PHYSICAL CHEMISTRY

UDK УДК 661.183.12

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STUDY OF SORPTION KINETICS AND MECHANISMS OF INTERACTION OF IONS OF COPPER FROM A COPPER-AMMONIA SOLUTIONS ON SYNTHESED AMPHOLYTE

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Abstract. Background. One of the main sources of pollution of soil, water reservoirs, aquifers and agricultural land with heavy metals are chemical production wastewater. If inefficient wastewater treatment heavy metals fall into natural water bodies, soil and through the food supply paths reach the man. Also important is the fact that the annual loss of tens of thousands of tons of heavy metals discharged with the wastewater of industrial enterprises, damage the economy.

Thus, the particular importance has the search for resource-saving technologies for the extraction of metal ions from industrial waste water and their return to production. Therefore, in recent years synthesis and study of the basic physical and chemical, kinetic properties of domestic sorbents on the basis of the available cheap raw materials and also produced using wastes are of great importance.

Purpose. The aim of a research was to establish conditions for the formation of a stationary front of copper (II) ions to be absorbed under static conditions in the H- and Na-form of ANKBF ampholyte containing in its composition aminocarboxylic ionic groups, assessment of limiting stage of ions diffusion, study of kinetic characteristics of the process and the possibility of applying for copper sorption from copper-ammonia solution solutions.

Methodology. In the present study were used the following methods: static exchange capacity was determined according to GOST 20255.1- 89; determination of pH environment was carried out on the pH meter pH-410 AKVILON; determination of copper ions was determined by iodometric method as described in [1].

Originality. There were studied kinetics and mechanism of copper ions sorption from the copper-ammonia solution that was used for cleaning conversion gas at “MAXAM-CHIRCHIQ” JSC on the new aminocarboxylic sorbent “ANKBF” in H- and Na-forms synthesed from furfural and vat residues of nitrile acrylic acid production at JSC "Navoiazot".

Findings. It was revealed that the resulting ANKBF ampholyte has a sufficiently high kinetic rates and could be used in process of copper sorption from copper-ammonia solutions.

Keywords: ampholyte, copper-ammonia solution, diffusion coefficient, half-time, activation energy.

Highlights:
* There were studied the mechanism of copper ions sorption.

* There were established that nature of sorption has internal diffusion mechanism.

* There were found diffusion coefficients, the activation energy of the process of sorption.

**Citation:** N.M. Abdutalipova, S.M. Turobjonov. Study of sorption kinetics and mechanisms of interaction of ions of copper from a copper-ammonia solutions on synthesized ampholyte // Uzbek chemical journal. -2016. -Nr5. -P.3-8.

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**References**


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UDK 541.64.67

F.B. Eshkurbonov

**PROCESSES OF THE COMPLEX FORMATION OF IONS OF NON-FERROUS METALS WITH MULTIFUNCTIONAL ANIONITAMI**

**SUE Tashkentsky research institute of chemical technology, E-mail: furqat-8484@mail.ru [1].**

**Abstract.** **Background.** Wide use of complexons in various field of science and equipment demands knowledge of the main physical and chemical constants of the complexes formed by them, studying of all variety of the factors influencing a complex formation including, and knowledge of constants of dissociation of complexons.

**Purpose.** For the purpose of identification of perspective scopes of the received anionit their sorption ability to ions of some metals depending on the nature and concentration of metal-kompleksoobrazovatelya, pH, the ionic force of solution, chemical structure of anionit is investigated.

**Methodology.** It is shown kompleksoobrazuyushchye properties to methods of electrometric titration, and also IK – spectroscopy.

**Originality.** New multifunctional is synthesized anionit product-based interactions on the basis of thiourea (T), epichlorohydrin (EHG) and a polietilenpollamin (PEPA) form complex connections with cations of some transitional metals.
Findings. In IR spectrums of anionit there is a change of intensity of strips of absorption to areas 2000-1600 and 800-660 of cm\(^{-1}\) (disappearance of a strip of absorption in case of 1650-1380 cm\(^{-1}\), broadening of a strip in case of 1400-1070 cm\(^{-1}\)), the responsible for asymmetric and symmetric fluctuations ionized sulfur-containing groups. In long-wave area there are strips of 870-668 and 970-870 cm\(^{-1}\) that is connected with formation of complex communications of the researched ions with nitrogen and oxygen of functional groups. About formation of complexes anionit – metal is witnessed by data IK – spectroscopy (fig. 1). In all cases in ranges there are characteristic strips (1400 – 1300 cm\(^{-1}\)) of communication of N-Me.

**Keywords.** the complex formation, anionit, IR spectrum, amino groups, constants, copper ions.

**Highlights:**

* We have determined static sorption capacities by ions of Cu\(^{2+}\), Zn\(^{2+}\), Cd\(^{2+}\), Pb\(^{2+}\).

