

DEVELOPMENT OF METHODS FOR ESTIMATION OF DEGREE SUBEXTRACTION BY COUNTERFLOW EXTRACTION PROCESS OF HERBAL RAW MATERIAL

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Introduction. As a way to organize the counterflow extraction process - is the most effective in terms of economic consume of extragent. We can receive more concentrated extracts with such process organization that reduces the cost of the subsequent evaporation.

The aim of abstract - to obtain a suitable model for calculating of degree subextraction for forecasting parameters of the extraction process.

It is known that the degree subextraction (φ), equal to the amount of biologically active substances (BAS) in expeller to their original amount into raw materials and depends on:

- nature of raw material, extragent, BAS and express in the distribution coefficient BAS between phases (m);
- coefficient retention of extract by skeleton of raw material (Ku);
- coefficient of excess extragent ratio (β).

Materials and methods: The object of study was chosen herb of Leonurus; material - ethyl alcohol 70% v/v. Analysis conducted by gravimetry of dry residue in extracts.

Studies. As a result of the joint solution of equations describing the laws of conservation of mass, equilibrium and kinetics of the extraction process, we determine the degree of dependence of subextraction as:

$$\varphi = \frac{1}{1 + A \cdot (A_0 - \varphi_2)} \cdot \prod_{i=2}^{n-1} \left(\frac{1}{1 + A \cdot (1 - \varphi_{i+1})} \right) \cdot \frac{1}{1 + A}$$

$$A = \frac{\beta \cdot (Ku + 1)}{\frac{1}{m} + Ku};$$

where

$$A_0 = \frac{\beta - \frac{Ku}{Ku + 1}}{\beta}$$

To confirm the adequacy of the mathematical model, we examined five steps maceration of Leonurus herb by 70% v/v ethanol solution. Accuracy between the data and the mathematical model and the experiment represented less than 5%.

Conclusions: the results of the calculation show that the mathematical model is sufficient to adequately describe the process of extraction. What makes it possible to carry out calculations at different conditions of the extraction process with subsequent analysis of the results.