

A NEW METHOD FOR WATER CLARIFICATION USING FILTRATION (p. 3-6)

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The paper gives the results of studying the effectiveness of a new method of phase separation using materials with capillary properties. It was found that processing of bentonite suspension by its conventional passing through a paper filter is accompanied by a low average filtering velocity and short operation time caused by intensive clogging of pores by highly disperse particles. As a result, despite the relatively high efficiency of phase separation (residual content of bentonite particles in the filtrate - about 0.3 mg/dm³), the overall efficiency of separation is quite low because of the need for periodic restoration of filtering capacity of porous medium. A new method of phase separation, using materials with capillary properties, allows creating simple, cheap and effective devices for separating liquid and solid phases. Determining factors of separation process and their influence on the intensity of fluid motion in the porous medium were defined, comparative assessment of effectiveness of the proposed method with conventional filtration was conducted, basic parameters of separation with bentonite suspension processing were determined. It was also found that using the new method, the average velocity of fluid motion is twice higher than that of similar methods for conventional filtration.

Keywords: clarification, filtration, bentonite, materials with capillary properties, residual concentrations.

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TECHNOLOGY OF NEUTRALIZATION OF SUMP AT MUNICIPAL SOLID WASTE LANDFILL (p. 7-11)

Valeriia Mychailenko, Alexey Kapustin

The paper deals with studying the process of neutralization of contaminated filtrate, accumulated in a sump at municipal solid waste landfill. The main polluting components are phenols and ferrous ions. The proposed neutralization method consists of four stages and involves alignment of the sump bottom, filling the neutralizing layer, filling the absorbent layer, filling the pressing layer. In the process of water purification, its components are under control. Calcium oxide and slag are used as neutralizing mixture, and layered double hydroxides - as sorbent. The mixture is put alternatively, 1 cm of mixture by 1 cm of slag. For implementation of the neutralization method and precipitation of required amount of iron, 86.8 tons of calcium oxide and 347.1 tons of slag are needed. The total amount of layered double hydroxides, required for complete adsorption of phenols, constitutes 70 tons.

Keywords: filtrate, neutralization, decontamination, municipal solid waste landfill.

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MODERN PROCESSES OF WASTE FORMATION AND ASPECTS OF THEIR MINIMIZING (p. 12-16)

Sergey Morozov, Andrey Morozov

The paper analyzes modern waste generation processes, which require systematization aimed at their minimization at the early stage of developing the new technological processes and improving the efficiency of waste disposal. To solve these problems it is necessary to focus on the ratio of technological parameters associated with waste generation, and to explore their cause-effect relations. Metal, glass, plastic, paper and cardboard are the most commonly used among the variety of recycled materials. Metal and glass can be recycled numerous times, while plastic, paper and cardboard - only two or three times, because they lose their essential properties and their structure changes greatly. There is a so-called expediency threshold, a break-even-point - the point at which profits from using raw material is equal to the difference between the costs on recycling and waste disposal. In case of exceeding this figure recycling becomes inexpedient and its technical limits will be conditioned by different reasons. The purpose of this review paper is selecting the forecasting criteria, allowing waste minimization in modern technological processes of metal working and increasing the ecological compatibility of printed products.

Keywords: waste generation, metal shavings, recycling, disposal, life cycle of waste, minimization.

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ALGORITHM OF DEVELOPING PREVENTIVE MEASURES ON LABOUR PROTECTION AT THE STATE LEVEL (p. 16-19)

Kostiantyn Tkachuk, Mykola Repin

Researches have shown that current state of labour protection in Ukraine requires developing new conceptual approaches to problem solving, in particular at the stage of developing measures aimed at preventing accidents and occupational diseases at the workplace. Taking into account the International Labour Organization recommendations on the need for applying a systematic approach to preventive measures planning, summarizing the existing scientific approaches and methods for systems analysis in strategic planning, it has been proposed to use this experience in the field of labour protection.

An algorithm of developing preventive measures on labour protection at the state level has been described in the paper, based on the use of methods for statistical quantitative analysis, qualitative analysis, PEST and SWOT-analyses, economic analysis, correlation analysis, strategic planning, hierarchy analysis, alternative analysis, decision theory, expert methods, "tree of objectives" method and predictive methods.

The developed algorithm of planning preventive measures on labour protection at the state level using the proposed methodological support of this process allows realization of all basic planning procedures and obtaining necessary measures on creating safe and healthy working conditions at the workplace.

Keywords: developing, preventive measures, labour protection, systems analysis, strategic planning.

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ANALYSIS OF REGULATORY SUPPORT FOR ENVIRONMENTAL MONITORING AT THE INTERNATIONAL, EUROPEAN AND NATIONAL LEVELS (p. 20-25)

Anna Kiporenko

The complexity of natural-technogenic systems as objects of environmental monitoring and monitoring the impact on the environment caused a need for analyzing the structure of its regulatory support at the national, European and international levels with the purpose of determining the degree of harmonization and uniformity of standards. For conducting comparative analysis, the scheme of environmental monitoring control system is given and scheme elements are outlined, which are of interest in terms of their regulatory support. The paper gives analysis of regulatory support at the national, European and international levels on the example of standards which provide the stages of monitoring the quality of drinking water. Conclusions on the heterogeneity and non-uniformity of regulatory support and harmonization of national, European and international standards were made. The research results will form the basis for developing the concept of standards evaluation by their content and recommendations for standards harmonization.

