel'ey i bolezney / NIIZR. -Tashkent: VASHNIL. -1971. -Vyip.9. -S.168-178.
5. Hodzhaev SH.T. Integrirovannyye sistemyi zas`hityi rasteniy: uspehi i zadachi // Uzb. Biologicheskii zhurnal. -2012. -N5. -S. 36-38.
6. Golyishin N.M. Fungicidy v sel`skom hozyaystve // M.: Kolos. - 1970. - 82s.
7. Mel`nikov N.N., Novozhikov K.V., Belan S.G. Spravochnik po pesticidam. - M.: Himiya. - 1974. -768s.
8. Kagan YU.S. Obs`haya toksikologiya pesticidov // Kiev. Zdorov`ya. - 1981. - 176s.
9. Polyakov N.M. Himicheskii metod zas`hityi rasteniy ot bolezney // L.: Kolos. S. -1971. -165s.

10. Narhodzhaev A.H., Zakirov B. S., Isomidinov I.T., Kucharov B.H. "Razrabotka sposoba polucheniya kompleksnykh preparatov iz odnohloristoy medi v med`soedyneniya`kh stochnykh vodah i uksusnoy kisloty" Materialy nauchno - tehnikeskoy konferencii "Perspektivy nauki i proizvodstva himicheskoy tehnologii v Uzbekistane" 23-24 maya 2014 g . Navoi, -S.43.

11. Mirkin L.N. Rentgenostrukturnyy analiz: Inditsirovaniye rentgenogramm : L. N. Mirkin. Spravochnoe rukovodstvo/- M : Nauka, 1981 - S. 495.

12. Pishenova L.N. Termografiya: Metod ukazaniya po discipline "Fiziko - himicheskie metody issledovaniya" - Tomsk: Izd-vo Tomsk. Arhimstrant. Uneta, 2005.-S.19.

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A. T. Dadakhodjaev, B. B. Sadiqov, U. H. Boboev, R. D. Isaev, I. S. Mamasoliev

PREPARATION OF ALUMINUM SULPHATE FROM ENRICHED ANGREN KAOLIN

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Abstract. *Background.* Currently, the Republic of Uzbekistan purchases abroad coagulating agents, including aluminum sulfate, aluminum hydroxychloride, chlorine tablets etc. The need for a coagulant is more than 100 thousand tones per year. From Angren kaolin an effective coagulating agent - aluminum sulfate can be obtained. It is applied for water treatment, textile, leather, paper and other industries.

Purpose - the organization of the production of aluminum sulphate from Angren kaolin for water treatment of sewage.

Methodology. The kaolin heat treatment method is applied, followed by decomposition of kaolin with sulfuric acid.

Originality. The dependence of the degree of opening of kaolin from the pre-heat treatment is revealed. The thermal treatment of kaolin at 350 ° C allows to transfer into a solution of about 60% Al₂O₃. Neutralization of the excess acidity with ammonia leads to the formation of impurities in the product ammonia potash alum. Heat treatment at 550 °C allows to transfer into a liquid up to 60 % of Al₂O₃. Calcination of kaolin at 800 ° C rapidly improves the opening of Al₂O₃. Calcination of kaolin at 800 ° C rapidly improves the opening of Al₂O₃. Decomposition at 800 ° C of calcined kaolin with sulfuric acid at a rate lower than the stoichiometric values as well as by drying leads to new coagulant solution appearance containing 15% Al₂O₃. The improvement of filtering of suspensions by coagulant is achieved with the addition of a flocculant - 0.004% of aqueous solution of polyacrylamide.

Findings. It is shown that an enriched kaolin of the Angren deposit is possible to be produced as coagulant Al₂O₃•18H₂O. The product may be treated or untreated. The technology of production is designed with revealing of the technological parameters of the process, allowing to receive appropriate quality product. The yield of the final product is 86-91% in compare with 100 % of the theoretical value. A flow diagram of a pilot plant is designed.

Keywords: aluminum sulfate, enriched kaolin, water treatment, sewage.

Highlights:

- * An enriched Angren kaolin is a good raw material for coagulant production;
- * The product may be treated or untreated.
- * The technology of its production is designed
- * The yield of the final product is 86-91% in compare with 100% theory;
- * A flow diagram of a pilot plant is designed.

Citation: A. T. Dadakhodjaev, B. B. Sadiqov, U. H. Boboev, R. D. Isaev, I. S. Mamasoliev. *Preparation of aluminum sulphate from enriched angren kaolin // Uzbek chemical journal, -2016. -Nr6. -P.38-43*