* SSE for Zn\(^{2+}\) -3,8 - 4,1; Cu\(^{2+}\).- 4-4,7; Pb\(^{2+}\) - 3,4-4,3; and Cd\(^{2+}\) - 3,1 - 3,9 mg-ek/g for.

**Citation:** F.B. Eshkurbonov. Processes of the complex formation of ions of non-ferrous metals with multifunctional anionitami // Uzbek chemical journal. -2016. -Nr5. -P.9-13.

**Received:** 08.04.2016; **Accepted:** 21.10.2016; **Published:** 31.10.2016

**References**


8. Ismailov A.I., i dr. Sintez azot-, galogen- i kremniysoderzhashih polimernyh i oligomernyh antiperenov // Uchastie molodyx uchenyh v reshenii problemyx zadach po sovershenstvovaniyu tehniki i tehnologii hlopkoochistitelnoy, tekstilnoy, legkoy i poligraficheskoy promyshlennostey: Tezisy
APPLYING METHOD OF SUPERHIGH FREQUENCY STORAGE PESTS AND IDENTIFY THE OPTIMUM AMOUNT OF POWER, TIME KILL PESTS

Andijan machine-building institute, Andijan, e-mail: 4741601@mail.ru [2]

Abstract. Background. Pests of grains spread widely around the world and they affect different types of grain products during storage. These insects are well adapted to the environmental conditions, and quickly grow. Especially they grow quickly in the moist condition and condition that there not airy. Apart from pests, birds and rodents would be cause to reduce the mass of grain. The main pests of grain stocks are insects that contribute to grain losses of up to 6%. Pests destroy quantity and impair the quality of grain products. Some pests can be dangerous to human health and animals. The activities of pest control of companies for the storage of grain are complex, expensive, and requires a full stop of production. Therefore, method using a microwave (super high frequency) radiation, electrical fields and other physical methods, which do not require production stoppage are considerably interesting.

Purposes. To determine the degree of contamination, the structure of pests of wheat grain mass and the degree of safety of the method with respect to the nutritional value of the grain. Developing an effective method of combating pests of grain. To reduce number of pests that are located in the grain.

Methodology. We used the standard methods of studying the basic parameters of the grain mass stored in silos.

Originality. use physical methods of decontamination the granaries by particular microwave. A method that provides effective pest control while maintaining the germination of seeds. The method can be used to destroy pea weevil in any age over the whole storage period.

Findings. According to the results of experimental studies a method of disinfecting grain mass in storage using microwave radiation has developed, in the most acceptable disinfection conditions, which can be widely used in industrial bread production.
**Keywords:** microwave, pest control, ultra-high frequency, voltage, pests, power, grain, methods, radiation.

**Highlights:**

* The method provides an effective pest control while maintaining the germination of seeds.

* Use agriculture, electromagnetic treatment processes with the aim of grain disinfestations.

**Citation:** D.M. Tuychiyeva, M.A. Raximdjanov. Applying method of superhigh frequency storage pests and identify the optimum amount of power, time kill pests // Uzbek chemical journal. -2016. -Nr5. -P.13-18.

**Received:** 20.09.2016; **Accepted:** 14.10.2016; **Published:** 31.10.2016

**References.**


8. Zerno. Metody opredeleniya zarajennostii povrejdeniya vreditelyami.-ГОСТ.13586.4-13.-9 s.


**INORGANIC CHEMISTRY**
STUDY OF MUTUAL SYSTEM SOLUBILITY OF CA\(^{2+}\), 2NH\(_4^+\)// 2NO\(_3^-\), CO\(_2^-\) - H\(_2\)O AT 30\(^\circ\)C AND 60\(^\circ\)C

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Institute of General and Inorganic Chemistry Uzbek Academy of Science

Abstract. Background. One of practicable ways for using calcium nitrate solution forming during the nitric acid processing low-grade phosphorite from central Kyzylkum is conversion it by ammonium carbonate. The technological scheme developed is based on physico-chemical properties of fourfold mutual aqueous system consisting of calcium nitrate and ammonium carbonate.

Purpose. The aim of research is to study solubility of mutual system of CA\(^{2+}/2\), 2NH\(_4^+//2\)NO\(_3^-\), CO\(_2^-\) - H\(_2\)O to determine behavior of equilibrium and calcium nitrate conversion condition.

Methodology. Investigation of phase equilibrium has been conducted by isothermal solubility at a temperature of 30 and 60\(^\circ\)C. After establishing equilibrium it is performed that sample selection from liquid and solid phases to analyze and define place of system figurative point. The samples were analyzed on CaO content by complexonometrically. N is determined by distilling off the ammonia and titrimetric determination on Kjeldal. CO\(_2\) is determined by rapid volumetric method based on the decomposition of carbonates in hydrochloric acid and determining the amount of evolved carbon dioxide.

