Materials of Conferences

RESEARCH ZYMOHYDROLYSIS ALBUMENS OF MILK

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Proteinaceous hydrolyzates are the products of the proteolysis consisting of separate amino acids, their sodium salts and the polypeptide remains. Proteinaceous hydrolyzates actively use for production of specialized products of a baby and sports food. Proteinaceous hydrolyzates are a full-fledged product of a parenteral food at the various conditions, being accompanied proteinaceous insufficiency, reduce also intoxication phenomena. In the course of hydrolysis of proteins there is a rupture of peptide communications of a proteinaceous molecule to formation of Dee – and трипептидов, and also free amino acids that increases digestion of albumens in a live organism. In this regard use of proteinaceous hydrolyzates in production of food in a diet a food, in particular, children is used by proteinaceous hydrolyzates with lack of amino acids in the form of making components of medical foods which allow to optimize biological value and to provide additional functionality to an organism of children of early age [1].

For creation of proteinaceous hydrolyzates as the main component of products of a special purpose, for patients with a gistidinemiya, it is necessary to decide on a type of hydrolysis, the rational parameters of hydrolysis providing the maximum extraction of a histidine from proteinaceous molecules for the subsequent biotransformation of a histidine in connections, not having toxic effect on an organism of the patient [2].

Two ways of hydrolysis of proteinaceous molecules are known and are widely used: chemical (acid and alkaline) and fermentativny [3].

As a result of research of technological process of purposeful removal of a histidine from a polypeptide chain of a dairy proteinaceous concentrate by means of fermentativny hydrolysis by the enzimatichesky system, consisting from ekzo-and эндопептидаз, received: quality эндопептидазы used chymotrypsin (KF 3.4.21.1) which possesses wider substratny specificity unlike other enzymes and mainly splits peptide communications, and also hydrolyzes communications of a leucine, methionine, but it is especially important that this fermental preparation allows to destroy a histidine. Chymotrypsin is most active in the range up to 8,2 at a temperature of 50 ± 1 °C. In quality экзопептидаз used карбоксипептидазу And and аминопептидазы. Karboksipeptidaza A. The analysis of results of research, showed that at a ratio «enzyme substratum» 1:40 at 6–8 hours of hydrolysis is formed about 2,0 mg/100 г a free histidine, and at the same duration of reaction, but at a ratio complex 1:20 enzyme-substratnogo the mass fraction of a histidine reaches more than 2,20 mg/100 г protein. At duration of hydrolysis of a mix of proteins of cow milk 24 hours are celebrated the greatest extent of extraction of a histidine from a polypeptide chain. So at a ratio «enzyme substratum» 1:40 this value reaches 2,69 mg/100 г protein that is 1,2 times higher, than at the same enzyme-substratnom a ratio, but duration at 8 ± 0,05 hours. At a ratio «enzyme substratum» 1:20 and duration of 24 ± 0,05 hour is observed the greatest extent of extraction of a histidine to 100 %.

At enzyme-substratnom a ratio of 1:40 and 1:80 lasting hydrolysis up to 4 ± 0,02 and 8 ± 0,02 hours, low release practically all amino acids that is not rational use of the ratios given enzyme-substratnykh, in connection with increasing costs of use of these enzymes also is observed.

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ANALYSIS AND STABILITY ENSURING OF ELECTRONIC STRUCTURES TO THERMAL INFLUENCES (ASONIKA-T)

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Purpose and main features of the subsystem ASONIKA-T. Subsystem ASONIKA-T can operate in standalone mode or as part of ASONIKA in combination with other subsystems. Subsystem ASONIKA-T is designed to automate the modeling of thermal processes such as micro assemblies, radiators, heat-removing bases, hybrid-integrated modules, power cordwood structure, cabinets, racks, and atypical (arbitrary) structures electronics.

You can use the machine for the analysis of thermal processes the following types of model structures: plate unit housing, modular design, cluster design.