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References

1. N.P. Lyakis`hev, B.G. Balmaev, L.M. Surova i dr. - Patent RU 2402487 "Sposob polucheniya sul`fata alyuminiya iz obozhzhennyih kaolinovyih glin" - opublikovan 27.10.2010g.
2. A.A. Palang, V.A. Bryukvin, S.V. Palant - Patent RU 2392228 "Sposob polucheniya alyumosoderzhas`hego koagulyanta MPK COIF 7/74" -opublikovan 20.06.2010g.
- 3 P.G. Kudryavcev, A.N. Nedugov, V.A. Ryabov i dr. - Patent RU 2388693 MPK COIB 33/26 - "Sposob polucheniya alyumokremnievogo flokulyanta-koagulyanta i sposob ochistki ego s pomos`h`yu vodyi" opublikovan 10.05.2010 g.
4. SH.K. Umarov, U.SH. Umarov, S.A. Merzlyukova, G.V. Zub - Patent RU 2355639 "Sposob polucheniya sul`fata alyuminiya". Opubl. 20.05.2009g.
5. V.N. Zaharevskiy, P.P. Imangulov - Patent RU 2315715 "Sposob polucheniya sul`fata alyuminiya. Opubl. 27.01.2008g.
6. G.N. Alekseev, N.L. SHipkova, V.V. Borodencova, A.I. Strelkov. L.I. Tonkov. P.V. Ryabinin - Patent RU 2291108 "Sposob polucheniya sul`fata alyuminiya modifitsirovannogo". Opubl. 10.01.2007g.
7. K. Gafurov, A. Ismatov, I. SHamshiddinov, U.K Gafurov, H. Tagaev - Patent RUz ¹ 2562. Byul. N 2. 30.06.95. "Sposob pererabotki kaolina na sul`fat alyuminiya".
8. K. Gafurov, I. SHamshiddinov, U.K Gafurov, - Patent RUz ¹ 4692. Byul. N 4. 30.12.97. "Sposob pererabotki kaolina na sul`fat alyuminiya".
9. K. Gafurov, I. SHamshiddinov, U.K. Gafurov, - Patent RUz, Byul. N 8. 29.08.2008. "Sposob pererabotki kaolina na sul`fat alyuminiya".
10. A. K, Zapol`skiy, A.A. Baran "Koagulyanty i flokulyanty v processah ochistki vodyi", L., Himiya, 1987, str. 208.
11. M. Sitneva "Obzor ryinka kaolina v SNG", Informayn, M., 2006.
12. M.E. Pozin "Tehnologiya mineral`nyih soley", L., Himiya, 1970 , ch.

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F. I. Erkabaev, H. L. Usmanov

CHROMIUM-CONTAINING WASTE - RAW MATERIAL FOR OBTAINING COLORED GLAZE

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Abstract. *Background.* Colored glaze jamming, currently used contain a significant amount of expensive imported components. The same glazes include titanium jamming glazes for tiles with high silencing power, brilliance, micro-hardness, thermal and chemical resistance.

At the electroplating industry of chromium coatings in electrolyte applied containing an oxide of chromium (VI), the iron ions are accumulated, which leads to electrolyte's unfitness. Regeneration, purification of waste solutions yet not gives significant results, and they are currently derived from the system as waste material, toxic, due to hexavalent chromium presence.

Purpose. to develop a new composition of colored opacified glazes for ceramic tiles based on chromium oxide (III), obtained from the spent solution of chromium-containing galvanic chrome-plating shops, as well as to establish its influence on the properties of titanium-containing and jamming glaze coating.

Methodology. The object of investigation is pigment chrome ("chrome green") obtained by precipitation and filtration of the spent solution of galvanic chrome-plating shop.

Originality. It is found that the developed glaze compositions with the chromium pigment obtained from the spent chromium-containing solution, titanium dioxide with silicate compounds of divalent metals gives a high degree of damping and is a full substitute for zirconium.

Findings. The research made it possible to develop a technology for the production of paint materials from waste solutions of chromium-containing galvanic chrome-plating shops, which can be used as fillers and pigments to produce colored glazes.

Keywords: glance, microhardness, electrolyte, waste solution, pigment medium frit, burning, stability.

Highlights:

- * The new composition of the colored glazes based on chromium oxide (III) is developed.
- * The new composition has improved physical and technical properties.
- * The positive results are obtained when tested for chemical stability.

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References

1. Tuymetov B.SH., Irkahodjaeva A. P. Reaksiya obrazovaniya dvustronsievogo titanodisilikata. - Uzb.him.jurn. - 1990. - N1. - 5 s.
2. Tuymetov B.SH., Irkahodjaeva A. P. Sintez i isledovaniya dvubarievogo titanodisilikata. - Uzb.him.jurn. - 1989. - N1. - 66 s.
3. M.YU.Gulyamov, A.P.Irkahodjaeva. Fizika-himicheskiye svoystva legkoplavkikh glazurey, zaglushennyih diopsidom. - Uzb.him.jurn. - 1997. -N2. - S. 3-4
4. Sirajiddinov N.A., Irkahodjaeva A.P. Glushennyie titansoderjashie glazuri. Tashkent: FAN. - 1988 g. - 126 s.
5. G'afarova D.K., Irkahodjaeva A.P., Sirajiddinov N.A. Poluchenie i nekotorie svoystva glushennyih titansoderjashih svetnih glazurey. -Uzb.him.jurn. - 1985. - N3. - S. 66-70.
6. Cherkez M.B., Bogorad L.YA. Hromirovanie. L.: Mashinostroenie 1978. - 100 s.
7. Ishanbabaeva S., To'xtaev S.A., Saidvakkasova S.A. Pererabotka hromsoderjashih otrabotannyih rastvorov // Tez.dokl.nauchno-prakticheskoy konferencii "Problema sozdaniya besstochnih sistem vodosnabjeniya promyshlennyih predpriyatij i ekologii Sredney Azii". Tashkent. - 1991. - 46 s.
8. Erkabaev F.I., Ishanhodjaev S., Babaeva S.A., Hasanov B.H. Otrabotannie hromovyye elektrolityi - siryo dlya polucheniya pigmenta pri elektrohimicheskoy ochistke stochnih vod // O'zbekistonda kimyo ta'limi, fani va tehnologiyasi respublika ilmiy-amaliy konferensiyasi. 28-29 noyabr` 2002 y. Toshkent. - S. 242-243.
9. Ishanhodjaev S., Hasanov B., Ishanhodjaev S.S. Pigmenti na osnove otrabotannyih rastvorov hroma. // Nauchno-tehnicheskaya konferenciya "Novie neorganicheskie materialyi". TashHTI. g.Tashkent 1-3 dekabrya 2000 g. - C. 139-140.
10. Ishanhodjaev S. Erkabaev F.I., Hasanov B., Ishanhodjaev S.S. Razrabotka tehnologii polucheniya oksida hroma(III) iz otrabotannyih hromsoderjashih rastvorov galvanicheskikh sexov. - Uzb.him.jurn. 2001 g. - N3. - S. 33-35.
11. Ishanhodjaev S. Erkabaev F.I. Antikorrozionnie lakokrasochnoe pokryitie na osnove oksida hroma(III), poluchennogo iz otrabotannyih elektrolitov. - Uzb.him.jurn. - 2004 g. - N1. - S. 54-57.
12. Tairova M.H., Irkahodjaeva A.P. Fiziko-himicheskie svoystva stroncievo-barievih titanovih glazurnih pokritiy // Uzb.him.jurn. 1983. - N3. - S. 52-54.