Originality. There has been the theoretical foundation of interaction process of calcium nitrate with ammonium carbonate based on solubility diagram study of mutual system of CA\(^{2+}/2\), 2NH\(_4^+//2\)NO\(_3^-\), CO\(_2^-\) - H\(_2\)O at temperature of 30 and 60\(^\circ\)C and determined the optimal condition for calcium nitrate processing.

Findings. Based on the theoretical analyzes and experimental data for the first time there have been built the solubility diagram of CA\(^{2+}/2\), 2NH\(_4^+//2\)NO\(_3^-\), CO\(_2^-\) - H\(_2\)O at of 30 and 60\(^\circ\)C, which allowed to define the optimal condition of calcium nitrate with ammonium carbonate conversion. It has been shown that efficiency of CA\(^+\) and NH\(_4^+\) reaches over 99.0% at 30\(^\circ\)C, while temperature raise leads to it negligible increase. The experimental data on effects of particular processing parameters on product outlet and content in it different salts have confirmed and explained.

Keywords: calcium nitrate, ammonium nitrate, ammonium carbonate, calcium carbonate, solubility, isotherm, liquid and solid phase, and conversion.

Highlights:

* There have been the data on heterogeneous phase equilibriums in the systems.
* There have been built their solubility at 30 and 60\(^\circ\)C.
* Revealed the concentrated ranges of equilibrium solid phases subsistence.
* The data can be contributed for foundation of technological regime at processing Ca(NO\(_3\))\(_2\).
References


3. Postanovlenie Kabineta Ministrov Respuliki Uzbekistan Nr 163 ot 6 iunya 2012 g. «O merah po realizatcii investitsionnogo proekta «Rasşhirenie sushestvujucshego proizvodstva po obogasheniyu fosforitnogo syrya» na baze deystvujucsheg Kyzylkumskogo fosforitovogo kompleksa GP «Navoiyskiy GMK».


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U.K.Alimov, Sh.S. Namazov, A.M.Reymov, B.S.Zakirov

CYCLIC APPROACH OF DOUBLE AND TRIPLE Superphosphate BASED ON PHOSPHORITE FROM CENTRAL KYZYL KUM

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Abstract. Background. Double superphosphate is the most perspective phosphoric fertilizer obtaining by phosphoric acid decomposition of natural phosphate (apatite and phosphorite). Double superphosphate is the most effective when applied under autumn ploughing. Existing approaches for processing phosphate in double superphosphate have some drawbacks that related with quality of phosphate raw material and instruments-technological designs. Advantage of cyclic approach for double superphosphate obtaining concluded in application any kind of phosphate raw material with high decomposition coefficient and reliability of instruments-technological designs.

Purpose. The aim of the study is investigation of neutralization process of mono basic calcium phosphate (MKP) obtained in decomposition washed and burnt phosphate concentrate (WBPC) from Central Kyzyl Kum phosphorites in redundant norm of evaporated wet-process phosphoric acid (WPA) with various reagents.

Methodology. The separation process of MKP off mother solution is realized by centrifugation. The samples of phosphoric fertilizer were analyzed for content of total (P$_2$O$_5$)$^{\text{tot.}}$, acceptable (P$_2$O$_5$)$^{\text{acc.}}$ and water-soluble (P$_2$O$_5$)$^{\text{wat.}}$ form of phosphorus by photo-calorimetric technique, free form (P$_2$O$_5$)$^{\text{free}}$ – potentiometric one, CaO – complexometric one, N – distillation one by Kjeldale.

Originality. The first time there has been the obtaining process of complex and single phosphoric fertilizer on cyclic approach depending the pH and norm of P$_2$O$_5^{\text{free}}$ in MKP from stoichiometry in a range from 70 to 100 °C.

Findings. The process of WBPC decomposition in evaporated WPA 40.74% P$_2$O$_5$ concentration with 350% norm of stoichiometry and at a temperature of 85°C, has been conducted. There have been established the optimal regimes for conducting neutralization process of the acidic MKP in 25% solution of ammonia, calcium carbonate, unhydrated lime, WBPC, phosphorite flour (PF), and mineralized mass (MM) at temperature 80°C for 30 min. Complex and single phosphoric fertilizer such as double and triple superphosphate were obtained. It has been found that nitrogen-phosphate fertilizer’s granules possess high static strength not less 3 MPa, and single fertilizer has static strength over 2 MPa.

Keywords: Washed and burnt phosphate concentrate, wet-processing phosphoric acid, mono basic calcium phosphate, neutralizing agents, fertilizer.

Highlights:

* There are obtained the high acceptable and water-soluble form of phosphoric fertilizer.

* Total nutrients (N + P$_2$O$_5$ + CaO) in NP fertilizer is from 73,63 to 74,24%.

Citation: U.K. Alimov, Sh.S. Namazov, A.M. Reymov, B.S. Zakirov. Cyclic approach of double and triple superphosphate based on phosphorite from central kyzyl kum // Uzbek chemical journal. -2016. –Nr5. –P.27-34.

