ABSTRACTS

FRI- ONLINE-KS(R)-01

CRYSTAL CHEMICAL AND POWDER X-RAY DIFFRACTION STUDY OF CLINOPYROXENES – NATURAL ANALOGUES OF SYNTHETIC PIGMENTS

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Abstract: *Clinopyroxenes collected from volcanic, intrusive, and metasomatic rocks were investigated. Powder X-ray diffraction and electron probe microanalysis (EPMA) were performed to characterize the studied clinopyroxenes. X-ray diffraction data and unit cell parameters determine the pyroxenes as monoclinic, space group C2/c. In the present study, we present the composition of the clinopyroxenes in terms of major and minor elements and characterize the effect of the elements on the crystal structure. The pyroxene group minerals have the general formula* $M2^{2+}M1^{2+}T_2^{4+}O_6$*, where M2 refers to cations in a generally distorted octahedral coordination, M1 to cations in a regular octahedral coordination, and T to tetrahedrally coordinated cations. The T-site is mainly occupied by Si and* $(Si+Al^{3+}+Fe^{3+})$ *in the case of silica undersaturated end members of the group. The M1-site is occupied by Al, Fe, Mg, Cr, Ti, while the M2-site by Ca and Na. According to the crystal chemical formulae (calculated on the basis of six oxygens) the studied pyroxenes belong to three different series: diopside-hedenbergite, diopside-augite, and silica undersaturated Ca-clinopyroxenes with high content of aluminium in the tetrahedral site of the crystal structure. The obtained results are compared with those of synthesized ceramic pigments at different temperatures and the differences in crystal chemistry and powder X-ray patterns are discussed.*

Keywords: *Clinopyroxene, X-ray powder diffraction, EPMA, ceramic pigments.*

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FRI- ONLINE-KS(R)-02

IMPROVING THE EFFICIENCY OF PROCESSES AND EQUIPMENT OF BAKING PRODUCTION

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Abstract: *The Scientific School of Bakery Processes and Equipment, which operates at the National University of Food Technology (Kyiv, Ukraine), has a number of scientific developments that take into account the world's leading trends in the industry and significantly improve product quality, productivity and hygiene requirements. The essence of the proposals concerns the following processes:*

– Use of kneading machines with cam working bodies. This allows to ensure the high quality of the third stage of kneading - plasticization.

– Combination of dough fermentation operations and forming pieces under pressure in one unit. This reduces fermentation time, reduces the number and metal consumption of equipment.

– Combination of baking and drying processes for some varieties of bread products, in particular, rusks and chopsticks. This avoids heat consumption for reheating the products, the amount of equipment.

– Rational use of heat of steam of hygrothermal processing and heat of secondary steam which is formed during baking of bread.

– Vacuum cooling of bread products. This ensures fast cooling of bread before cutting and packing.

– Stream cutting of different types of bread.

– The use of packaging equipment based on integrated technical complexes created on the basis of mechatronic functional modules, each of which is a functionally and structurally independent product with a large number of synergistically interrelated characteristics and parameters.

Each of these proposals is examined by competent experts and substantiated. The total result is an increase in product quality, productivity and safety, ensuring hygienic requirements, reducing the number of equipment and ensuring its versatility.

Keywords: *bread, equioment, kneading, fermentation, forming, recuperation, baking, cooling, cuttinf, packaging.*

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FRI- ONLINE-1-CT(R)-01

SYNTHESIS OF GARNET PIGMENTS AT LOW TEMPERATURE

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Abstract: *Garnet ceramic pigments were synthesized by the method of solid-phase sintering. The starting materials are pure oxides: CaO, SiO2.nH2O. The following elements have been added as chromophores:: V, Fe dnd Cr. For this purpose, the following raw materials were used:: NH4VO3, Fe2O3 and K2Gr2O7. The pigments were synthesized at a final firing temperature of 1000 ° C. The color characteristics of the synthesized ceramic pigments were determined using a color measurement system - CIELab.*