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UDK 665./:7: 66-9

O.Y. Ismailov

INSTALLATIO FOR STUDY THE DEPOSIT FORMATION ON INTERNAL SURFACE IN HEAT EXCHANGERS PIPES

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Abstract. *Background.* When moving the hydrocarbon material in heat exchangers, deposits are gradually formed on the internal surfaces of pipes. This leads to deterioration of heat transfer of heat exchangers and generates enhancement of local corrosion of the metal, resulting in its accelerated destruction leading to operational safety threat. To predict the rate of deposits formation on the internal surface of the heat exchanger tubes is very difficult, because it is a little-studied problem.

Purpose. Investigation of formation of deposits on the inner surface of the pipes of heat exchangers during the hydrocarbons' motion.

Methodology. In order to study the formation of deposits inside of the heat exchanger tubes, an experimental setup has been established. In this installation the experiments on formation of deposits of hydrocarbons (oil and condensate) in a horizontal pipe are carried out. Accumulated deposition in tube has been determined by weighing the initial and final mass of the tube.

Originality. The mechanism of reducing the deposit's weight by heating hydrocarbons in the double-tube device has been developed based on changing of hydrodynamic regimes.

Findings. Our experiments on oil heating process in a tubular device showed that, to ensure the normal operation of heat exchangers we need to reasonably choose the speed of the flow of the heated material. It was revealed that at high speeds the flow of raw materials decreases the likelihood of mechanical deposition of suspended particles contained in the composition, on the inner surface of the pipe. At oil's flow in a horizontal pipe the deposition's weight rate, as far as flow velocity rises from 0.21 to 1.48 m/s, is reduced by 1.4 times. At gas condensate motion in this speed range, the weight of deposit is reduced 8.6 times.

Keywords. oil, gas condensate, heat exchanger, corrosion, flow speed, flow resistance.

Highlights.

- * Along with decrease of deposit's mass on interior pipe's surface the heat transfer rises.
- * Energy carrier's overrun reduces and operating age of the heat exchange equipment increases.

Citation: O.Y. Ismailov. *Installatio for study the deposit formation on internal surface in heat exchangers pipes // Uzbek chemical journal, -2016. -Nr6. -P.49-54.*

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References

1. Faramazov S.A. *Oborudovanie neftepererabativayushih zavodov i ego ekspluatasiya.* - M.: Himiya, 1978. - S. 163.
2. Skoblo A.I., Molokanov Yu.K., Vladimirov A.I., Shelkunov V.A. *Prosessi i apparati neftepererabotki i neftehimii: Uchebnik dlya vuzov. 3-e izd., pererab. i dop.* - M.: Nedra, 2000. - 678 s.
3. Ismailov O Yu., Hudayberdiev A.A.. *Izuchenie prosessa nagrevaniya nefti uglevodorodnimi parami v opitnom trubchatom teploobmennike// Mejdunarodniy nauchno-tehnicheskij jurnal "Himicheskaya tehnologiya. Kontrol i upravleniya".* - 2012. - N 5. - S. 23-27.
4. Ismailov O.Yu., Hudayberdiev A.A., Gazieva F.N. *Opređenje vyazkosti uglevodorodnogo sirya// Uzbekskiy himicheskij jurnal -2012. -N3. -S. 25-27.*

5. Zaharova A. A., Bahshieva L. T., Kondaurov B. P. i dr. Prosessi i apparati himicheskoy tehnologii. Pod redaksiyey prof. A. A. Zaharovoy. – M.: Izdatelskiy sentr «Akademiya», 2006. – S. 30-53.
6. Salimov Z.S., Ismailov O.Yu., Radjibaev D.P. Vliyanie rejimov dvijeniya nefti i gazovogo kondensata na koeffisient teplootdachi v dvuhtrubchatom apparate// Uzbekskiy jurnal nefti i gaza, 2014, -N 1. - S.39-42.
7. Kasatkin A.G. Osnovnie prosessi i apparati himicheskoy tehnologii: Uchebnik dlya vuzov. - 8-e izd., pererab. – M.: Himiya, 1971. - C. 42, 297-301.
8. Pavlov K.F., Romankov P.G., Noskov A.A. Primeri i zadachi po kursu prosessov i apparatov himicheskoy tehnologii. Uchebnoe posobie dlya vuzov/ Pod red. P.G. Romankova. - 10-e izd., pererab. i dop.– L.: Himiya, 1987. - S. 149-169, 531.
9. Kolesnikov V.A., Nechayev Yu.G. Teplosilovoe hozyaystvo saharanih zavodov. – M.: Pischevaya promishlennost,1980. – 392 s.
10. Raschoti himiko-tehnologicheskikh prosessov. Pod redaksiyey professora I.P. Muhlenova. – L.: «Himiya», 1982. – S. 44-72.
11. Manovyan A.K. Tehnologiya pervichnoy pererabotki nefti i prirodnoy gaza. Uchebnoe posobie dlya vuzov. 2-e izd. – M.: 2001 -569 s.
12. Kogan V.B. Teoreticheskie osnovi teplovih prosessov himicheskoy tehnologii. – L.: «Himiya», 1977. – S. 184-185.