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References

12. Synthesis of precursors homologous series Bi$_{1.7}$Pb$_{0.3}$Sr$_2$Ca$_{(n-1)}$Cu$_n$O$_y$ with n=3-20, obtained from glass crystal precursors synthesized in a solar furnace. Institute of Material Sciences SPA "PHYSICS - SUN" Academy of Sciences Republic of Uzbekistan, e-mail: siroj-1705@mail.ru

** Abstract. Background. ** At present, a the high-temperature superconductors with general formula Bi$_{1.7}$Pb$_{0.3}$Sr$_2$Ca$_{(n-1)}$Cu$_n$O$_y$ with n=1÷3 detailed study of preparation for the methods and properties. However, information on the phase-homologues properties with n≥4 is limited. The use of solar energy as a heat source, presumably reduces target phase synthesis time and allowed the possibility of obtaining a phase n≥4.

** Purpose. ** The phase composition of superconductors homologous series Bi$_{1.7}$Pb$_{0.3}$Sr$_2$Ca$_{(n-1)}$Cu$_n$O$_y$ (n=3-20) and definition of the parameters of the unit cell of the superconducting phase, obtained from the glass-crystalline precursors is the main goal of the paper.

** Methodology. ** Synthesis of precursors homologous series Bi$_{1.7}$Pb$_{0.3}$Sr$_2$Ca$_{(n-1)}$Cu$_n$O$_y$ nominal compositions
n=3÷20 were carried out under the influence of concentrated solar radiation in the solar oven and solar simulators at a density of radiant flux of ~ 680÷750 W/cm², followed by quenching melt at over 10°/grad/sec. The subsequent synthesis was performed by solid phase superconducting method in a muffle furnace.

**Originality.** The possibility of obtaining glass-superconductive crystalline precursor compounds of the homologous series Bi₁ₓPb₀.₃Sr₂Caₓ₋₁CuₓO₇₋₂ (n=3÷20) under the action of concentrated solar radiation, followed by quenching of the melt and the high-temperature superconducting phases synthesis based on the obtained precursors was investigated.

**Findings.** In the formation of nanosized precursors found crystalline phases, presumably attributed to the low-temperature superconducting phases with n=1 and n=2 and the high temperature superconducting phase with n=3. The formation of new phases, which one is stable up to a temperature of 700°C. The second, is the high-temperature superconducting phase with increased unit cell parameters: a=3,9015 Å; b=3,8184 Å; c=135,5947 Å, existed in a temperature interval of 800÷846°C.

**Keywords:** a homologous series, the phase composition, the critical temperature, the parameters of the cell, Solar Technology.

**Highlights:**

* The glass ceramic precursors were synthesized under the influence of concentrated solar energy.

* The HTSC phase (846°C) have increased of the values of cell parameters: a=3,9015 Å; b=3,8184 Å; c=135,5947 Å.

* Increasing the content of CaO and CuO leading to destabilization of the glass phase.

**Citation:** S. X. Bobokulov, H. N. Bahronov, V.P. Shevchenko, A. A. Nebesniy, J. Sh. Turdiyev. Study of phase composition of the superconductor homologous series Bi₁ₓPb₀.₃Sr₂Caₓ₋₁CuₓO₇₋₂ (n = 3-20), obtained from glass crystal precursors synthesized in a solar furnace // Uzbek chemical journal. - 2016. -Nr5. -P.34-41.

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**References**


PRODUCTION TECHNOLOGY OF HIGH-ALUMINA REFRactories ON THE BASIS OF ShURTAN GAS-CHEMICAL COMPLEX’ USED SORBENT AND ENRICHED KAOLIN

Institute of General and Inorganic Chemistry, Uzbek Academy of Science

Abstract. Background. High-aluminous refractories are purchased abroad as their local production is lacked. Industry of their production was prevented by suitable alumina containing raw material's deposit deficiency. However, there are some prerequisites for their production based on high-aluminous anthropogenic waste from Shurtan gas-chemical complex (ShGCC).

Purpose - developing of charge’s compositions and technological parameters to obtain mullite-corundum refractories based on the used ShGCC sorbent.

Methodology. The research has been carried out on the basis of sintering mixture of the used ShGCC sorbent with AKF-78 kaolin. Based on the developed compositions and process parameters, there
have been produced the pilot batches of high-aluminous chamotte and mullite-corundum refractories with grade MKS-72.

**Originality.** For the first time the samples of mullite-corundum high refractories have been generated and studied based on the used sorbent that is utilized for cleaning polyethylene from ShGCC by sintering with enriched AKF-78 kaolin. The pilot batches of high-aluminous chamotte containing $\mathrm{Al}_2\mathrm{O}_3$ over 84 % and mullite-corundum wares based on it are produced.