Keywords: *garnet pigments, solid-state sintering, CIELab color measurement*

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FRI- ONLINE-1-CT(R)-02

CROSS-BORDER REGIONS COLLABORATE FOR BLUE GROWTH PART 1. EXPLORATORY MONITORING OF AQUATIC ECOSYSTEMS

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Abstract: *Black Sea, with its water catchment area and coastal ecosystems, could be considered as a natural laboratory of global importance for fundamental science, sustainability policy and blue economy. That is why its protection is a task that can be solved with a long-term program for sustainable consumption of this valuable resource and will be successful if it uses as a basis the existing scientific capacity and knowledge and the created opportunities for research and monitoring of the ecological condition of Black Sea local ecosystems and plans and implements various initiatives related to nature conservation and responsible behavior, involving the local community. Nowadays- in the time of changes and scientific discoveries for the success of this task are especially important also, the development and implementation of innovative projects - to increase the value of the local services, related to the water ecosystems and sustainable use of resources and the development and implementation of common methodologies and approaches in the applied research at nationay and international level.*

Keywords: *Black sea, water ecosystem, environmental monitoring, Blue Growth*

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FRI- ONLINE-1-CT(R)-03

CROSS-BORDER REGIONS COLLABORATE FOR BLUE GROWTH PART 2 – INDICATORS (FACTORS) INFLUENCING THE LIFE CYCLE OF BIOCENOSIS ORGANISMS

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Abstract: *Black Sea, with its water catchment area and coastal ecosystems, could be considered as a laboratory of global importance for fundamental science, sustainability policy and blue economy. The occurring changes in the ecosystems also have an impact on the development of the biocoenotic organisms inhabiting them. The present study examines abiotic factors (indicators) such as: sediment, temperature, salinity, hydrodynamic turbidity and heavy metals, which are essential for the life cycle of biocenosis organisms that affect the shell of the Rapana venosa, Valencienne; Chamelea gallina and Donax trunculus.*

Keywords: *Black sea, Biocenosis organisms, Rapana Venosa, Mussels, Shells*

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DEVELOPMENT OF A NEW TYPE OF ALCOHOLIC ICE CREAM

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Abstract: *The modern range of milk-based ice cream with an alcohol component was analyzed. The choice of alcoholic tincture in the composition of milk ice cream was substantiated. The cryoscopic temperature of the mixtures was determined using a measuring complex, the dynamic viscosity was determined by a Heppler viscometer, the melting resistance was determined by the melting time of the hardened ice cream samples, and the ice cream was whipped by the weight method. The possibility of using tinctures with an alcohol content of 20% as a part of milk ice cream has been scientifically confirmed. The selection of the structure stabilizer and rational modes of maturation of milk-alcohol mixtures were substantiated by the values of the coefficient of dynamic viscosity. According to the cryoscopic temperature of ice cream mixtures, it was found that the production of ice cream with a mass fraction of alcohol up to 3% determines the possibility of using conventional freezing modes to obtain a product of guaranteed quality. A new type of milk ice cream with the use of tinctures can be recommended for the introduction of the classical technological scheme of production with the clarification of maturation modes.*

Key words: tinctures, ice cream, cryoscopic temperature, maturation

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FRI- ONLINE-1-BFT(R)-02

ENERGY PARAMETERS OF THE PROCESS OF ULTRAFINE GRINDING OF MEDICINAL AND COSMETIC COMPONENTS IN A BEAD MILL

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Abstract: *The process of ultrafine grinding of components of medicines and cosmetics in a laboratory bead mill is considered. The purpose of the study is (1) to determine the energy parameters of the process of ultrafine grinding of medicinal and cosmetic components in a bead mill, as well as (2) to determine the dependences of changes in technological parameters. A suspension of castor oil and cosmetic pigment in a ratio of 60% oil and 40% pigment was used as a model body. A series of experiments was carried out, where the degree of grinding was determined using a microscope with a built-in camera and software, the temperature was measured with ds18b20 temperature sensors, the power was measured with a three-phase CNFAJ Intelligent Power Meter. When grinding the pigment "red 120" for a period of time from 0 to 45 minutes, the power decreases, the temperature of the "beads-product" system increases, and the particle size decreases. This process occurs most intensively in the first 5 minutes. Most of the energy is spent on the work, which is spent on mixing the system "beads-product", and the work, that is spent on heating the structural components of the product and the parts of the mill interacting with them, which, in turn, depend on rheological properties of the suspension.*

