

CHOICE OF TECHNICAL EQUIPMENT FOR MANUFACTUREING EXTRACTS FROM CITRUS RESIDUES

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High-yielding citrus fruits are the main raw material for the production of pectic extracts in agriculture abroad. Of all types of citrus, high concentrations of pectic substances are found in the squids of oranges, grapefruits and lemons. Any scheme for producing pectin involves an important stage – the extraction of pectic substances from the residues.

For obtaining high-quality pectic products from citrus fruits, not only modern technological processes and formulations are required, but also modern machines and devices meeting all technological requirements, in terms of economy, convenience in maintenance, reliability.

Today, there is a wide range of equipment used at various stages of producing pectic concentrates. In addition, the efficiency and environmental friendliness of the technologies for the production of various types of pectic products greatly depends on technical conditions, improvement and engineering solution of a specific technological task requiring extraction equipment. In addition, modern machines and apparatus for obtaining pectic extracts should be automated with computer and microprocessor technologies providing all technological processes in optimal mode.

When choosing the necessary equipment design for the extraction of pectic substances, it is advisable to determine the main characteristics of the existing equipment.

Thus, stainless and enameled steel is used to operate in an aggressive environment. Some parts of the equipment can be made of food plastic or rubber that can withstand the temperature effect and possess anti-corrosion properties.

In the process of extracting pectic substances, auxiliary processes can be used, among which are the maintenance of constant high temperature in the heat shield or additional equipment by heating technological or working fluid.

The extraction process for pectin-containing raw material occurs in one or more stages. Depending on the equipment, it may have one unit of

equipment or several interconnected apparatuses (extractors). Regarding the type of reagent (water, acid, alkali, enzymes, etc.), the extractors have open, closed, semi-tight or sealed containers. Overall dimensions of the equipment are determined according to functional purpose and technical solution.

As we can see from the above, many extractors are used for the pectin extraction process. One of the features of each type of extractor is the passage time of the process, the presence of the working body and the type of extraction. The devices are equipped with a variety of turbulent elements and additional processes. One of the processes that allows intensify the process of extracting pectic substances is the mixing process. In the case of pectic substances extraction, the mixing process is used for the elimination of the phenomenon of forming the phase of distributing a solution of high concentration near the surface. It slows the mass transfer from the raw material to the solution. Mixing of the technological solution in the process of extraction occurs with the use of additional working units of the device – mixers and rotors of arbitrary shape.

The analysis of various mixing elements, differing in form, size and area of application, shows that disk, blade and turbine mixers can be used for the intensification of pectic substances transition stage into the extractant solution. We have developed a plant for extracting pectic substances, in which a mixing element is set up similar to a shredder used in sweeping machines for mass catering establishments. Such a mixing element will simplify the design of the extraction plant by reducing the metal content. Also, in order to prevent the formation of a well for mixing viscous media, achieving greater uniformity and intensity of mixing, the structure of the stirring element is equipped with special partitions, which are additional blades.

Thus, the production of high-quality low cost pectic extracts requires the creation of not only modern technological processes and formulations, but also the selection and creation of modern hardware equipment for the production process that would meet all technological requirements regarding economy, convenience in service, reliability and environmental friendliness.