**Findings.** The mullite and mullite-corundum refractories are synthesized by sintering the used ShGCC sorbent with AKF-78 kaolin under ratio 60-90 % at 1600 $\degree\mathrm{C}$. In the ceramic workshop of JSC “UzKTJM”, the pilot batch of mullite-corundum chamotte containing 84% of $\mathrm{Al}_2\mathrm{O}_3$ has been produced by sintering wares from molding containing 85% of fractionated mullite-corundum chamotte with 15% of AKF-78 kaolin at 1550 $\degree\mathrm{C}$. The pilot batch of mullite-corundum bricks marked as MKS-72 meeting the requirements of State Standard 24704-96 is obtained.

**Keywords:** high-aluminous refractories, local raw material, sorbent-waste, chemical-mineralogical compositions, pilot samples, physical-chemical and mechanical properties, mullite-corundum wares.

**Highlights:**
* The refractories based on sintering of industrial waste and AKF-78 kaolin are obtained and studied.
* The pilot batches of high-aluminous chamotte and mullite-corundum wares are produced.

**Citation:** K.F Tadjiev, D.Sh. Shakarova, N.S. Kurbanova, P.A. Arifov. Production technology of high-alumina refractories on the basis of shurtan gas-chemical complex’ used sorbent and enriched kaolin // Uzbek chemical journal. -2016. -Nr5. -P.41-47.

**References**
MODIFICATION OF POLYMERIC BINDER – CHARGE’S COMPONENT FOR MOLYBDENUM CONCENTRATE GRANULATING

Institute of general & inorganic chemistry of Uzbekistan Academy of sciences, Tashkent city, Uzbekistan

Abstract. Background. The charge for the granulation of molybdenite concentrate at JSC “Almalyk GMK” contains up to 10% kaolin, reducing the Mo content in the cinder. An alternative composition of the kaolin based on polymer SK (0.7% in the batch, with a residual concentration of 2% kaolin) is developed devoid of this disadvantage. However, in the process of testing its negative feature - corrosive effect to metal parts of baking oven and sticking of granules is revealed.

Purpose. Creating a batch granulation composition, facilitating the extraction of Re and Mo-M-concentrate cinder devoid of negative characteristics - corrosive effect on metal parts of baking oven and pellet blocking.

Methodology. The approach is based on a comparison of the strength and processing characteristics of binders: kaolin and alternatives to it, of organic nature, a part of the granules and cinders of Mo concentrate. The kinematic viscosity of the binder solution was measured by viscometer VPJ-2. Granules of Mo-concentrate were calcined at 600 °C. Durability was evaluated under a load. Elemental analysis of pellets was fulfilled at Perkin-Elmer spectrometer 3030V and 7500 Aligent ICP MS.

Originality. Organic binders have been developed, balling charge components of Mo concentrate, based on the product of the hydrolysis of polyacrylonitrile and polyacrylamide-GS.

Findings. SC-N product is proposed, which is produced by hydrolysis of polyacrylonitrile at molar ratio: NaOH = 1.0: 0.6, in contrast to the SC polymer (1.0: 1.0), neutralized to pH 7 with H2SO4. Alternative ashless organic binders are proposed for the same purpose: polyacrylamide-GS (PAA-GS) and of NH4-
CMC. Based on the PAA-GS binder has been developed with a new composition of the charge of Mo-concentrate granulation, % weight: Mo concentrate 97.5%; kaolin 2%, polymer PAA-GS 0.5%, in compare with an existing composition (10% kaolin, rest - Mo concentrate) that facilitates the recovery of Re, Mo from the calcine and being devoid of lack in charge with the SK binder.

**Keywords:** candle, molybdenite concentrates, binder, kaolin, organic polymer

**Highlights:**

* Binder of Mo concentrate’s pelleting charge - polyacrylonitrile;
* Binder of Mo concentrate’s pelleting charge - polyacrylamide-GS.
* Binder of Mo concentrate’s pelleting charge - NH4-CMC;
* Development of organic binders, charge components with Mo concentrate;
* Charge’s composition, %: Mo concentrate 97.5; kaolin 2; PAA-GS 0.5.

**Citation:** E.T.Safarov, V.P.Guro, M.A.Ibragimova. Modification of polymeric binder - charge’s component for molybdenum concentrate granulating // Uzbek chemical journal. -2016. -Nr5. -P.48-54.

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**References**


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A.T.Dadakhodjaev, I.B.Ulbasheva, L.R.Farzutdinova

PRODUCTION OF POTASSIUM SULFATE FROM LOCAL RAW MATERIAL RESOURCES

AO «MAXAM-CHIRCHIQ», E-mail: at.dadaxodjaev@maxam-chirchiq.uz [19]

Abstract. Background. In Uzbekistan, after start-up and development of potash production in the UE "Dehkanabad Potash Fertilizer Plant" there was the possibility of organizing the production of potassium compounds including potassium sulphate.


Methodology. The conversion method of producing of potassium sulfate from potash and sodium sulfate is applied.