Keywords: *grinding, beads, mill, energy, suspension.*

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FRI- ONLINE-1-BFT(R)-03

INFLUENCE OF VACUUM COOLING METHOD ON QUALITY INDICES OF BREAD

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Abstract: *The method of vacuum cooling allows to cool the bread quickly, reduce the production area for cooling, to provide sterile process conditions. The influence of cooling modes on the quality of wheat bread was studied.*

The bread was cooled under a vacuum of 4–6 kPa, the rate of pressure reducion varied from 2 to 8 kPa/s. Structural and mechanical properties of bread were determined by the method of penetration.

The critical rate of pressure drop was 4.5 kPa/s, at higher speeds the structure of the bread is destroyed, the crust is separated from the crumb. Bread cooled under vacuum stimulates freshness (elasticity) longer than after the usual, natural method of cooling.

Keywords: *Bread, Cooling, Vacuum, Crumb.*

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FRI- ONLINE-1-BFT(R)-04

LACTOSE INTOLERANCE AND ORAL HEALTH

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Abstract: *Lactose intolerance has various manifestations and symptoms. It can be congenital - alactasia, but it can also be acquired over the years. Approximately 65% of the world's population has this condition since birth. On closer inspection, approximately 70% of East Asian adults are found to be lactose intolerant. The paper reviews the lactose intolerance worldwide, paying particular attention to the available information for Europe. European Dairy Association reported the Hungary, Estonia, Greece and Italy had over 40% frequency of lactase deficiency. There are no enough studies about the problem in Bulgaria. Original results from a questionnaire survey conducted in Bulgaria are presented. The possible connection of the ethnicity of the people with possible lactose intolerance was traced. Facts related to the change in oral health while avoiding the consumption of lactose-containing products (milk and dairy products) are presented and discussed. A group of foods that would be useful for people with lactose intolerance to protect their oral health are presented.*

Keywords: *lactose intolerance, oral health, vitamin D, calcium, milk.*

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FRI- ONLINE-1-BFT(R)-05

SPECTROPHOTOMETRIC ANALYSIS OF RETINOL AND BETA-CAROTENE IN MILK

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Abstract: *Milk is an essential part of the daily foods. Natural milks contain certain amounts of micronutrients such as vitamins and carotenoids. Vitamins are crucial for the proper development of the baby, as well as adolescents and adults. These substances cannot be synthesized de novo in the human body and therefore they provided through food. The concentration of the carotenoids in cow milk is critical point for the implementation of complete nutrition. In this study, spectrophotometric analyzes are persented for retinol (vitamin A) and β-carotene for UHT milk samples. Different mixtures of organic solvents were used and compared. Linear ranges of retinol and β-carotene in standard solutions were obtained by using hexane as solvent. The equations obtained for these curves were used to determine the target substances in real cow milk samples.*

Keywords: *retinol, beta-carotene, carotenoids, spectral analysis, milk, vitamin A.*

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FRI- ONLINE-1-BFT(R)-06

TECHNOLOGICAL ASPECTS IN THE APPLICATION OF EDIBLE COATINGS

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Abstract: *The search for better strategies for preserving food with minimal changes during processing has been of great interest in recent decades. A solution is to apply coatings to minimally processed fresh foods. Most publications and scientific literature comment on the composition and properties of edible coatings. Various aspects are considered, mainly of a functional nature. It should be noted that in most cases it is a question of laboratory experiments and results of the effect of various coatings with additives on the protective function of the coating, its physical, physicochemical, antibacterial and other properties. There is only a small discussion about problems related to the industrial application of edible coatings and especially on the technological aspects of their application on specific food products. The presented material reviews the information from various literature sources about the methods and equipment through which the coatings are applied. An attempt has been made to summarize the main problems and the solutions adopted so far for the industrial application of edible coatings on various food products.*

Keywords: *edible coatings, edible packaging, deposition of edible coating, coating formation*.

