

ABSTRACTS

UDC 643.336547.128

Experimental stand for measuring flow characteristics non-Newtonian fluid / E.V. BILETSKIY // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 3 – 10. – Bibliogr.: 5 names. – ISSN 2079-0821.

The article considers a promising way to study the rheological characteristics of non-Newtonian fluid flows such as cost, viscosity and yield stress, which is important from the point of view of efficiency of the percolation process of food in chemical industries. There are comparative results of theoretical and experimental data in the article.

The use of the experimental stand and resolved mathematical equations made it possible to evaluate rheological characteristics of a wide range of materials without complicated and costly experimental equipment. The article presents comparative data of expected theoretical solutions, which agree well with the experimental results.

While processing the experimental data, methods of variational statistics of the regression and dispersion analysis as well as experimental data results were used. The obtained values of the Fisher's test showed that the average discrepancy between theoretical curves and experimental data was not over 5%, which confirms the obtained results.

Keywords: non-Newtonian fluids, rheological characteristics, viscosity, yield stress, flow, device, pressure.

UDC 681.5:661.333.3.

Estimation of some parameters of objects of production of soda the recursive methods / A. A. BOBUKH, D. A. KOVALYOV, M. A. PODUSTOV, A. N. PEREVERZIEVA // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 11 – 16. – Bibliogr.: 4 names. – ISSN 2079-0821.

One of major tasks arising up at development of computer-integrated control system for the row of objects of production of the calcinated soda on an ammoniac method with the use of microprocessor-based comptrollers are authentication of mathematical models of control objects and their periodic adjustment on the well-known entry and output parameters of objects. For the decision of tasks of authentication on the well-known entry and output parameters of objects in the article possibility of application of methods of stochastic approximation and recursive regression is investigated at comparing of them to the least-squares method. In the article the different methods of filtration of measureable values of parameters of technological processes are analyzed used for development of computer-integrated control system for the row of objects of production of the calcinated soda on an ammoniac method. It is got at comparison of the considered methods, that the method of recursive regression allows to get higher exactness of authentication, what method of stochastic approximation. For the chosen method - prognostication of changes of parameters of these processes is executed recursive regression with the purpose of operative control by them.

Keywords: computer-integrated control system, methods of filtration, production of the calcinated soda, separation of filtration, separation of carbonating, microprocessor-based comptroller.

Electrochemical reduction of iron from Fe (III) based electrolyts / M.V. VED', A.V. KARAKURKCHI, T.A. IL'YASHENKO, I.YU. YERMOLENKO // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 16 – 24. – Bibliogr.: 14 names. – ISSN 2079-0821.

The paper presents analysis voltammetric studies of the iron cathodic reduction from the Fe^{3+} based electrolytes. The metabolic reaction and equilibrium in solutions with variable pH is investigated. The ratio of ionic forms Fe (III) is defined. It is shown that under cathodic polarization simultaneous discharge of Fe^{3+} , FeOH^{2+} and FeO^+ ions occurs. The concentration ratio of active particles in the solution, as the pH of the electrolyte is determined by the initial concentration of Fe^{3+} ions and the hydrolysis degree. Characteristic parameters of the electrochemical reaction Semerano criterion $X_s = 0,5$ and concentration criterion $X_c = 1$ indicates irreversibility of the cathode process. Using the algorithm analysis of polarization dependency set staging and mechanism of the process. It is shown that the electrochemical reduction of iron (III) is limited by the charge transfer stage and by the adsorption of FeOH^{2+} ions on the electrode surface with future dissociation of FeOH^+ ions. These results create a theoretical basis for the development of a stable iron (III) based electrolyte for the iron alloy plating.

Keywords: adsorption, hydrolysis, iron, kinetics, cathodic reduction, mechanism of the process, electrolyte.

The electrochemical reactor for the synthesis of high-pure low-concentrated sodium hypochlorite solutions. / D.V. GIRENKO, A.B. VELICHENKO // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 25 – 36. – Bibliogr.: 12 names. – ISSN 2079-0821.