Originality. As a result of experimental studies of producing potassium sulfate from potassium chloride and ammonium sulfate by conversion method it was shown the degree of conversion of the potassium status of ammonium sulfate. The conversion of potassium chloride with mirabilite by recycling of glazerite solution for residue and cooling options was studied.

Findings. In both embodiments, the potassium sulphate content of potassium in terms of K₂O is revealed to be equal to 45-56%. The optimal technological parameters of process steps are developed. Theoretical yield of potassium sulfate using saturated solutions is found to be 55%, and using crystalline ammonium sulfate - 72%. At JSC «Maxam-Chirchiq» the pilot plant for the production of potassium sulphate of potassium chloride and ammonium sulfate is established. Setting batch possesses a capacity of 500-600 tons / year in two-shift operation. The quality of our products meets
the requirements of the registered in the Agency "Uzstandard" technical standard Ts 00203068-48: 2015.

**Keywords:** potassium sulfate, ammonium sulfate, sodium sulfate, mirabilite.

**Highlights:**

* Применен конверсионный способ производства сульфата калия из хлористого калия и сульфата натрия.


**Citation:** A.T. Dadakhodjaev, I.B. Ulbasheva, L.R. Farzutdinova. Production of potassium sulfate from local raw material resources // Uzbek chemical journal. -2016. –Nr5. –P.54-59.

**Received:** 22.10.2016; **Accepted:** 28.10.2016; **Published:** 31.10.2016

**References**


2. Obzor ryinka sul`fata kaliya v Rossii i mire - "Infomayn" M", fevral` 2010 g.


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UDC: 685.315:541.64:678
A.T.Ibragimov, D.A.Fayzullaeva, A.S.Rafikov

PHYSICAL AND CHEMICAL PROPERTIES OF ACRYLIC AND VINYL COPOLYMERS FOR FOOTWEAR

Tashkent Institute of Textile and Light Industry, Tashkent c.

Abstract. Background. It has long been ready shoes or manufactured part of the component parts, including plantar material are brought to our country from abroad, on the basis of imports, mainly from China. In order, to establish its own production in the footwear industry, osnovonom the use of local raw materials, components and ingredients produced by chemical enterprises of the republic - provide background to ensure import substitution. In this regard, the most important step in solving this problem should start with the joint efforts of scientists from different professions and industry experts on the basis of existing enterprises with the creation of polymeric footwear compositions, followed by the manufacture of materials for shoe sole bottom of the request.

Purpose. identification of possible applications of polymer materials for the manufacture of a bottom of footwear.

Methodology. viscosimetry, pycnometer, thermal analysis.

Originality. So far not carried out such a study related to the use of local raw materials, with a view to the creation of the thermoplastic polymer compositions for the production of sole material shoe bottom. For the first time obtained plantar synthetic materials based on acrylic and vinyl copolymers, which comply with the requirements adopted in the shoe business, and as a result of pilot production tests were recommended for serial production for shoes bottom.

Findings. According to the research in the laboratory set up shoe polymer composition for the manufacture of sole materials. The molecular characteristics, density, and thermal properties of the synthesized copolymers. The molecular weight of the emulsion copolymers of acrylonitrile and n-butyl methacrylate and vinyl acetate is greater than the same copolymers prepared in solution. The emulsion copolymers have a narrower polydispersity. Polyvinyl acetate, low density polyethylene prepared in the presence also has a higher molecular weight. With the increase in its proportion of vinyl acetate copolymer with polyethylene increases the density and the melting point of the material.

Keywords: copolymer of acrylonitrile, n-butyl methacrylate, low-density polyethylene, vinyl acetate.

Highlights:
* Synthesized acrylic and vinyl copolymers.
* The mechanism of interaction and compatibility of components.
* The optimal amount of polyolefin composition in the polymeric materials.


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References

1. Sravnitelniy analiz fiziko-mehanicheskikh svoystv polimernih podoshvennyh materialov / Pavlinov


9. Материалы 5-ой Международной конференции «Кожа, обувь, одежда и аксессуары», прошедшей 18-20 мая 2016 года выставки-ярмарки в Дворце Творчества Молодежи в Ташкенте.

10. Материалы 20-ой юбилейной Международной конференции «Нефть и Газ», прошедшей 18-20 мая 2016 года выставки-ярмарки в ГВЗ «УЗИЕКСПОЕНТР».


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UDK 547.458.83.

O.R. Akhmedov, Sh.A. Shomurotov, N.T. Muydinov, A.S. Turaev

SYNTHESIS OF CARBOXYMETHYL AND DIALDEHYDE GUAR GUM DERIVATIVES
Abstract. Background. Despite the fact that the guar gum is inexpensive, safe and readily available raw material one of the main drawbacks of this polysaccharide is the presence in the structure of only hydroxyl groups, which complicate the process obtaining of new derivatives of this polysaccharide. Therefore, the introduction into the structure of guar gum with one or more active reactive functional groups allows not only to simplify the process of obtaining new derivatives, but also to expand their field of application.