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SAT-ONLINE-P-2-CT(R)-01

POSSIBILITY FOR USE OF OLD DRUGS IN THE THERAPY OF NEW DISEASES

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Abstract: *In the context of a global pandemic, it is important for the medical and pharmaceutical community to find effective drugs for socially significant diseases, which in turn is connected with the possibility of their rapid release on the market. However, the development of new drugs involves a lengthy process. The entire process – from concept through preclinical testing in the laboratory to clinical trial development, including Phase I–III trials – to the approved drug typically takes more than a decade. This enables medical professionals to use already known drugs in the treatment of new or rare diseases for which no conventional treatment has been established. The repurposing drugs have a number of advantages and represent a promising direction in the treatment of a number of diseases.*

Keywords: *pandemic, development of new drugs, repurposing drugs, rare diseases.*

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SAT-ONLINE-P-2-CT(R)-02

IN SILICO PREDICTING METABOLIC ACTIVATION OF METRONIDAZOLE IN LIVER

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Abstract: *Metronidazole is an antimicrobial drug with wide spectrum of activity. The aim of this work is to predict the probable metabolic activation of metronidazole in the liver (in vivo and in vitro rat) and to determine the protein and DNA binding of its metabolites by OECD QSAR Toolbox. The parent structure of metronidazole can bind to DNA (Radical mechanism via ROS formation and S_N1 mechanism of action) but it cannot bind to protein and experimental metabolic pathways of action were not observed for rat in vivo and in vitro. The generated metabolites after hepatic metabolic activation simulator for both conditions (in vivo and in vitro rat) are nine and seven, respectively. The reactive metabolites for both (in vivo and in vitro) have different mechanisms of action (Radical mechanism via ROS formation, S_N1, $A_N2$and S_N2) by DNA binding. Some reactive metabolites are with the following mechanism of action (Schiff base formation) by protein binding.*

Keywords: *metronidazole, prediction, metabolism, liver, OECD QSAR Toolbox*

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SAT-ONLINE-P-2-CT(R)-03

COMPARATIVE ANALYSIS OF BIODIESEL PRODUCTION TECHNOLOGIES USING SUITABLE RAW MATERIALS

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Abstract: *This paper draws attention to the technological feasibility of biodiesel production from various raw materials. It examines both the stages of pre-processing of raw materials as well as the possibilities for transesterification and the combination of individual technologies for obtaining quality biodiesel in an environmentally friendly way. Conclusions for optimal selection of raw materials and technologies are made on the grounds of analysis and comparison.*

Keywords: *Biodiesel, Biomass, Transesterification*

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SAT-ONLINE-P-2-CT(R)-04

BIOACTIVE GLASS CRYSTALLINE MATERIALS OBTAINED BY SOL-GEL METHOD

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Abstract: *The article is devoted to the establishment of the method of obtaining glasses of a given chemical composition in the system Na_2O - CaO - SiO_2 - P_2O_5, which involves the use of sol-gel method. The method involves the use of the following raw materials: ethyl silicate $(C_2H_5O)_4Si$ as a source of gelation, phosphoric acid H_3PO_4 and soluble salts of $Ca(NO_3)_2$ and $NaNO_3$. The synthesis of the material takes place with constant stirring during gelation and subsequent calcination at a temperature of at least 600°C. This technology involves reducing energy consumption for production and improving the basic characteristics of the glassy material. The glasses obtained by this technology can be used in the production of bioactive glass crystalline materials.*

Keywords: *Sol-gel method, Ethyl silicate, Bioactive glass, Calcination, Glass crystalline materials*

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SAT-ONLINE-P-2-CT(R)-05

STUDY OF DIOPSIDE CERAMIC PIGMENTS WITH RARE EARTH ELEMENTS

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Abstract: *Diopside ceramic pigments with basic dipside phase $MgCaSi_2O_6$ were synthesized by solid phase sintering with pure raw materials: $CaCO_3$, MgO, $SiO_2.nH_2O$, Pr_6O_{11} and Er_2O_3. The pigments were synthesized at three final firing temperatures: 1000, 1100 and 1200 ° C. The resulting ceramic pigments were examined by powder X-ray diffraction, infrared spectroscopy, electron microscopy, electron paramagnetic resonance. The color characteristics were measured spectrophotometrically using a color measurement system - CIELab. The best pigments are applied in white cover glaze for faience.*

