The main common methods of methyl methacrylate producing are acetocyanohydrin method and oxidation of isobutylene and tert-butanol. Because of the significant drawbacks of these methods, it is important to develop new, alternative ways of methyl methacrylate obtaining, one of which could be aldol condensation of methyl propionate with formaldehyde in the gas phase. The actual task for today is to find out effective catalysts for this process.

For this aim, methyl propionate condensation with formaldehyde was studied in the presence of $\text{B}_2\text{O}_3–\text{P}_2\text{O}_5–\text{WO}_3/\text{SiO}_2$ catalyst, which previously has shown high activity in the condensation of propionic acid with formaldehyde to methacrylic acid. The paper also investigates the influence of methanol on the side reaction of methyl propionate hydrolysis; it was found that adding methanol causes a slight increase in MMA selectivity, but the yield of unsaturated products decreases, and therefore adding methanol to the reaction mixture for the MP condensation with $\text{FA}$ over $\text{B}_2\text{O}_3–\text{P}_2\text{O}_5–\text{WO}_3/\text{SiO}_2$ catalyst is impractical, but the yield of unsaturated products decreases, and therefore adding methanol to the reaction mixture for the MP condensation with $\text{FA}$, namely temperature 653 K and contact time 12 s were found. Under these conditions, in the presence of $\text{B}_2\text{O}_3–\text{P}_2\text{O}_5–\text{WO}_3/\text{SiO}_2$ catalyst with an atomic ratio of components $\text{B}:\text{P}:\text{W}:\text{Si}=3:1:0:6$ respectively total yield of MMA and $\text{MMA}$ was 31.91 % while their total selectivity was 32.2 %.

**Keywords:** methyl methacrylate, methacrylic acid, methyl propionate, formaldehyde, catalyst, heterogeneous catalysis, aldol condensation.

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**MICROSILICA INFLUENCE ON THE PHASE CONSTITUTION AND PROPERTIES OF SPINEL-FORMING COMPOSITION (p. 8-12)**

Victoria Pesehanka, Anna Voytyuk, Yaroslav Pitak

Experience in using low cement alumina-magnesia castables, containing spinel-forming reagents, in monolithic ladle linings identified their significant advantages in terms of thermomechanical properties, corrosion resistance and slag resistance. A particular feature of these castables is the synthesis of «in situ» magnesium aluminate spinel at high operating temperatures, which provides increased operational lifetime of the lining.

The microsilica influence on the phase constitution of the composite mixture, containing calcium aluminate cement and spinel-forming reagents – calcined alumina and sintered periclase after firing at 1700 °C was investigated in the paper. It was found that as a result of the interaction of cement calcium aluminates with microsilica, fusible compounds – anorthite and helenite that, at increased microsilica content, impair physical and technical properties of the composite are formed. It was determined that the ratio of spinel-forming reagents and content of the silica-containing material in a matrix component of alumina-magnesia castables is a more important factor of the synthesis of high-melting-point crystalline phases than the microsilica content. Directed regulation of the phase composition of the matrix component of alumina-magnesia castables by adjusting the grain-size composition of spinel-forming reagents and their optimal ratio will ensure achieving a set of the given physical and technical characteristics of concrete and increasing the operational lifetime of monolithic ladle linings.

**Keywords:** alumina-magnesia castable, microsilica, spinel-forming reagents, phase constitution, fusible compounds.

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A STUDY OF THE EFFECT OF IRON (III) COMPOUNDS ON OXIDATION OF IRON (II) IONS BY ATMOSPHERIC OXYGEN

Victor Yavorskiy, Yoroslav Kalyon, Olga Rubay

Deferrisation of groundwater has been performed by many methods whose choice depends on the form in which iron (Fe) compounds exist in water and on its chemical composition. A number of published studies have proved that the iron (III) compounds/sediment used in the filtering substrate has a catalytic effect on the oxidation process. The same property of iron (III) compounds/sediments observed in the sediment resulting from contact purification of water. However, in the case of filtering, due to the large-size granules of the filter substrate, the specific surface area of the autocatalytic layer is small, which significantly reduces the system performance. In the schemes of contact filtering with held-up sediment, the area of the phases’ contact increases, but there is a need for strict observation of the speed of the water flow and an extended contact time (45 min.). Therefore, our tasks were to increase the active contact area of the catalyst pellet of the iron (III) sediment and to reduce the time of the contact between water and the held-up sediment.

Deferrisation was carried out in a horizontal absorber bucket of dispersants, in which the dispersed phase is 0.02 and 0.05 mol Fe²⁺/m³. The time of the contact between the purified water and the compounds of the sediment was 15 to 80 sec, depending on the pH of the water and the dose of the applied iron (III) compounds.

The obtained results can serve as a basis for the development of a resource and energy saving technology of groundwater deferring with recirculation of the newly formed sediment.

Keywords: autocatalytic process, deferrisation, iron (III) compounds/sediment, oxidation by atmospheric oxygen.