Aqueous solutions of sodium hypochlorite show high biological activity and are widely used in medicine and veterinary medicine. Such drugs must meet the requirements of high purity (absence of impurities of organic and inorganic substances that are toxic to humans and animals). The main obstacle to the active use of such drugs is the lack of effective production technology of pure and stable sodium hypochlorite solutions. The technology of production of sodium hypochlorite solutions of high purity was developed. The basic element of a manufacturing scheme is the electrochemical reactor, where the synthesis of sodium hypochlorite is carried out in the connected flow-type electrochemical cells without separating the electrode spaces with a titanium cathode and composite SnO_2 -base oxide anode. The device is equipped with a microprocessor control system of its operation and with self-unit module of initial solution supply, fulfilled on the basis of a peristaltic pump. The influence of various factors on the synthesis of sodium hypochlorite was studied. Under the current load of 2.0 A and the initial concentration of sodium chloride of 9 g/liter one plant, which comprises two series-connected cells, allows to obtain 8.2 liter/h of the solution with pH 8.5, containing 540 mg/liter NaClO and 2 mg/liter NaClO_3 .

Keywords: sodium hypochlorite, electrolysis, medicine, veterinary.

Appropriate Resource-saving Technology of Printed Board Etching with the use of an Acidic and Alkaline Copper Chloride Solutions / M.A. DOBRIYAN, V.I. LARIN, E.B. KHOBOTOVA, O.I. YURCHENKO, L.M. YEGOROVA, A.A. PRAVDA, V.V. LYASHENKO // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 37 – 46. – Bibliogr.: 6 names. – ISSN 2079-0821.

The compositions of initial and waste acidic and alkaline printed board etching solutions well as of the adjusting solutions, washing water and water used for the preparation of these solutions and finish printed board rinsing, are investigated on basic components and impurities. Foreign impurities arising during technological solutions usage has been established to influence not the printed board etching process, therefore the quality of printed boards. Waste technological solutions has been shown to be useful as counterflow-aluate water could be useful for the preparation of finishing ammoniac rinsing solution. Waste solution of finishing ammoniac rinsing could be useful for the initial ammoniac rinsing aluate preparation.

Waste solution of the initial ammoniac rinsing could be useful for the adjusting etching solution preparation. Methods of regeneration of copper oxychloride (fungicide) as well as ammonium chloride recycling into technological process of printed board etching have been elaborated and supported with certificates of authorship and patents. Copper oxychloride regenerated from waste etching solutions corresponds to the first quality according to GOST 13200-73 “Copper oxychloride 90 % wettable powder. Specifications”. The technology elaborated is proved with industrial tests and implemented into production.

Key words: appropriate technology, printed board, etching, technological solutions, copper chloride, ammonium chloride, copper oxychloride.

UDC 666.942.82 : 553.612

Portland cement clinker with the varieties of kaolin / N.O. DOROGAN, V.A. SVIDERSKYI, L.P. CHERNIAK // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 46 – 53. – Bibliogr.: 5 names. – ISSN 2079-0821.

The data are given on the dependence of portlandcement clinker properties on the kaolin variety in the composition of raw mixture. It is shown that the use of kaolines of Ukraine in the raw mixture, which are different by genesis, degree of enrichment, and chemical and mineralogical composition is an important factor influencing the clinker properties and the processes of phase transformations during firing. It is shown a possibility of optimizing the composition of raw mixture and the analysis of dependence of the clinker phase composition using a new computer program. Intensification of C_3S and C_2S formation in the clinker using unenriched alkaline kaolin is associated both with the relatively higher concentration of calcite and quartz in the raw mixture, and with crystallization in the presence of more developed liquid phase due to feldspar. The achieved minimization of formation of iron-containing crystalline phases determines the possibility of increasing the clinker and cement whiteness on its basis.

Key words: portland cement, clinker, kaolin, composition, raw mixture, structure, phases.

Level transmitter for liquid / *A.N. DUBOVETS, I.I. LITVINENKO, M.A. PODUSTOV, E.I. LITVINENKO* // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 54 – 59. Bibliogr.: 2 names. – ISSN 2079-0821.