Key words: *diopside pigments, solid-state sintering, CIELab color measurement*

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SAT-ONLINE-P-2-CT(R)-06

EFFECT OF TEMPERATURE ON THE KINETICS OF OLEIC ACID ESTERIFICATION PROCESS WITH TRIMETHYLOL PROPANE (TMP)

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Abstract: *The present study investigates the kinetics of esterification of oleic acid with trimethylol propane at different process temperatures. 1% p-TSA was used as catalyst. The process was carried out under vacuum and the reaction rate was monitored by analyzing the acid number of the mixture. The reaction was studied at following temperatures: 90, 105, 120 and 150 ° C, and the duration time was 1200 min. There was noticed significantly higher speed of the process at temperature of 150 °C in comparison with the other studied reaction temperature. However, final acid values recorded at 120 ° C and 150 ° C and time duration of 1200 min are close, i.e. 2.71 and 2.5mgKOH/g, but they are significantly lower than acid values observed at 90 ° C and 105 ° C, which are 5.66 and 4.35 mgKOH / g, respectively*

Keywords: *Trimethylol propane, Biodegradable lubricants, Oleic acid, Esterification, p-TSA*

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SAT-ONLINE-P-2-CT(R)-07

CONTINUOUS CONSTANT VOLTAGE ANODIZING OF ALUMINUM

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Abstract: *The kinetics of continuous constant voltage (U_V = const) anodizing of aluminum (AA1050) in an electrolyte, with no dissolving action (aqueous borate electrolyte) on the formed anodic alumina was studied in the present work. The recorded $J_{total}(t)$-dependencies are interpreted on the basis of the notion that the total current (J_{total}) flowing in the Al/Al_2O_3/Electrolyte system includes an ionic (J_i) and an electronic (J_e) component, i.e.: $J_{total} = J_i + J_e$. The dependences of these two components on the electric field strength (E) and temperature (T) are discussed considering existing theoretical concepts. The analysis of the kinetics undoubtedly shows that the presence of an electronic component in the total current flowing under conditions of continuous constant voltage anodizing in the (+)/Valve metal/Anodic oxide/Electrolyte systems should not be neglected.*

Keywords: *barrier anodic Al_2O_3 film, constant voltage anodization, ionic and electronic current component*

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SAT-ONLINE-P-2-CT(R)-08

SINGLE-FACTOR ANALYSIS ON THE KINETICS OF OLEIC ACID ESTERIFICATION PROCESS WITH TRIMETHYLOL PROPANE (TMP) AT DIFFERENT AMOUNTS OF P-TSA AS CATALYST

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Abstract: *The present study investigate the kinetics of esterification of oleic acid with trimethylol propane at different amount of catalyst: 0,5, 1% and 5%. p-TSA was used as catalyst and was compared to kinetic of process without catalyst. The process is carried out under vacuum, reaction temperature 120 ° C and the time duration of 1200 min. Best results and significantly higher reaction rate of the process were recorded at 5% p-TSA mgKOH/g respectively, but we observed high darkness of the mixture and have some problems with washing of the mixture probably due to increasing of emulsification properties of reaction mixture at higher amounts of catalyst.*

Keywords: *Trimethylol propane, Biodegradable lubricants, Oleic acid, Esterification, p-TSA*

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SAT-ONLINE-P-2-CT(R)-09

SYNTHESIS OF 6-NITRO- AND 6-AMINO- DERIVATIVES OF 2-(2,4-DIOXO-1,3-DIAZASPIRO[4.5]DECAN-3-YL)-1*H*-BENZO[*de*]ISOQUINOLINE-1,3(2*H*)-DIONE

