

DESIGN FEATURES OF THE VIBRATING-ACOUSTIC EXTRACTOR**Maksymenko K., Kosova V.****Igor Sikorsky Kyiv Polytechnic Institute, vera_62@ukr.net**

Various methods of carrying out the process of extraction differ in several factors: the way of interaction of phases, their ratio, the method of preparation of raw materials, the influence of the structural elements of the apparatus on the stability of the movement of phases, and the like. The choice of apparatus design is carried out on the basis of technological operation, which is carried out in this apparatus, namely the process of extraction, which belongs to the mass-transfer processes, in which the mass-transfer occurs in the systems of solid-liquid.

The operating principle of the submersible unit is based on the use of the cavitation effect in the liquid. The submersible ultrasonic emitter unit consists of an ultrasonic emitter unit made of stainless steel and an ultrasonic generator. The ultrasonic emitters, which convert electrical energy into ultrasonic vibrations, are located on the cover of the unit inside the housing. On the back wall there is a power cord outlet. The submersible unit is connected to the ultrasonic generator [1].

The vibrating acoustic extractor works as follows. Before each cycle of operation the vibrating acoustic extractor is cleaned from the raw material residues, washed with detergents, rinsed with water, if necessary, sterilized with sharp steam. The baskets are loaded with raw material outside the vibrating acoustic extractor and fixed in the working position. During the reciprocating motion of the rod with the baskets with solids fixed on it, the extractant passes through the mesh bottoms in the baskets and washes the solids of raw materials placed in the baskets. Changing the direction of movement of the rod leads to the destruction of the extractant near the surface of the solid particles, intensifying the process of mass extraction. Ultrasonic vibrations in the vibration-acoustic extractor intensify the process of penetration of the extractant into the pores of solids, ultrasonic cavitation destroys the surface of the particles, opens new pores, contributes to the transport of the extractant in the capillaries of solids, improving the process of mass transfer in the solids and increasing the yield of the target product.

The rate of the extraction process depends significantly on the properties of the component that is extracted, the nature of interaction of the plant raw material particles with the component that is extracted, the structure of the porous material, as well as the equilibrium conditions and the kinetics of the process.

References:

1. Вібраційно-акустичний екстрактор : пат. 128749 Україна : B01D 11/02. № у 2018 02722 ; заявл. 19.03.2018 ; опубл. 10.10.2018, Бюл. № 19/2018. 3 с.