Upgraded hydrostatic level transmitter due to the same effective surface area of the membranes and different lengths of the shoulders is a U-shaped rocker. The conditions for the equivalence of the reaction membrane to the change in the liquid level, increased sensitivity, reduced error, provided the choice of the optimal threshold level due to the possibility of moving and fixing the plunger and ka-carcass sensor installed respectively on the console inside the guide, and expanding the range of use.

Is the possibility of using the design of the sensor is equal membranes, which creates conditions for the equivalence of their reaction-tion on the change in the liquid level in the technological object.

Decreases the sensitivity threshold, which is set-ment of the plunger on the console attached to the larger end of the shoulder is a U-shaped rocker arm and leads at the same time and increase the feeling of reality and to reduce measurement error.

Possibility of choosing the optimal threshold level due to the ability to move and perform the function-ing of the plunger and coil differential sensor in the vertical direction, expanding the scope of its use.

Keywords: gauge, hydrostatic, upgraded sensitivity, error-ness, console, plunger, reaction, equivalence, density.

UDC 661.43+66.088

The effect of pressure in the plasma-chemical reactor for process of plasma treatment solutions of sodium chloride / *R.I. ZAKHAROV, A.N. KALASHNIKOVA, A.A. PIVOVAROV, N.V. NIKOLENKO* // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 60 – 72. – Bibliogr.: 7 names. – ISSN 2079-0821.

The method of mathematical modeling and experimentally was studied the effect of pressure in the plasma-chemical reactor for the synthesis of mixtures of H_2O_2 and ClO_2^- . The parameters optimization process was considered the selectivity, speed and power consumption. The optimal pressure and the optimal duration the process of plasma treatment of NaCl solution were determined. For the pressure range from 0.1 to 1 atm experimentally was confirmed the calculated values of the optimal time at which is achieved the maximum selectivity by the process of chlorite ions. It has been shown that the synthesis method of oxidizing plasma treatment solutions of sodium chloride are optimally carried out at atmospheric pressure, this ensures a sufficiently high yield of the total oxidant concentration at the greatest amount of sodium chlorite as the most valuable product of the synthesis. While is maintaining a relatively high rate of the process at the lowest cost of electricity.

Keywords: plasma, pressure, chlorite, reactor, hydrogen peroxide, sodium chloride.

The study of the processes of barium-containing cement mineral formation based on monoaluminat and barium hexaferrite / M.Y. IVASHCHENKO, G.N. SHABANOVA, M.I. VOROZHBIIAN, O.V. KOSTYRKIN, N.S. TSAPKO // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 73 – 79. – Bibliogr.: 3 names. – ISSN 2079-0821.

The processes of barium containing cements based on $\text{BaO} - \text{Al}_2\text{O}_3 - \text{Fe}_2\text{O}_3$ system compositions have been studied. The availability of free baryta has been determined in the obtained samples, that allowed us to calculate the degree of transubstantiation and to determine the constant of mineral formation reaction speed for each temperature. In order to prove the conducted research concerning the smoothness of baryta fixation and the formation of mono-aluminate and hexaferrite of barium under the specified temperatures and isothermic soakings, X-ray analysis of cakes has been conducted. The phase formation processes in barium containing cement take place at the expense of the reactions in a solid phase, the speed of which is described satisfactorily by Ginstling-Brounshtein equation. The technological parameters of barium containing cement synthesis on the base of $\text{BaO} - \text{Al}_2\text{O}_3 - \text{Fe}_2\text{O}_3$ system compositions have been determined. The obtained results allow performing purposeful phase synthesis in $\text{BaO} - \text{Al}_2\text{O}_3 - \text{Fe}_2\text{O}_3$ system and make it possible to regulate technologically phase relation under the synthesis of barium containing cements based on mono-aluminate and hexaferrite of barium.

Key words: cement, phase formation mechanism, degree of transubstantiation, reaction speed, mono-aluminate of barium, hexaferrite of barium.