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Abstract: *This article describes the synthesis of 6-nitro- and 6-amino- derivatives of 2-(2,4-dioxo-1,3-diazaspiro[4.5]decan-3-yl)-1H-benzo[de]isoquinoline-1,3(2H)-dione. The structures of the obtained compounds were proved by physicochemical parameters, elemental analysis, IR, ^{1}H and ^{13}C NMR spectral data. The antimicrobial activity of the synthesized compounds against various microorganisms was studied.*
Keywords: 1,3-phenalenediones, isoquinolines, spirohydantoins, antimicrobial activity

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SAT-ONLINE-P-2-BFT(R)-01

LEAN-PRODUCTION: PRINCIPLES AND TOOLS

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Abstract: *To reach a new level of development, the food industry definitely needs new technologies, technical solutions for the development of which are directed to many investments coming into the industry.*

The food industry needs to change, and the tools available to make it successful are LEANs, which are relatively easy to use and effective. This can increase the value of products, help solve the problem of supply-demand, develop followers and improve performance.

Lean production involves the involvement of each employee in the optimization process and maximum customer focus. According to the concept of lean production, all activities of the enterprise are divided into operations and processes that add value to the consumer, and operations and processes that do not add value to the consumer. The task of "lean production" is the systematic reduction of processes and operations that do not add value.

Lean production is not done. This is a constant improvement in the little things. With Lean there are no grand innovations, only continuous improvement in small steps.

Keywords: *Lean, Production, Development, Food, Industry.*

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SAT-ONLINE-P-2-BFT(R)-02

DEVELOPMENT OF CHEESE FILLING TECHNOLOGY FOR MEAT INDUSTRY, IN CONDITIONS OF DEFICIENCY OF DAIRY RAW MATERIALS

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Abstract*. The issues of development of cheese products technology for further use as a part of sausage products are covered in the work. Model samples of cheese products based on protein concentrates using a stabilization system, dyes and flavoring mixtures. The main organoleptic and physical-technological indicators of the developed products are investigated. The hardware-technological scheme of production is developed, taking into account the minimum production areas and additional equipment of equipment, for direct production of this product at the meat-processing enterprises. The use of the developed mixture for the production of cheese products will allow to produce a wide range of products in regions with a shortage of traditional raw materials. The production of cheese products on the basis of protein concentrates makes it possible, at the initial level, to control the content of milk protein in the finished product.*

Key words: *cheese, cheese product, milk, protein concentrates.*

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SAT-ONLINE-P-2-BFT(R)-03

ADVANCED TECHNICAL SOLUTIONS FOR YEAST DOUGH KNEADIND

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Abstract: *In the bakery industry, the most labor-intensive production have special varieties of bread products: bakery and rusks, bread sticks and others. This is due to the more complex technological scheme of production and the insufficient level of its mechanization. Different types of machines are used for kneading yeast dough, which, depending on the type of flour, recipe composition and features of the range, have different mechanical effects on the dough. To obtain a high quality dough, it is necessary to apply the kneading process taking into account the specifics of the mode and the optimal process parameters: kneading intensity, the influence of the rotational speed of the working element and the duration of kneading. In the production of bakery products there are trends in the use of accelerated dough technology, which leads to the intensification of the process of kneading the dough and the development of continuous kneading machines to ensure continuous flow production.*

In the food industry, it is advisable to develop and implement new technologies, constructive working element, increase productivity and improve the quality of finished products. The use of machines of uniform-flow action with highly productive working element will allow to mechanize and automate production processes, to exclude the use of human labor, to reduce energy consumption, to ensure high quality of finished products.

Keywords: Bakery, Industry Kneading, Dough, Technical, Cam.

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SAT-ONLINE-P-2-BFT(R)-04

USE OF ALTERNATIVE SWEETENERS IN ICE CREAM

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Abstract: *The article is devoted to research aimed at improving the technology of ice cream through the use of sugar substitutes and their compositions that exhibit functional and technological properties and improve the quality of the finished product. The feasibility of using starch syrup and polyols for the formation of recommended organoleptic, physical and chemical characteristics of ice cream, and their stabilization during the guaranteed period of storage is scientifically substantiated. The main criteria for the choice of sugar substitutes in the composition of different types of ice cream are selected such characteristics as the degree of sweetness, cryoprotective and structural ability. The article describes the results of analytical and experimental research methods: rheological characteristics and cryoscopic temperature of mixtures, organoleptic characteristics of ice cream, whipped cream, resistance to melting. According to the same criteria, the expediency of complete replacement of sucrose in the composition of ice cream with erythritol and its composition with glucose syrup in the ratio of 90:10 to 50:50 was confirmed. The conclusion about the possibility of purposeful technological effect in the cycle of ice cream production with erythritol and composite mixtures of starch syrup with different degree of saccharification is formulated.*