Purpose. To obtain new derivatives of guar gum containing active structure reactive functional groups. To determine optimal conditions of the reaction.

Methodology. The structure and composition of the obtained compounds were studied by infrared spectroscopy, X-ray analysis, and reverse iodometric titration.

Originality. For the first time guar gum derivatives containing in the structure both carboxymethyl and dialdehyde groups were obtained.

Findings. These studies obtained dialdehyde derivatives of carboxymethyl guar gum. The structure and composition of the obtained compounds were studied by infrared spectroscopy, X-ray analysis, and reverse iodometric titration. It was found that concentration of NaIO$_4$, time and the size $\gamma$ affects the degree of oxidation of Na-KMGK. The optimal conditions for the reaction allowing entering the required amount of carboxymethyl and aldehyde groups in the structure of guar gum were found.

Keywords: guar gum, carboxymethylation, degree of substitution, solubility, periodate oxidation, dialdehyde derivatives, oxidation rate.

Highlights.

* New derivatives of guar gum were obtained.
* Their properties were studied.


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References

STUDY OF FEATURES OF CHEMICAL CROSSLINKING OF POLYGALACTURONIC ACID WITH FORMALDEHYDE

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Abstract. Background. Various new materials with valuable properties can be obtained by modification of polysaccharides due to the existence of numerous reactive groups. The crosslinking with formaldehyde is considered as one of the modification method for polysaccharides, which enables obtaining of compounds with a high swelling capacity.

Purpose. The aim of the study is investigation of features of chemical crosslinking reaction of polygalacturonic acid with formaldehyde, and study of dependence of the degree of swelling of polygalacturonic acid upon the degree of crosslinking.

Methodology. In the studies physical and chemical methods of analysis were used, in particular, the structure of the samples was studied by IR spectroscopy, the content of formaldehyde bound was determined by spectrophotometry method.

Originality. In the article, features of chemical crosslinking reaction of polygalacturonic acid with
formaldehyde was firstly studied, and regulating the degree of swelling of polygalacturonic acid by varying of the degree of crosslinking was established.

Findings. The reaction of polygalacturonic acid and formaldehyde was studied. This reaction occurs between the OH groups of polygalacturonic acid and carbonyl groups of formaldehyde. It has been established that the reaction includes two parallel reactions, which are monofunctional and bifunctional (cross) linking of formaldehyde. The studies showed that in the reaction, -COOH groups of polygalacturonic acid also involves together with -OH groups.

The influence of reaction conditions on the degree of crosslinking of polygalacturonic acid was studied. Increase in degree of crosslinking with increase in the amount of formaldehyde was determined, and the effect of temperature on the reaction rate was not sensible.

Furthermore, the dependence of swelling degree of polygalacturonic acid and the degree of crosslinking was studied. It is found that the swelling degree decreases with increasing in degree of crosslinking of polygalacturonic acid.

Keywords: Polygalacturonic acid, formaldehyde, chemical crosslinking, degree of swelling, chemical modification.

Highlights:

* New swellable materials were obtained.

* Their chemical parameters were also studied.

Citation: N.T.Muydinov, Sh.A.Shomurotov, O.R.Ahmedov, A.S.Turaev. Study of features of chemical crosslinking of polygalacturonic acid with formaldehyde // Uzbek chemical journal. -2016. -Nr5. -P.72-78.

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References

7. Ge L., Li X., Zhang R., Yang T., , Ye X., Li D., Mu Ch. Development and characterization of dialdehyde xanthan gum crosslinked gelatin based edible films incorporated with amino-
**THE DEVELOPMENT OF NEW INHIBITED SOLUTIONS FOR REMOVAL OF SOLID DEPOSITS FROM THE SURFACE OF OILFIELD EQUIPMENT**

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**Abstract.** *Background.* One of the reasons for the decrease in the efficiency of operation of wells, is the formation of salts that are deposited in the bottomhole zone of wells and surface oilfield equipment. As a rule, salt deposits are: on the walls of the lower portion of production casing, in the offices and working bodies of the centrifugal and rod pumps the inner surface of the tubing. There are formed centers of crystallization and produce new deposits. The scale layer drastically degrades the conductivity of the walls and reduces the cross section of the pipe system of water supply, a decrease and, ultimately, leads to their emergency condition.

**Purpose.** Identifying the nature of the solid salt deposits on the inner surface of oilfield equipment, as well as the development of the method of removal.

**Methodology.** To determine the effectiveness of removing deposits from the surface of the heat developed by the inhibited acid solutions, RTO-1 and RTO-2 were carried out on sediment samples from heat-exchange equipment fishing Kokdumalak. To determine the content of oil products in sediments using the method of extraction with hexane in Soxhlet apparatus. Corrosion measurement was carried out according to existing standards.
**Originality.** Solid crystalline deposits and scum from inner surfaces of pipes and heat exchangers are kept firmly on the tube walls. New inhibited solutions are effective and applicable to modern equipment. They are derived from local raw materials and safe, in respect to corrosion to process equipment.