UDC 666.9.015.42:666.971.3

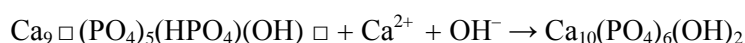
The lime-silica mixture hydration under aluminium (III) chloride influence at the energy-saving technological parameters of autoclaving. Part I. Development of energy-saving technological parameters autoclaving of silica brick with the addition of aluminum (III) chloride / S. KISELEVA // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, chimichna tekhnologiya ta ecolohiya). – P. 80 – 86. – Bibliogr.: 11 names. – ISSN 2079-0821.

The processes of hydration in modified lime-sand mixtures have been studied. The influence of a complex additive based on waste substances of grinding bodies for ball mills and the solution of aluminium (III) chloride on physics-mechanical properties of silicate material has been analyzed in this part of the article. The solution of aluminium (III) chloride, as it has been shown, influences the process of hydration of binding at the stage of slaking. The use of a complex additive allows both reducing the pressure of autoclave procession and the time of product soaking under pressure. The samples of a high-strength silicate brick have been produced under energy-saving process-dependent parameters of autoclave processing. It has been shown that the introduction of a complex additive into a lime-sand raw mixture allows reducing power consumption. Ecological aspect concerning the reduction of environmental impacts is of great importance. It is connected with the utilization of waste substances of grinding bodies, the decreasing of thermal pollution and the reduction of hazardous pollutant emission into the atmosphere. The results of hydration products study in modified lime-silica mixture for silicate brick production have been analyzed in the second part of the article.

Keywords: silicate brick, autoclaving, wastes utilization, complex additive, energy-saving.

Krivilyova S.P. Hybrid polymerceramic composite material on the basis of calcium phosphate for a plasticity of defects of an articulate cartilage / S.P. KRIVILYOVA, O.M. RASSOHA // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 87 – 91. – Bibliogr.: 6 names. – ISSN 2079-0821.

In article the analysis of possibility of use hybrid polymerceramic composite materials for a plasticity of defects of an articulate cartilage is carried out, their disadvantages are analysed. Developed perspective composite is a polymer matrix based on polyacrylic acid and polyethylene oxide with a uniformly distributed therein an inorganic filler – fine-grained powder based on calcium phosphates ($\text{Ca}_3(\text{PO}_4)_2$ and others). The raw materials used CaO , CaF_2 , H_3PO_4 , $\text{Ca}(\text{OH})_2$, CaCO_3 , $\text{Ca}_2\text{P}_2\text{O}_7$, polyacrylic acid and polyethylene oxide. Studied the properties and behavior in a physiological environment of an organism. We considered the chemistry of the interaction with the filler of liquid medium. Specifically, in the presence of water the partial hydrolysis takes place and being inherently apatite $\text{Ca}_3(\text{PO}_4)_2$ is transformed into hydroxyapatite of nonstoichiometric composition $\text{Ca}_9 \square (\text{PO}_4)_5(\text{HPO}_4)(\text{OH})\square$, channels which only half-filled with water. In the sequel with a long stay in the physiological environment of the organism containing ions Ca^{2+} and OH^- , it consumes ions OH^- and Ca^{2+} :



and transformed into hydroxyapatite $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$ stoichiometric composition ($\text{Ca}/\text{P} = 1,67$).

Keywords: hybrid polymerceramic composite material, hydroxyapatite, tricalcium phosphate, hydration.

Technological aspects of the research growth-regulatory activity of substituted pyrrolecarboxylic acids on rye variety «Dihar» / O.I. MIKHEDKINA, A.O. ZAPOROZHETS, L.V. KRICHKOVSKAYA, U.I. BURIK, I.I. KLIMENKO, O.S. PELIPETS, I.V. PERETYATKO // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 92 – 98. Bibliogr.: 8 names. – ISSN 2079-0821.