Keywords: *Cryoscopic Temperature, Ice Cream, Polyols, Structuring Ability, Sweeteners*

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SAT-ONLINE-P-2-BFT(R)-05

DEVELOPMENT AND MARKETING TRENDS OF FLEXIBLE PACKAGING MATERIALS

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Abstract: *The paper reviews the main aspects of current market status of flexible packaging materials. The properties of the materials are indicated, which determine their advantages in comparison with other packaging materials. The current data of the analysis of the flexible packaging materials market are provided. The main trends in the flexible packaging development are considered, such as: individualization and convenience; optimization (design) of materials and processes; concern for human health and food safety; packaging in a pandemic and after COVID-19; e-commerce and contactless delivery, environmental aspects. The role of flexible packaging in circular economy implementation is defined. Examples of modern flexible packaging designed to meet the requirements of the circular economy are given.*

Keywords: *flexible packaging; polymer; monomaterials; recycling; sustainability; circular economy.*

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SAT-ONLINE-P-2-BFT(R)-06

SIMULATION MODELING OF THE ULTRAFINE GRINDING PROCESS IN A BEAD MILL

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Abstract: *It was conductiong the modelling of the grinding process in a laboratory bead mill with a standard working elements configuration using simulation software. The purpose of the study is to determine the stress-strain state of the structure, the speed of movement of the system "beads-product", pressure and temperature in the working chamber. A suspension of castor oil and cosmetic pigment was used as a model body. The properties of the suspension were previously investigated to determine the rheological properties. When running a simulation in the laboratory bead mill using simulation software, it is clearly seen the areas where mixing, friction and grinding are most effective. In these zones, the contact of the working elements (beads) with the ground product in the suspension is maximum, which is expressed in the release of a large amount of heat.*

Keywords: *grinding, beads, mill, modelling, energy, suspension.*

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SAT-ONLINE-P-2-BFT(R)-07

THE BIOMASS OF CONIFEROUS PLANT SPECIES AS A BIOENERGY RESOURCE – MINI REVIEW

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Abstract: *The usage of biomass from coniferous species is one of the most sustainable methods for using renewable energy sources. Forest wood or biomass from the essential oil industry can be used as an alternative energy source. The conversion of biomass into an energy source includes mainly thermal methods (pyrolysis, gasification, combustion). Coniferous biomass can be transformed into extrudates, pellets, or composite in the form of solid fuels during conversion methods. The application of the techniques of the circular economy through the use of coniferous biomass will contribute to the ecological and socio-economic indicators of Bulgaria. This review may focus on the potential applications of biomass from the logging, wood processing, and essential oil industries, and mainly in the use of coniferous species.*

Keywords: *Bioenergy potential, Coniferous species, Alternative energy resources, Biofuels*

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SAT-ONLINE-P-2-BFT(R)-08

GRAPE SEED ANTIOXIDANTS

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Abstract: *Grapes and related grape derivatives contain various biologically active components useful for human health. A large group of these components are phenolic antioxidants, including anthocyanins, catechins, resveratrol, phenolic acids and procyanidins. Flavonoids make up the majority of phenolic compounds (65-76%) in grapes. Anthocyanins are a major part of flavonoids and are found in high percentages in red grapes. Most of the grape phenolic antioxidants are distributed in the skins and seeds of grapes. The phenolic compounds resveratrol, anthocyanin and catechin are concentrated in the skins, while the procyanidins are concentrated in the grape seeds. The oligomeric and polymeric procyanidins in grape seeds have a wide range of pharmacological and therapeutic properties and are one of the most powerful natural antioxidants. In recent years, these proanthocyanidin compounds have been extracted and purified from grape seeds and are offered as valuable dietary supplements.*