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ORGANIC CHEMISTRY

UDK 547.945+547.79+548.737

Z.Ch.Abraeva, M.N.Sultankhodzhaev, B.Tashkhodjaev, V.I.Vinogradova

ACYL DERIVATIVES OF ALKALOID LINDEFOLINE AND LINDEFOLINE N-OXIDE

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Abstract. *Background.* A number of biologically active compounds (platyphulline and sarracine) have been found among pyrrolizidine alkaloids and used in medicine. That's why the development of methods for the preparation of new pyrrolizidine derivatives to produce biologically active substances is attracting the researchers' attention.

Purpose. to study the reaction of lindelofine and its N-oxide to acetic and propionic anhydrides, and benzoyl chloride.

Methodology. In this paper we used the following research method: the reaction of acylation. The synthesized material characterized by spectral methods of IR, ¹H NMR and X-rays.

Originality. by X-rays the absolute configuration of the asymmetric centers and the N-oxide group in the lindelfine N-oxide and reliable structure of 3'-O-benzoyloxylindelfine has been proved.

Findings. aliphatic (2,3'-O-diacetoxylindelfine, 2,3'-O-dipropionate lindelfine, 2,3'-O-diacetoxylindelfine N-oxide) and aromatic (3'-O-benzoyloxylindelfine) acyl derivatives of lindelfine alkaloid and its N-oxide.

IR spectra of the obtained compounds have the additional ester carbonyl absorption bands at 1730-1736 cm⁻¹. PMR spectrum contains five aromatic proton signals (7.93 ppm, 2H, d; 7.49 ppm, 1H, t; 7.36 ppm, 2H, t) of mono-substituted benzene ring, and a signal of 3' geminal proton (5.34 ppm, 1H, quartet), with 0.37 ppm offset in a weak field compared to the spectrum of the original lindelfin.

X-ray analysis demonstrated in the spatial structure of lindelfin N-oxide the cis-bounded five-membered rings in pyrrolizidine nucleus and β -oriented N-O bond. Therefore, basing on the configuration of neighboring asymmetric centers it may be concluded that asymmetric center at the nitrogen atom has R-configuration.

Keywords: pyrrolizidine alkaloid lindelfine, lindelfine N-oxide, acetic and propionic anhydrides, benzoyl chloride.

Highlights.

* Acylation of lindelfin by benzoyl chloride make on a secondary hydroxyl group.

* The 3'-O-benzoyloxylindelfin was obtained as crystalline product.

Citation: Z.Ch.Abraeva, M.N.Sultankhodzhaev, B.Tashkhodjaev, V.I.Vinogradova. Acyl derivatives of alkaloid lindelfine and lindelfine N-oxide // *Uzbek chemical journal*, -2016. -Nr6. -P.55-60.

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References

1. Mashkovskiy M.D. Lekarstvennyie sredstva. // Tashkent. Abu Ali Ibn Sino.-1998.-T. 1.-C. 213-214.
2. Labenskiy A. S., Menshikov G.P. Issledovanie alkaloidov Lindelfia anchusoides. // JOH.- 1948.-T 18.-C. 1836-1842.
3. Tsirulnikova L.T., Labenskiy A. S., Utkin L. M. Alkaloidi rasteniya Lindelfia macrostyla // JOH. - 1962.-T.32.C. 2705-2709.
4. Logie C., Grue M., Liddel J. // *Phytochemistry*.- 1994.- Vol.37. -P.43.
5. Roeder E. // *Phytochemistry*. -1990.- Vol.29. -P.11-29.
6. Stoeckli-Evans H. Bulgarsenine (R:R)-(+)-bitartrate // *Acta Crystallogr.*, Sect.B: Struct. Crystallogr. Cryst. Chem. -1980.-Vol.36, -P.3150-3152.
7. Stecko S., Jurczak M., Urbanczyk-Lipkowska Z., Solecka J., Chmielewski M. Structure of (1S,2S,6S,7S,7aS)-2,6,7-Triacetoxyl-1-acetoxymethylhexahydro-pyrrolizine trifluoroacetate// *Carbohydr. Res.*- 2008. -Vol.343. -P.2215-2217.
8. Perez-Castorena A.-L., Arciniegas A., Perez R., Gutierrez H., Toscano R.A., Villasenor J.L., Vivar A.R.de. Iodanthine, a Pyrrolizidine Alkaloid from *Senecio iodanthus* and *Senecio bracteatus* // *J. Nat. Prod.*- 1999. -Vol.62. -P.1039-1040.
9. Sheldrick G.M. // Program for Empirical Absorption Correction of Area Detector Data; University of Goettingen, Goettingen -1996.
10. Sheldrick G. M. A short history of *SHELX* // *Acta Cryst.* -2008. -Vol.A64. -P. 112 -113.