The subsystem, during the design of electronic structures, allows to implement the following design objectives:

– to identify the average temperatures of blocks, printed circuit assemblies and materials bearing structures, as well as the air volume inside the electronic structures;

– to make changes to the electronic structure in order to achieve acceptable thermal conditions;

– to choose the best option in terms of structural thermal work regimes from several existing conceptual options;

– to justify the need and the evaluate the efficiency of additional electronic protection from thermal influences;

– to create, if necessary, an effective program for testing electronic models and prototypes on the thermal effects (in thechoosing problems of the most information tested influences, the choice of sensors and their installation location in the most heat-loaded places, etc.).

The subsystem allows you to simulate the stationary and non-stationary thermal modes of electronics. There is the possibility of taking into account the causes of non-stationary thermal conditions: a change in time of ambient temperature, time variation of the heat capacity of electronic components, the time variation of the heat capacity of structural elements, etc.

There is a possibility of integrating the work of electronics in different conditions: in vacuum and in air, both at normal and at reduced pressure. It is possible to account for different cooling conditions: natural or forced convection, heat, air cooling, the use of heat sinks, etc.

ASONIKA-T subsystem's service software includes a database with geometric and thermo-physical reference parameters of electronic components and construction materials, graphical input of initial data for structures graphical output of results.

Simulation of thermal processes in electronic structures using ASONIKA-T subsystem. For the simulation session, the following background information is required:

– sketch or drawing of the electronic bearing structure;

– thermo-physical material parameters of the considered design;

– heat generation output in the lower-level hierarchy structures that are within the structure under consideration. Output consist of mounted electronic components in them;

– cooling conditions (boundary conditions) design.

The first stage of constructing a thermal processes model (TPM) of electronics module is that the product is divided into conditional isothermal volumes. Electronic component, an element of product design can be shownin the form of these isothermal volumes, which is necessary to determine the temperature, air volume inside the unit, the environment, a set of elements of the product, the entire electronics unit, element parts, and etc. The partition depends on the structure of the calculated object, on the required accuracy of thecalculation temperature, on the assumptions made when considering the heat transfer processes in the product, and etc. Main difficulty is finding the allocation of points in the product, in which the accuracy of modelinghasbeen savedand at the same the complexity of the TPM (the number of nodes) would remain within reasonable limits. To do this, first idealize (simplify) the processes of heat transfer in the product:

– ignore the minor types of heat transfer in the product design (ie, discard irrelevant thermal connection between the nodes of TPM);

– justify and accept conditional insulated these or those groups of bodies (parts, elements). Conditionally an isothermal volume, including several bodies, called the «hot zone».

Next to build TPM electronic block among these conventional isothermal volumes, volumes that are in thermal interaction are allocated. These include:

– bordering single Solid State volumes (conduction);

– volumes, that interact through layers of air (free convection in a confined space);

– volumes that are in the radioactive heat transfer (radiation);

– volume of the solid and the volume of the surrounding air (convection);

– contact volumes of two solids (contact thermal conductivity), etc.

In the ASONIKA-T subsystem, TPM is represented by a topological TPM, which isrepresented as an undirected graph. Vertices (nodes) of the graph modelingstructure'srelatively insulated elementary volumes (they correspond to structural elements and components of electronics structure, or fragments).The branches (edges) of the graph represent the heat flow between the volumes of relatively insulated structures in TPM.ASONIKA-T subsystem provides the ability to automatically form TPM standard structures, for non-standard structures there is a graphical user interface in which the user builds himself a topological TPM.

ASONIKA-T subsystem has the ability of taking into account the thermal interactions, and hence the possibility of applying the types of the TPM branches.

Based on of the topological TPM, a system of nonlinear algebraic equations (SNAE) is formed for stationary thermal process or a system of ordinary differential equations (SODE) for transient thermal process. To solve systems of equations, the designer sets the boundary conditions which corresponding to the conditions of electronic operation. The backward differentiation formula (BDF) is used to solve SODE, the fixed point iteration method is used to solve SNAE. To solve systems of linear algebraic equations (SLAE), which include SODE and SNAE (at each time step and / or at each iteration of non-linearities), the LU decomposition method is used with the symbolic factorization and also taking into account the matrix sparsity of thermal conductivities.