A series of novel substituted pyrrolecarboxylic acids and proposed technological approaches to the production of effective growth of plants based on them. These compounds are used for presowing treatment of seeds or for the treatment of above-ground plant organs for the purpose of process control growth and development, and to improve product quality and increase productivity. At the same time the natural compounds are safe, and synthetic are cheap. An important factor in this process is the high solubility of synthetic preparations in water. The issues of solubility of these compounds for use as drugs agrochemical use. Therefore the relevance of the chosen topic is the search of chemical plant growth regulators, who have a high biological assets and adequately are soluble in water. Physiological activity of the compounds was investigated according to the degree of influence of aqueous solutions of salts on germination energy and germination of substandard seeds of winter rye variety "Dihar" 2009. Based on the results of laboratory tests reliably detected activity of the compounds, which depends on the nature of the compound and the specifics of seed varieties.

Keywords: pyrrole, carboxylic acid, solubility, physiological activity, rye, germination energy, germination, plant growth regulators.

The effect of nitric acid on the composition of the products of interaction with waste cobalt-containing catalyst / O.V. SUVORIN, V.O. LOBOIKO, A.S. SAVENKOV, O.H. SHUTINSKYI, V.O. SUVORIN // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 99 – 104. – Bibliogr.: 5 names. – ISSN 2079-0821.

Combined process of chemisorption of nitrogen oxides NO and NO₂ from their mixtures with air and extraction of metals from the catalyst in the aqueous solution in contact with the spent catalyst and being simultaneously chemisorbents and extractant is the basis of resource utilization technology developed spent catalysts and exhaust nitrous gases production of catalysts.

Study results on the effect of concentration of nitric acid in the product composition of its interaction with the metallic cobalt in the temperature range 20 – 25 °C were presented. Intervals of concentrations of nitric acid, in which as byproducts of the interaction mainly formed ammonium nitrate, nitrogen and nitrogen oxides (I, II, IV) were installed. The region of nitric acid concentrations, in which the interaction of cobalt observed minimal loss of fixed nitrogen, was determined. It was shown that the proportion of reactions leading to the formation of NO and NO₂ as by-products of nitric acid concentration of more than 10 % greater than 15 % and in a combined chemisorptions-extraction process in the system with-holding cobalt-containing catalyst to achieve a concentration of nitric acid was not advisable.

The consideration of these data allows one side to regulate of NH₄NO₃-containing solution of nitrate of cobalt, and the other – to influence the loss of fixed nitrogen in the combined process of chemisorption of NO_x and extraction of Co²⁺ cobalt from spent catalysts.

Keywords: metal cobalt, nitric acid, concentration, products of interaction, the proportion of the reaction, nitrogen oxides, nitrogen, ammonium nitrate.

A mathematical model of the combined process of nitrogen oxides (II, IV) chemisorption and the extraction of metals from spent catalysts / A.V. SUVORIN // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 105 – 110. – Bibliogr.: 7 names. – ISSN 2079-0821.

In the article, on the basis of the known laws of chemical and technological processes, presents a mathematical model output combined process of nitrogen oxides (II, IV) chemisorption and extraction of metals from aqueous absorbent irrigated fixed bed of spent catalyst. A model takes into account the processes of oxidization of nitrogen oxide (II) to the nitrogen oxide (IV), interaction between nitrogen oxides (IV) and water with formation of nitric aside, and also it subsequent interaction with reactionary-capable components of spent catalysts and extraction of appearing nitrates of metals in water solution. As reactionary-capable part of spent aluminum-nickel catalyst the oxide of nickel is considered. The offered model allows expecting either the concentrations of components of the system at any moment to time or time, necessary for achievement of the set degree of transformation of matters. For the estimation of border condition on the eventual concentration of nitrogen oxides equalization, got on the basis of experimental data, is offered. Also, it is rotined on the basis of experimental information, that the developed model equalizations of thermal balance does not need.

Keywords: nitrogen oxides, spent catalysts, chemisorption, extraction, combined process, mathematical model

Technological scheme of sub-standard processing of iron dusts and sludges basic metallurgical processes to obtain metallized product / V.P. UL'YANOV, V.I. BULAVIN, A.V. KRAMARENKO, I.V. UL'YANOVA, Y.V. PERMYAKOV // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 111 – 128. – Bibliogr.: 4 names. – ISSN 2079-0821.