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UDK 678.6.01:541.6

A.B. Juraev

SYNTHESIS AND RESEARCH OF UNSATURATED POLYETHERS ON THE BASE OF ALCOHOLYSIS PRODUCTS OF SECONDARY POLYETHYLENE TEREPHTHALATE

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Abstract. *Background.* Unsaturated polyester resins (UPE) have been applied in many industrial fields thanks to their complex valuable, occasionally irreplaceable properties and they are intensively being applied. Thus predetermining factor of properties of end product of this or that concrete product by manufacture is the structure of UPE. However, it is necessary to note the demand of these resins is satisfied at the expense of import.

Therefore, the research of synthesis condition of UPE on the basis of set properties of alcoholysis products of secondary polyethylene terephthalate is rather actual.

Purpose. Studying synthesis condition (duration of the temperature rise) of unsaturated polyether of alcoholysis products of SPEP, the process of hardening and physical-mechanical properties of UPE on their basis.

Methodology: In the current research, the following methods have been used: acid number according to SS 25210-82 determination; the content of double bonds in UPE definition with the Bromide-bromate method; gelatinization time definition according to SS 22181-91; the static bend definition according to SS 4648-71, as well as impact strength - on SS 14235-69.

Originality: It has been shown that uprising of temperature to start polycondensation reaction raises the share of trans - isomers in UPE, which leads to the change of the speed of hardening and the increase of physical-mechanical properties of UPE on their basis.

Findings. It has been shown that the temperature rise of UPE synthesis upto 210±5°C leads to the growth of concentration of trans - isomers in UPE on the basis of alcoholysis products of secondary polyethylene terephthalate. It has been determined synthesis conditions of unsaturated polyether on the basis of alcoholysis products of SPET.

Physical-mechanical and thermophysical properties of hardened UPE have been investigated. As a result, it has been revealed that the impact strength of developed UPE is at the level of commercial samples, and it surpasses a little them in the field of bending strength and heat stability.

Keywords: secondary polyethylene terephthalate, duration of synthesis, unsaturated polyether, physical-mechanical and thermophysical properties.

Highlights:

- * New UPE synthesis conditions on the alcoholysis products of SPEP are defined;
- * The increase of their strength properties has been detected.

Citation: A.B. Juraev. *Synthesis and research of unsaturated polyethers on the base of alcoholysis*

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References

1. Lebees I.K., Naumes V.N. Korrozionno-stoykie trubi i emkosti iz stekloplastikov: materiali, svoystva, tehnologii. -M.: Enas, 2015. - 448 p.
2. Sedov L.N. Mihaylova Z.V. Nenahsishennie poliefiri. -M.: Himiya. 1977. - 232 p.
3. Reyblan A.I. Zashitnie lakokrasochnie pokritiya. -M.: Himiya, 1982. -520p
4. Boro Chandramika, Bharali Pranjali, Baglari Silpi, Dolui Swapan K., Kanwar Bolin K. Strong and conductiv reduced graphene oxide/polyester resin composite films with improved mechanical strength, thermal stability and its antibacterial activity // Compos. Sci. And Technol. 2013. 87, - P. 1-7.
5. Ray Dipa, Das Keya Ghosh S.N., Bandyopadhyay N.R., Sahoo Saswata, Mohanty Amar K., Misra Manjusri. Novel materials from sesame husks and unsaturated polyester resin // Ind. And Eng. Chem. Res. 2010. 49, N13. - P. 6069-6074.
6. Benig G.V. Nenashishennie poliefiri. Stroenie I svoystva. /per. s ang. pod red. L. H. Sedova. M.:Himiya, 1988. - 256 p.
7. Omelchenco S.I. Slojnie oligoefiri I poliefiri na ih osnove. - Kiev.:Naukova dumka, 1976. - P. 104.
8. Jurayev A.B., Alimuhamedov M.G. Issledovanie strukturirovaniya NPEF na osnove produkta himicheskoy destruktсии PETF / Trudi XIII nauch.-teh. konf. «Fan xaftaligi-2004» professorsko-prepodavatelsrogo sostava aspirantov, doktorantov, nauchnih rabotnikov I studentov THTI, g. Tashkent, 2004. - P. 102-104.
9. Juraev A.B., Nizamov T.A., Adilov R.I., Alimuhamedov M.G., Magrupov F.A. Izucheniye tehnologicheskikh parametrov otverjdeniya nenasishennih poliefirov na osnove vtorichnogo polietilentereftalata / Trudi «Mejdunarodnoy konferensii po himicheskoy tehnologii HT¹ - 07» posvyashennoy 100 letiyu so dnya rojdeniya akad. Javronkova N.M. Moskva, 2007, tom-5, - P. 161-164.
10. N. A. Ilpasheva, G.A. Hlebov, S.V. Fomin. Issledovaniye vliyaniya razlichnih komponentov na tehnologicheskiye svoystva kompozitsii na osnove poliefirnih smol // Plast. massi. 2008, N7. - P. 33-35.
11. Burkev M.J., Magzumova A.K., Burkeev A.V., Iskanova J.B. Sintez I issledovaniye sopolimerov nenasishennoy smoli vinilnimi monomerami // Izv. Vuzov. Himiya i him. tehnologiya. 2012. 55, N7. - P. 60-63. rus. RZH 2012.10-19C.605.
12. A.B. Juraev, T.A. Nizamov, R.I. Adilov, M.G. Alimuhamedov, F.A. Magrupov. PET soderjasheye bitoviye othodi kak istochnik sirya dlya sinteza nenasishennih poliefirov // Plasticheskiye massi», 2011, N4. - P. 55-59.
13. K. Nakanisi. Infrakrasniye spektri I stroeniye organicheskikh soedineniy/ per. s agl. pod red. A.A. Maltseva. - M.: Mir, 1965. - 210 p.