After the TPM was created, the calculations are carried out.According to the results the user is able to obtain various textual and graphical information. The data is displayed for both stationary calculation in the form of a temperature tables in the model nodes and for the nonstationary calculation in the form of a temperature dependency graph in the model nodes on the time and temperature table in the time intervals in the model nodes.

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THE DRAINAGE LOCAL DRY AREAS WITH GROUND WATERS OVERFLOW IN THE UNDERLYING AQUIFER

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The systems drainage construction method is known, having included the excavation tranches, the pipe – lines and the collector – drainage system laying, the bore pits excavation on the picket well lines, and the wells installation in these wells – water separators, the wells connecting to the collector – drainage network, the filters' implementation around the well, the tranches' and the bore pits' backfilling. At the well – absorbents installing together with the pipe – line laying, between its tee fitting set units, each of which is connected the flexible perforated branch pipe, whose end is brought up to the surface of the soil, the filter column is carried out around it, and the trench is finally covered. Then, on the filter column border the hole is torn, in which the well is set, and, simultaneously, the flexible branch pipe is connected to the well, with the filter creation.

So, the soil draining way with the drainage water reduction is the closest to the technical nature to the proposed technical solution, and, moreover, it has been taken, as the prototype. The shaft wells and the mine shafts construction, the drilling from the bottom of the last opposing horizontal wells, the removal of them. At the same time, during the counter wells drilling, their location end sections at the different levels and the latest equipment by the water intakes are produced, and during the water drainage, the evacuation is carried out counter located below each well, and, at that, the end sections locations are within the limits of their efficient range. Just after the counter wells drilling, the counter – tunneling is carried out over them the additional drainage wells.

The known technical solution drawback is, that the receiving wells are in the same aquifer of the ground (e.g. subsoil and subsurface ones) waters, having based on the impervious layer (e.g. aquiclude).

The new method is aimed at the above – stated disadvantages eliminating of the existing technical solution and, moreover, of its use, can be obtained by a more reliable technical result: the natural water overflow obtaining, through the impervious discontinuity layer, and the water flow from the top to the bottom of the aquifer, the system reliability increasing, and also the works simplification at the installation.

This is, practically, achieved by the fact, that in the process of the draining soil drainage method, having included the wells formation, the ground waters bypass and the removal of them, it, moreover, is proposed to be used, as the common dehumidifying chamber wells, as well as the bore drainage purifying drains, having radiated by the beams into the subsurface and the subsoil filtration zone, where the accumulation of the large amounts of the moisture is, practically, taken its place, having based on the dense layer of the impervious clay. According the filtered beam drains, the water is flowed down into the dehumidifying chamber, from which it is pumped by the pump.

So, the new method efficiency is consisted in the following combination of the essential features, sufficient for the above – mentioned technical result achieving. This is ensured by the fact, that a more improved method of the drainage drying out, which is provided the purifying filtered beam and the radial drainage drying out systems, in which:

– the drainage is occurred, at the expense of the purifying filtered drains, having diverged rays in the subsurface (e.g. ground water) filtration zone, where the accumulation of the large amounts of the moisture is, practically, taken its place, having based on the dense layer of the impervious clay. According the filtered beam drains, the water is flowed down into the dehumidifying chamber, from which it is pumped by the pump for the industrial consumption (e.g. the fountains, the watering, the irrigation and the other water use for the economic purposes and the household needs);

– the drainage is occurred by the filtered drains, having located under the top surface and the under topsoil layer in the active filtration zone, the water is accumulated in the well, which is cut the impervious layer, and it is poured into the underlying aquifer;

– the drainage is taken its place by the filtration radial drains, having situated and disposed in the layer under the sand and the gravel bed plant, under the top surface and the under topsoil layer for all that the water is flowed down into the common dehumidifying chamber, and thence it is fallen into the underlying aquifer;

– the drainage is occurred by the filtered radial drains, for all that there is the process of the under waters collecting and the dumping them down