The article describes a process flow diagram that provides a new technology reducing heat treatment of iron-containing dusts and unconditioned sludges basic metallurgical processes OJSC «MISW» (Russia) to obtain metallized pellets. Technology appropriate scientific and technical level of the best foreign analogues, but has the advantage that it uses no solid and liquid reductant that provides metallized product with a high degree of metallization and not contain harmful impurities; is a resource and energy saving, eliminates the threat environment and can be used for processing all kinds of iron dusts and sludges in the steel industry as the current output, and the accumulated state. The optimal technological parameters of processing benchmarks efficiency investments on the introduction of technology and the processing results of the calculation of the annual (expected) economic effect from the introduction of processing technologies. It is an outlook cost producing 1 ton of metallized pellets. Co-product – zinc concentrate is recommended in accordance with the technical requirements of All-Russian Research Institute of Nonferrous Metallurgy (Ust-Kamenogorsk, Russia), used in non-ferrous metallurgy as feedstock for the production of zinc, as well as an additive in the manufacture of glass batch.

Keywords: flow chart substandard iron dust and sludge, metallized pellets, processing, storage tanks, tubular rotary kiln, cyclone furnace, shaft cooler.

UDC 666.9

The research of the qualities of radiopaque calcium-barium-silica-alumina cement / N.S. TSAPKO // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 129 – 135. – Bibliogr.: 5 names. – ISSN 2079-0821.

The article is dedicated to the problem of the development of domestic radiopaque cement for dentistry needs. The possibility to obtain such cement on the basis of potassium aluminate and barium disilicate has been considered. The main stages of calcium-barium-silica-alumina cement synthesis have been presented. The data as to the clinker structure, obtained with the help of electronic microscopy have been given. It was determined that the obtained clinker consists of a great amount of glass phase which produces crystals of main phases. The efficient mode of grinding has been chosen. For this purpose measurement of microhardness by the dent of a diamond pyramid on the sample - clinker slice - has been conducted. The main physics- mechanical and technical qualities of the developed cement have been presented as well as the data of specific stomatological tests have been given. It was determined that the obtained calcium-barium-silica-alumina cement meets the demands of stomatological filling endodontic materials.

Keywords: cement, stomatology, filling materials, clinker, structure, qualities, radiopacity.

Regularities the formation of complexes cobalt (II) / Yu.K. HAPON, N.D. SAKHNENKO, M.V. VED, T.A. NENASTINA // Visnyk NTU "KhPI" – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 136 – 140. – Bibliogr.: 9 titles. – ISSN 2079-0821.

In this work method potentiometrically was studied complexation Co (II) with sodium citrate, potassium diphosphate, disodium salt of ethylenediaminetetraacetic acid ($\text{Na}_2\text{H}_2\text{Y}$). The composition monoligand complexes of cobalt (II) at different values and concentrations of complexing ligands was defined. According to the analysis of experimental data, it was found that in systems, $\text{Co}^{2+} - \text{C}_3\text{H}_5\text{O}(\text{COO})_3^{3-}$, $\text{Co}^{2+} - \text{H}_2\text{Y}^{2-}$ with increasing concentration of the ligand complexes have a constant composition, and $\text{Co}^{2+} - \text{P}_2\text{O}_7^{4-}$ tend to change the composition of the complex. The calculated values of the instability constants of complexes create the preconditions for the development of electrolytes for galvanic deposition cobalt coatings, as well as binary and ternary alloys, cobalt with refractory metals, which have higher physical and chemical characteristics, compared with the individual metals. The spent methodology for conducting experiments in the future, is applicable for the determination of mixed complexes cobalt, as well as mono and poliligand complexes of tungsten and molybdenum.

Keywords: potentiometry, coordination number, the instability constant, complex, cobalt, EDTA, citrate ion, monoligandny complex.