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UDK 665.664.1

M. N. Rahimov, G. H. Sulaymanova, A. T. Oltiyev, K. H. Majidov

THERMOPHYSICAL PROPERTIES OF EMULSION FAT PRODUCTS

Bukhara engineering technological institute of the Republic of Uzbekistan Ministry of Higher Education,

Abstract. *Background.* For the definition of thermophysical properties and research of thermophysical regularity of fatty products in the field of phase transitions, a calorimetry method has received the greatest popularity meeting modern requirements of thermophysical diagnostics of the quantitative analysis, allowing to solve management and control problems of crystallization processes.

Purpose - Determination of thermal properties and research of thermal patterns of fatty products in the field of phase transitions, allowing solving management tasks and control of crystallization processes.

Methodology. For definition of a specific thermal capacity and heat conductivity of fats, oils and fat-containing emulsion in a range of temperatures of phase transitions the standardized calorimeters and specially developed thermophysical stands working in a mode of discrete input of heat and monotonous heating were used, allowing carrying on measurement of a specific thermal capacity and heat conductivity.

Originality. Results of research of a thermal capacity and heat conductivity of fatty raw materials and fat-containing emulsion, and also enthalpy, warmth and degrees of crystallization of fats and oils are systematized.

Findings. Over fat acids, triglycerides, fats and oils at certain stages of their thermal processing the changes of phase conditions accompanied by modular transformations of their consistence in liquid and solid forms were tested. Results of thermophysical researches have allowed establishing accurately enough temperature borders and temperature ranges for phase transitions of fats and oils.

Keywords: Thermal properties, vegetable oils, animal fats and food, specific heat capacity and thermal conductivity.

Highlights:

- * Hydrogenated and interesterified fats possess saturated fatty acids;
- * The temperature characteristics of phase transitions for fats and oils are studied;
- * Phase transitions at their melting and solidification are used.

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References

1. Arutyunyan N.S. i dr. Tehnologiya pererabotki zhirov. - M.: Kolos. 1999. - 368 s.
2. Stopskiy V.S., Klyuchkin V.V., Andreev N.V. Himiya zhirov i produktov pererabotki zhirovogo syir`ya. - M.: Kolos. 1992. - 286s.
3. Grinberg G., S`Hepan`skaya G. Modificirovannyye zhiryi. -M.: Pis`hevaya promyshlennost`, 1973.- 194 s.
4. Recepturyi na margarin, zhiryi konditerskie, hlebopekarnyye i kulinarneye. -Leningrad, VNIIZH, 1987.-40 s.

5. Rukovodstvo po tehnologii polucheniya i pererabotki rastitel`nyih masel i zhirov / Pod red. Sergeeva A.G. i dr. L.: VNIIZH.-t.II, 1973, 350 s., t.III, kn.1, 1983, 288 s.; t.III, kn.2, 1977, 351 s.; t.IV, 1975, 544 s.; t.V, 1981, 296 s.; VI, 1989, 360 s.
6. Rogov B.A., Klyuchkin V.V. Teplofizicheskie svoystva pis`hevogo syr`ya v processah podgotovki i polucheniya margarinovyih yemul`siy. SPb., VNIIZH, 1992. 68 s.
7. Rogov B.A., Klyuchkin V.V., Lyisenko V.F. Teplofizicheskie svoystva zhirovogo syr`ya i yemul`siy margarinovoy produktsii v processah termooborotki. SPb. VNIIZH. 1994. 70 s.
8. Mazhidov K.H. Issledovanie i sovershenstvovanie tehnologii gidrogenizatsii hlopkovogo masla na modifitsirovannyih splavnyih stacionarnyih katalizatorah. / K.H.Mazhidov: Avtoref. diss. dok. tehn. nauk. - L.: 1987, - 48 s.
9. Mazhidova N.K. Povyisheniya kachestva i obespechenie pis`hevoy bezopasnosti salomasov, poluchaemyih gidrogenizatsiey hlopkovogo masla / Avtoref: diss., kand. teh. nauk. -Tashkent: TashKTI, 2010. -26 s.
10. Oltiev A.T. Sovershenstvovanie tehnologii pereyeterifikatsii zhirov s ispol`zovaniem hlopkovogo masla. ZHurnal "Maslozhirovaya promyshlennost`". 2016. N1, 10-12 s.
11. Oltiev A.T. Obespechenie pis`hevoy bezopasnosti zhirov tehnologiey pereyeterifikatsii. ZHurnal "Maslozhirovaya promyshlennost`". 2016. N2, 30-32 s.
12. Sulaymanova G.H. Ispol`zovanie mestnyih i netraditsionnyih syr`evyih istochnikov v tehnologii prigotovleniya yemul`siy. ZHurnal "Maslozhirovaya promyshlennost`". 2016. N1, 38-40 s.
13. Sulaymanova G.H. Sovershenstvovanie tehnologii proizvodstva yemul`girovannyih zhirov. ZHurnal "Maslozhirovaya promyshlennost`". 2016.-N2.-S.34-36.