**Findings.** Specified analyzed the composition of deposits. The results of the study of solutions of the RTO-1 and RTO - 2 for the removal of deposits at different temperatures.

**Keywords:** Crystallization, scaling, dissolution, scale layer, scale formation, corrosion, thermal conductivity.

**Highlights**

- New products solutions brand RTO-1 and RTO-2 are obtained.
- They are designed to remove the scaling in the pipes.

**Citation:** F.M.Yusupov, G.M.Bekturdiev, E.N.Kurbanov, G.A.Baymatova, D.A.Toshmatov. The development of new inhibited solutions for removal of solid deposits from the surface of oilfield equipment // Uzbek chemical journal. -2016. -Nr5. -P.78-84.

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**References**

11. Juravlev V.A., Chausov F.F., Savinskiy S.S. Konkurenty i rost kristallicheskyh I amorfnoy faz v vodnyh rastvorah karbonata I nitrometilfosfonatakalciy// Poverhnost. Rentgenovskie,
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DEVELOPMENT AND PRACTICAL USE OF THE PARAFFIN DISPERSANT FOR DIESEL FUEL

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Abstract. Background. In recent years there has been a steady increase in global demand for diesel fuel. The production of winter diesel fuel means a fuel compliance standards. There is a need to develop a new paraffin dispersants, which would be cheaper, easy to manufacture and would be universal for different depressants, as the best means of improving the low temperature properties of diesel fuels is the use of depressant-dispersant additives.

Purpose – development of the paraffin dispersant for diesel fuel on the basis of alkyl methacrylates

Methodology. The author used a set of classical and modern research methods allow to determine physical, physical and chemical characteristics, functional composition, to study the processes occurring in diesel fuel, subjected to various processes. In the synthesis of the paraffin dispersant used in oil-soluble nitrogen-containing organic compound possessing surface-active properties to the system – the crystals of the wax – liquid hydrocarbon fuel, which are fatty aliphatic amines with a long alkyl radicals from C_{16} to C_{24}. The reaction proceeded by the mechanism of nucleophilic accession of the amine to the double bond.

Consistently carried out the synthesis of alkyl esters of acrylic and itaconic acids, by the esterification of acrylic acid with fatty alcohols in a solvent using an acid catalyst, and then realized the reaction of the obtained acrylate with primary and secondary amines.

Originality. For the first time on the basis of the synthesized compounds (n-alkyl esters of acrylic acid) developed a new paraffin dispersant.

Findings. developed a new package of depressor-dispersant additive consisting of a new paraffin dispersant (KD-27) and the depressant additive keroflux 6180 in the ratio 1:3, allows on the basis of summer diesel fuel of Bukhara refinery brand of EKO-L, to obtain diesel fuel brand of EKO-Z-1 to the State standard of Uzbekistan O´zDSt 1134:2007 Rev. No. 2.

Ключевые слова: депрессорная присадка, диспергатор парафинов, дизельное топливо, предельная температура фильтруемости, синтез аминов.

Highlights: developed paraffin dispersant can be successfully used in tandem with a variety of commercially available dispersant additives.


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References


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UDK 665.5

M.J.Makhmudov

STUDY OF THE INFLUENCE OF OCTANE BOOSTER ADDITIVES ON THE QUALITY OF GASOLINE AI-80

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Abstract. Background: The number of high-octane gasoline fractions required from 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. The alternative to this is the use of octane booster additives in the process of producing gasoline at the refinery.

Purpose - research of motor gasoline AI-80 to improve its ecological and detonation properties and compliance with the requirements of modern European specifications.

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. As the object of the study was taken the gasoline AI-80.

Originality: For the first time the effect of octane booster additives MMA (monomethyl aniline) and MTBE (methyl tertiary butyl ether) on the commercial gasoline AI-80 with identifying ways to improve its detonation properties was investigated.

Findings: With the additive MTBE, the octane number of gasoline AI-80 by IM (investigation method) increased from 80.8 to 90.2. When adding MMA in the amount 0.5-2.5 vol.% to the base gasoline of AI-80, the octane number increased by MM (motor method) to an average of 2.8 units and by IM to 4.3.

Key words: gasoline, isopropyl alcohol (IPA), methyl tertiary butyl ether (MTBE), monomethyl aniline (MMA), octane number

Highlights:
* Increasing of the octane number gasoline AI-80 by adding additives MMA and MTBE was established.
* The changes of physical - chemical properties of gasoline before and after adding of additives were determined.

Citation: M.J.Makhmudov. Study of the influence of octane booster additives on the quality of gasoline AI-80 // Uzbek chemical journal. -2016. -Nr5. -P.91-96.

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References


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