Keywords: environmental monitoring, regulatory support, international, European and national standards.

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INFLUENCE OF ULTRASOUND MODIFICATION OF RHEOLOGICAL PROPERTIES OF POLYSACCHARIDE SOLUTIONS IN CAPSULAR PRODUCTS TECHNOLOGY (p. 26-29)

Alexsandr Nagornij, Olga Neklesa, Yevgen Pyvovarov

Today, there is a great need to develop gel-like food systems, gelation of which creates forms of capsules in which gels, forming the capsule wall, by their structure are characterized as homogeneous gel-like systems, incapable of significant phase separation with distinct syneresis.

The use of ionic polysaccharides is promising, since during their dissolution at certain concentrations macromolecular solutions are formed,

which allow the synthesis of homogeneous gel-like systems. Conditions of technological process of capsule production require increased concentration of polysaccharide in the system, but at the same time it prevents production of capsules of regular geometrical shape as increased concentration leads to increased viscosity of the system.

The paper proposes the proactive ultrasound modification of sodium carboxymethyl cellulose solutions, which eliminates these drawbacks. The influence of physical modification was studied, in particular, the impact of ultrasonic energy, plunger and rotary-pulse devices on structural and mechanical properties of sodium carboxymethyl cellulose solutions. The dependence of viscosity on polysaccharide solution concentration was determined. It was established experimentally that increasing the solution temperature does not affect the intensity of polymer destruction.

Keywords: capsulation, physical-chemical modification, viscosity, polymer, sodium carboxymethyl cellulose (NaCMC), destruction.

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EFFECT OF PRIOR TECHNOLOGICAL TREATMENT ON THE PROCESS OF VEGETABLE SEMI-FINISHED PRODUCT FREEZING (p. 29-33)

Andrey Odarchenko

As a result of poor preservation of fresh fruits and vegetables caused by changes in growing conditions, mechanization of collection processes and product policy, one of the ways of reducing crop losses is its freezing. Hence, the effect of low temperature and technological treatment before freezing on the quality of vegetable semi-finished products for first and second courses based on red beet was studied. Stewing and partial dehydration (slight drying) in different modes were used as technological processing methods.

The cooling rate at low temperatures can be controlled by changing the thermophysical properties of investigated sample during its technological processing before freezing.

It was experimentally established that the temperature of frozen water crystallization in the investigated samples of red beet is in direct dependence on the freezing temperature and prior technological processing of the product.

The starting and final points of frozen water crystallization and melting processes in the samples of red beet were experimentally defined and graphically confirmed. Also, its actual quantity was calculated.

Keywords: red beet, stewing, slight drying, freezing rate, frozen water.

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BIOMEDICAL TESTING OF FERMENTED MILK DRINK OF BABY FOOD «BIOLAKT» (p. 34-39)

Pavel Nekrasov, Nataliya Tkachenko, Ansatsiya Avershina

Rational balanced nutrition is one of the key factors of children's harmonious growth and development. Therefore, elaboration and manufacturing of scientifically grounded and clinically tested technologies of producing dairy, including fermented milk, products for specialized baby nutrition, which would be adapted to mother's milk content, with a high level of probiotic, immunomodulatory and hypoallergenic properties, attractive to native dairy enterprises and competitive at the market, is an urgent task. The paper gives the results of biomedical testing of fermented milk drinks of baby food "Biolakt", produced in accordance with the improved technology, comparing to the control sample, on six groups of weanling rats. The "Biolakt" drinks were graded as good-quality drinks, with probiotic, hepatoprotective and hypoallergenic properties, increased assimilability, normalizing intestinal flora that allows considering them as the category of specialized dietetic, in particular, baby food. It was recommended to carry out clinical tests of "Biolakt" drinks, produced with the use of polyunsaturated fatty acids Omega-3, vitamins and/or minerals.

Keywords: fermented milk drink, baby nutrition (food), adaptation, biomedical testing, lactobacilli, bifidobacteria.

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DEGREE OF CHOPPING AND ITS IMPACT ON THE QUALITY OF DRIED AND HALF-SMOKED PRODUCTS (p. 40-42)

Vladyslav Sukhenko, Jury Sukhenko

It is shown that optimization of duration of mince cutting for summer sausages cooking allows shortening the duration of their drying, providing necessary consistence and quality.

During fine chopping of mince, cutting process is carried out at high speeds. It is accompanied by considerable heat emission, changes in water-binding capacity and structural-mechanical properties of the product. These circumstances cause the need for proper experimental determination and calculation of rational duration of chopping. We set the goal and task of studying the kinetics of summer sausage (for example, the sausage "Moscovskaya") drying, depending on the extent (duration) of mince chopping for further intensification of summer sausages drying. Drying kinetics was evaluated by the amount of moisture, removed from the sausage determining the relative value, i.e. amount of moisture removed from 1 kg of product.

The conducted researches confirmed the possibility of optimizing the duration of chopping of mince dispersion medium, in which the organoleptic evaluation of consistence of finished sausage becomes significantly higher in comparison with other samples.

Keywords: chopping, cutter, smoking, moisture, mince, quality, sausage, drying, organoleptics, consistence.

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