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UDK 665.5

M.J.Makhmudov, G.R.Narmetova

APPLICATION OF OBTAINED NICKEL CONTAINING CATALYSTS FOR BENZYLIDENEAMINO FRACTION OF GASOLINE AI-80 HYDROISOMERIZATION

Institute of General and Inorganic Chemistry of the Academy of Sciences of Uzbekistan, Tashkent.

Abstract.Background: The number of high-octane gasoline fractions required by market is constantly growing. The constant increase in the consumption of gasoline entails the consideration of options for creating a complete set of processes for the production of high-octane gasoline fractions in refineries.

Purpos. – to provide nickel catalysts and determination of their hydroisomerization properties in the model mix to produce gasoline that meets the European standard-5 requirements to benzene and aromatics by hydroisomerization of benzene-containing fraction method.

Methodology. The research has based on a set of classic and modern methods, allowing to determine the physical and chemical characteristics, functional composition, to study processes occurring in the

initial motor gasoline and gasoline subjected to various processes of gentrification, in particular, dearomatization, as well as to establish the chemical compositions, structure, chemical nature and their stability.

Originality. For the first time the properties of hydroisomerized Ni/Al₂O₃ catalyst in a model mixture of benzene – heptane is investigated and defined for this catalyst the optimal parameters of hydroisomerization process.

Findings. A selective hydroisomerization heptane – benzene proceeds on Ni/Al₂O₃-20 catalyst at a temperature of 300°C and under a pressure of 3 MPa. At this temperature, the yield of liquid products of hydroisomerization is provided at a level close to 100 wt. % and the maximum yield isoheptane and high yield of methylcyclopentane is achieved.

Keywords: petrol, benzene, heptane, catalyst, hydroisomerization, methylcyclopentane, cyclohexane

Highlights:

* Nickel catalysts are got and their nature is defined in the hydroisomerization reaction.

* Hydroisomerization's optimal parameters are defined using Ni/Al₂O₃ catalyst.

Citation: M.J.Makhmudov, G.R.Narmetova. Application of obtained nickel containing catalysts for benzylideneamino fraction of gasoline Al-80 hydroisomerization // Uzbek chemical journal, -2016. -Nr6. -P.74-80.

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References

1. Parshikov V.N. Tovarovedenie i yekspertiza byitovyih himicheskikh tovarov. - M.: Akademiya, 2005. - 224 s.
2. Shepelev A.F., Pechenezhskaya I.A. Tovarovedenie i yekspertiza himicheskikh tovarov i goryuche-smazochnyih materialov. - Rostov-n / D: Feniks, 2002. - 224 s.
3. Talismanov E.L., Trofimova O.V., Smirnov V.K., Irisova K.N. Poluchenie komponentov dizel`nogo topliva s ul`tranizkim sodержaniem seryi v usloviyah otechestvennyih NPZ // Neftepererabotka i neftehimiya. - 2004. - N11. - S. 13-16.
4. Obzor innovacionnyih processov neftepererabotki (po materialam Hydrocarbon Processing. - 2008 - N5.) // Mir nefteproduktov. - 2009. - N1. - S. 42-43.
5. Kudakova A.S. Analiz processov ochistki nefteproduktov // Sb. materialov IV Vserossiyskoy konferencii molodyih uchennyih (19-21 oktyabrya 2009 g., Tomsk, Rossiya). - Tomsk: Izd-vo. Instituta optiki atmosferyi SO RAN, 2009. - S. 531-532.
6. Rasskazchikova T.V., Kapustin V.M., Karpov S.A. YEtanol kak vyisokooktanovaya dobavka k avtomobil`nyim toplivam. HTTM. - 2004. - N4. -S. 3.
7. Onoychenko S.N., Emel`yanov V.E., Aleksandrova E.V. Ispol`zovanie dobavok na osnove izopropanola pri proizvodstve benzinov. HTTM. - 2003. -N 2. - S. 32.
8. Onoychenko S.N., Emel`yanov V.E., Kryilov I.F. Sovremennyye i perspektivnyie avtomobil`nyie benzinyi. HTTM. - 2003. -N¹⁶. - S. 3.