UDK 621.35

Formation of nanostructures based on porous niobium oxide / L.V. LYASHOK, A.A. TERESCHENKO // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 141 – 145. – Bibliogr.: 3 names. – ISSN 2079-0821.

Self-organization of nanoscale structures in electrochemical processing is most evident in the formation of porous anodic oxides of metals (aluminum, titanium, niobium, tantalum). These oxides contain arrays oriented perpendicular to the substrate pores. The distinguishing factor of these films is a high degree of order in the arrangement of the pores and the ability to manage varying pore diameter in a wide range.

Intensively carried out research and development of efficient methods for the synthesis of porous anodic oxides of metals, however, has not yet established a common approach to the explanation of the mechanisms of formation of ordered arrays of pores in the anodic oxidation, which greatly hinders the creation of industrial technologies of forming porous metal oxide nanostructures and on their basis.

The features of the electrochemical synthesis of anodic niobium oxides formed in acidic electrolytes with different content of fluoride ion. The physicochemical processes that occur during anodization of niobium. Found that the morphology of the film is associated with changes in the conditions of electrolysis. Under certain conditions, the anodizing nanostructured oxide coating is formed which has a porous layer of self-organized Nb_2O_5 .

Keywords: niobium, forming, anodizing synthesis nanostructures, porous layer, the morphology of the film.

Impedance spectroscopy in the study of the properties of anodic niobium oxide / L.V LYASHOK, Y.V. MIROSHNICHENKO // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Khimiya, khimichna tekhnolohiya ta ecolohiya). – P. 146 – 151. – Bibliogr.: 4 names. – ISSN 2079-0821.

Intensive researches are presently conducted on creation of the porous nanostructured oxides of transitional materials among that particular interest presents the oxide of niobium. This is due to several of its functional properties, such as biocompatibility, photocatalytic activity, which hold the promise of practical use of nano-structured niobium oxide in many areas. By electrochemical impedance spectroscopy to determine the equivalent circuit elements which characterize the basic properties of the synthesized anodic oxide films. It maybe to form anodic tape on niobium, being an array of the nanotubes, oriented athwart підложке, having anamorphous structure or crystalline, possessing superficial porosity, the method of the electrochemical oxidizing. The correlation between the conditions of formation of niobium oxide with its morphological features and semiconducting properties for the directed synthesis of anodic oxide films with desired characteristics and controlled pore geometry. The factors affecting the morphology of the surface oxide films synthesized and their properties are investigated.

Keywords: niobium, anodic oxide film, electrochemical impedance spectroscopy, niobium oxide porous, impedance spectrum, bridge of alternating current.

Study on the possibility of clinker from waste dolomite / V.I. VINNICHENKO, A.N. RYAZANOV // Visnyk NTU «KhPI». – 2014. – № 51 (1093). – (Series: Himiya, himichna tekhnolohiya and ekologiya). – P. XXX – XXX. – Bibliogr: 9 titles ..- ISSN 2079-0821.

In Ukraine present in a presence the deposit of dolomites, raw material of that is used for the production of materials consumed by metallurgical industry. Historically folded so, that in times of work of enterprises plenty of "wastes" is accumulated - shallow factions of dolomites that are in dumps. The data got as a result of burning of dolomite macadam in a muffle stove and sifting out in a running around stove are expounded in the article. Cited data of physical and mechanical tests of the cements got shutting of the ground clinker a bischofite and water solution of chloride of magnesium. It is set on results experimental researches, that the strength indexes of cement at using of bischofite as a sealer exceed analogical indicators at the use of water solution of chlorous magnesium. The estimation of possibility of receipt of dolomite clinker and cement is executed on the basis of sifting out of dolomite, i.e. to that faction that is departure of production of refractoriess for. It is shown that the roasting dolomite clinker consumes almost twice less heat than roasting portlandcement clinker. The investigations on the production of clinker and cement in its base of dolomite and dolomite dropout. Found that the dropout rate is suitable for roasting dolomite clinker.

Key words: dolomite, gravel, clinker, energy, burning, compressive strength, physical and mechanical studies, ecology.