Key words*: antioxidants, red grapes, white grapes, grape seeds*

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SAT-ONLINE-P-2-BFT(R)-09

EFFECT OF CHICKPEA FLOUR ON SOME INDICATORS OF WHEAT CAKE DOUGH AND QUALITY OF PRODUCTS

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Abstract: *The effect of chickpea flour on some indicators of wheat cake dough and the quality of products was studied. It was found that the addition of chickpea flour into wheat make leads to a change in some properties of the dough and the quality of the product. As the quantity of chickpea flour increase, as the dough density increase. After sensory profil, it was found that the samples have a highly intense color of the upper crust. There is the presence of smaller, unevenly distributed pores, the chewability is identical to that of the control sample. After all the tests, it was found that it is possible to replace wheat flour with up to 20% chickpea flour.*

Keywords: *Chickpea flour, products quality, sensory analysis*

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SAT-ONLINE-P-2-BFT(R)-10

GRAPE ANTIOXIDANTS IN MEAT AND MEAT PRODUCTS

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Abstract: *Lipid oxidation is one of the biggest important problems that reduce the shelf life of meat and meat products. Delaying the oxidation of lipids and development of unpleasant odors, as well as improving color stability is done with the help of antioxidants. Antioxidants are divided into two groups - natural and synthetic. Synthetic antioxidants intake leads to cancer and acute toxicity. Therefore, in recent years, the food industry prefers natural to synthetic antioxidants. This review presents current trends in the use of antioxidants from grape extracts to inhibit lipid oxidation of meat and meat products. The results show that grape seed contains effective antioxidants for use in meat and meat products and those natural antioxidants can completely replace synthetic ones.*

Keywords: *lipid oxidation, meat, meat products, antioxidants, grape seed*

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SAT-ONLINE-P-2-BFT(R)-11

STUDY OF THE MAGNESIUM CONTENT IN GLUTEN-FREE TYPES OF FLOUR

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Abstract: *Nowadays, many of people pay attention to healthy eating and consumption of food products rich in biologically active substances. Such products help prevent the deficiency of various macro- and microelements caused by malnutrition. This aroused our interest in studying the magnesium content of gluten-free types of flour: from quinoa, amaranth, buckwheat, carob and chickpeas. The results reveal that the magnesium content of gluten-free flours varies from 594,00 mg/kg (carob flour) to 1915,00 mg/kg (amaranth flour) and is higher than that found in wheat flour type 500 – 130,75 mg/kg. The determination of magnesium content is performed by using highly sensitive AES-ICP method.*

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SAT-ONLINE-P-2-BFT(R)-12

PRODUCING BIOGAS BY APPLIYNG ELECTRICAL CHARGE

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Abstract: *The paper reviews the methods of applying electrical charge to manure, which is important part of the anaerobic fermentation, in order to produce biogas. During the experiments, different voltages are applied to the manure. The aim is to investigate the influence of the electrical charge with manure. It's believed that the electric charge improves the process of anaerobic digestion and results in higher yield of biogas with higher methane content. The experiment consists of two main parts: part one is the plant material, which is treated with acid and part two which is the manure treated with electric charge. After the two materials are treated, they are mixed and placed in glass bottles, which are hermetically closed and attached to biogas collectors. Then the bottles are placed in a water bath at 35 ° C. Samples were taken daily for analysis.*

Keywords: Biogas, plant material, electric charge, methane content

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SAT-ONLINE-P-2-BFT(R)-13

MICROBIOLOGICAL EVALUATION OF READY-TO-EAT SUNFLOWER SEEDS

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Abstract: *The subject of this report is a microbiological evaluation of four batches of ready-to-eat sunflower seeds. The total number of microorganisms, the presence of coliforms, Staphylococcus aureus and Salmonella were found. The obtained results were compared with the regulatory requirements for the product and it was found that the four batches of sunflower seeds meet the requirements.*

Keywords: *Sunflower seeds, Microbiological contamination, Coliforms, Staphylococcus aureus, Salmonella*

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