9. Azev V.S., Lebedev S.R., Mitusova T.N., Emel`yanov V.E. Uluchshenie kachestva avtomobil`nyih benzinov. Dostizheniya i perspektivy. HTTM - 1998. - N5. - S. 5.
10. Fedorinov I.A., Abdulminev K.G. High -octane gasolines production technology with the improved ecological properties. // Abstracts of XVI International Conference on Chemical Reactors "Chemreactor-16", - Berlin, 2013. - p. 347-348.
11. Emel`yanov V.E., Simonenko L.S., Skvorcov V.N. Antidetonacionnyie svoystva ferrocena v benzinah razlichnogo komponentnogo sostava. HTTM. - 2010. - N12. - S. 42-46.
12. Znidarcic Li D., Thiel C., Lee C.K. German refiner debottlenecks diesel hydrotreaters // Oil and Gas Journal. - 2012. - V.99, no., 34. - R. 68-71.
13. Boruckiy P.N., Podkletnova N.M. Kataliticheskie processyi izomerizacii i degidrirovaniya uglevodorodov dlya proizvodstva izokomponentov benzinov // Kataliz v promyshlennosti. - 2003. - N2. - C. 86-88.
14. Sinnen H.D. How synergies with the petrochemicals sector // Erdol Erdgas Kohle. -2011. - V.117, no., 10. - P. 461-465.
15. Robert E. C., George W. M., Charles L. M. WSPA study of the cost impacts of potential carb phase 2 gasoline regulations. WSPA contract ¹ DF 201- 06, Phases I, II and III. - 2001. - 235 p.
16. Vyhrestyuk N.I., Lizogub A.P., ZHurba A.S. Hromato-spektroskopicheskoe izuchenie individual`nogo sostava benzinov kataliticheskogo riforminga // Himiya i tehnologiya topliv i masel. - 1973. - N5. - S. 6-8.
17. Polyakova A.A. Molekulyarnyy mass-spektral`nyiy analiz organicheskikh soedineniy. Standartyi ASTM-5134. Hromatograficheskyy analiz komponentnogo sostava benzina. Metodicheskaya rukovodstva SSHA. - M.: Himiya, 1983. - 360 s.
18. Zaykin YU.A., Zaykina R.F. Novyye metodyi radiacionnoy pererabotki nefti // Neft` i gaz. - 2011. - N^o6 (66). - S. 83-90.
19. Ahmedov YE.I. Vliyanie dobavok vyisokokremnezemnogo ceolita tipa pentasila na aktivnost` palladiyceolitnogo katalizatora izomerizacii n-geksana i n-heptana // Neftepererabotka i neftehimiya. - 2000. - N3. - S. 16-18.
20. Narmetova G.R. Kolloidno - himicheskie osnovyi sozdaniya polifaznyih sorbentov dlya gazo - zhidko - tverdogaznoy hromatografii: Avtoref. dis. ... d.h.n. - Tashkent, 1993. - 38 s.

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UDK 678.5

Lee Myong Suk

INNOVATIVE TECHNOLOGY FOR PRODUCING POLYETHYLENE AT UGHK

Institute of General and Inorganic Chemistry of the Academy of Sciences of Uzbekistan, Tashkent.

Abstract. *Background.* Availability of cheap and quality gas chemical raw ethylene will allow

Uzbekistan to produce actual brands of polyethylene of various density on an industrial scale.

Purpose. The aim of the present work is to study special features of polyethylene produced in accordance with the licensed technology of Lotte Chemical Corporation. The task of the present work is determination of the main features of bimodal polyethylene produced in processing under usage of double reactor cascade technology. Production of bimodal polyethylene will help to stimulate development of production with deepened gas processing and output of the products high value added.

Methodology. We used scientific methods of research, including economic and statistical and comparative methods, as well as expert estimations, allowing showing the possibility of further use of this technology in Uzbekistan through the use of regional industry periodicals and corporate data of global petrochemical leader.

Originality. It is the first time when the analysis of new technology of polyethylene production of Lotte Chemical Corporation was made; it allows as a whole to determine and systemize factors which influence on innovation strategy of development of Gas&Chemical complex of Uzbekistan.

Findings. Application of this technology will increase the manufacturability of the resulting polyethylene, while maintaining the desired characteristics of strength, firmness and durability of the material. The advanced licensed technology in Ustyurt Gas & Chemical complex provides for deepening processing of local raw materials, allowing to extract from natural gas up to 97% of ethane, propane and other valuable components.

Keywords: Ethylene polymerization, a bimodal polyethylene, the catalyst system, the molecular weight, high molecular weight, low molecular weight fraction.

Highlights.

- * A joint venture for the deep processing of hydrocarbon raw materials established;
- * Largest gas-chemical complex in Central Asia should be built.

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References

1. Celevaya programma "O prioritetah razvitiya promyshlennosti Uzbekistana v 2011-2015 godah". Istochnik: [review.uz>...v...dolya...vvp-uzbekistana-uvelichitsya...28.](#)
2. A.P.Belokuroia, T.A.Ageeva Himiya i tehnologiya polucheniya poliolefinov. Uchebnoe posobie pod red. O.I.Koifmana. Ivanova, 2011.
3. A.Masanov. Sovremennyye tehnologii proizvodstva i vostrebovannyye v Rossii marki poliyetilena Istochnik: [cerolt.livejournal.com>11043.html](#)
4. G.V.Tarakanov. Osnovyi tehnologii pererabotki prirodnogo gaza i kondensata. Uchebnoe posobie pod red. G.V.Tarakanova, A.K.Manovian; Astrahan, Izd-vo AGTU, 2010.
5. V.V.Lebedev Biomadal`nyie tehnologii polucheniya poliyetilene 3-go pokoleniya (obzor). Istochnik:

repository.kpi.kharkov.ua>

6. V.S.Stankevich, S.M.Eremkin, G.V.Nesin Kataliticheskie sistemyi polimerizacii olefinov na osnove perehodnyih metallov dlya proizvodstva poliyetilena trubnyih marok. // G.Tomsk, ZH.Izvestie Tomskogo politehnicheskogo universiteta, ¹ 3, 2009. Istochnik: ores.su>Prescopus Russia>...-tom-3-5-nomer-3/a135799

7. Licenzirovannyye tehnologii polucheniya bimodal`nogo poliyetilena (shema). Istochnik: studopedia.ru>12_64626_Spherilene...Basell.html

8. Poluchenie bimodal`nogo poliyetilena po processu CX Mitsui. Istochnik: studopedia.ru>12_64626_Spherilene-litsenziar-...

9. Vysokie peredelyi. Uzbekskoe preduprezhdenie Rossiyskoy neftehimii Istochnik: ngv.ru>pdf_files/8663.pdf

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