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DEVELOPMENT OF METHOD OF USE OF ACID-RESISTANT SELECTIVE ACTION ENZYME PREPARATIONS (p. 38-44)

Petro Shiyan, Tatiana Mudrak, Anatoliy Kuts, Iaroslav Boiarchuk

A lot of studies were conducted nowadays in distilling industry on biocatalysis and fermentation of wort from starch-containing raw material using selective action enzyme complexes, but operational parameters for hydrolization of starch-containing raw material biopolymers are not sufficiently investigated at low pH of the substrate. On the market of enzyme preparations in Ukraine there are acid-resistant enzymes that enable hydrolization of grain mashes in low pH environment. This article concentrates on determination of efficiency of use of acid-resistant enzyme preparations (EP) when producing worts from starch-containing raw material. The results of studies in content in wort of water-soluble carbohydrates and insoluble starch depending on pH, temperature of termofermentive processing (TFP) and enzyme activity stabilizer Ca2+ ions are demonstrated. In terms of bioconversion efficiency of raw grain material components and assurance of microbiological purity of intermediate products of alcohol production, optimum pH is 3.8–4.0, mash processing time is 90 minutes.

Keywords: mash, enzyme preparations, fermentation of wort, wort, water-soluble carbohydrates, insoluble starch, concentration.

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INVESTIGATION OF INTERACTION OF AMINOETHYLETHYLENEDIAMINE WITH SUNFLOWER OIL (p. 44-49)

Anatoliy Melnik, Olga Chumak, Serhii Malik, Alisher Khusanov

The interaction reaction of sunflower oil with hydroxethyl-ethylenediamine at molar ratios of reactants of from 1:1 to 1:3, and
Abstract and References. Технологии органических и неорганических веществ

temperatures of 393–433 K by changes in the amine concentration over time was investigated, based on which the rate constants, activation energy and entropy were calculated. Using a kinetic first-order reaction model, the estimated thermodynamic parameters, changes in the amine concentration over time were calculated and compared with the experimental values. Analysis of variance between concentrations indicates that the amine concentration can be used for the sunflower oil amidation reaction control only at the initial stage. This is caused by the fact that both nitrogen and oxygen-containing products that also react with amine are formed in the oil amidation.

**Keywords**: sunflower oil, amidation, hydroxyethyl ethylenediamine, composition, kinetics, model, adequacy.

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**RECOVERING OF FATTY ACIDS FROM SOAP STOCK USING CARBON DIOXIDE (p. 50-53)**

Svitlana Molchenko, Igor Demidov

Since the domestic oil and fat industry is characterized by a steady production growth, the amount of waste is constantly increasing, which adversely affects the ecological situation in Ukraine. In particular, these products include soap stock – waste of alkaline refining of vegetable oils, which is a source of fatty acids. Fatty acids are a commodity product, the demand and the cost of which is much higher in the soap stock.

The method of recovering fatty acids from the soap stock by carbon dioxide decomposition of their soaps was proposed. The effect of temperature, pressure of carbon dioxide and concentration of the aqueous solution of soap on the decomposition depth was experimentally proved in the paper. Studies have shown that the decomposition process of potassium salts of fatty acids by carbonate acid proceeds at a depth of over 90%. The resulting fatty acids are well suited for use in many industries. Rational technological parameters were determined, and the approximation model of the process was obtained. It was found that after the decomposition of potassium salts of fatty acids by carbonate acid, fatty acid composition of resulting fatty acids, which was determined by gas-liquid chromatography, changes slightly.

**Keywords**: vegetable oils, soap stock, waste, fatty acids, carbon dioxide, decomposition.

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**STUDY OF EMULSIFIER NATURE EFFECT ON THE PROCESS OF HYDROCARBON FRACTION COOLIGOMERIZATION IN THE EMULSION**

(p. 34-57)

Ulyana Fuch, Bogdan Dzynyk, Roman Subtelny

The process of emulsifier coooligomerization of C8 fraction unsaturated hydrocarbons of coooligomers production (synthetic low-molecular petroleum resins), which are obtained from cheap petro-chemical raw materials – hydrocarbon fractions of liquid pyrolysis products (LPP) or cracking of oil, refined products and gas was investigated in the paper.

Since the emulsifier and initiator nature, as well as the emulsification process have the greatest effect on the coooligomerization process in the emulsion, the research is aimed at studying the influence of the main factors – the nature and concentration of emulsifiers and...
The antimicrobial activity of the developed experimental forms of antiseptic preparations relatively commonly infectious agents was investigated. The complex action of the antiseptic solution from Streptomycesalbus UN 44, caused by the activity of bacteriolysins and antibiotic of the strain, defining a wide range of antimicrobial activity was shown. The maximum ability of such an antiseptic to destroy and inhibit the growth of microorganisms is determined in relation to the Gram-positive bacteria of the genera Corynebacte-
ricium, Bacillus, Streptococcus, Staphylococcus.

The ability of the strain Streptomycesalbus UN 44 to accu-
mulate an antibiotic in the cell and to secrete it exogenously was revealed. The leading fungistic antibiotic activity in the finished forms of dry producer biomass and complex liquid antiseptic, the combination of substances with different mechanisms of antimicro-
bial action in the complex preparation was shown.

Finished forms of antiseptic preparations (solution, extract, dry
biomass) for use in veterinary, medicine, canning were proposed.

**Keywords:** Streptomycesalbus, bacteriolysins, antibiotic, fin-
ished forms, antimicrobial activity, antiseptics.

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