

TECHNOLOGIES OF CRYOGENIC MOLECULAR FRACTIONATION OF BIOMATERIAL IN OBTAINING OF INGREDIENTS FOR PHARMACEUTICAL, COSMETIC AND FOOD PRODUCTS

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Nowadays there is a rapid increase in using natural biological raw materials of vegetable and animal origins in pharmaceutical, cosmetic, food industries, manufacture of natural dyes, flavors, "green" chemistry products etc. However, efficient development of this branch faces a difficult technological issue: exclusion of required molecular and biological activity from raw material. Experiments prove that the solution of this problem is possible due to usage of cryogenic technologies. In this report we study technological complex, which permits to divide raw materials into separate fractions. In this case the instructor composition and features are determined according to their further usage. The principal difference of our complex from other analogues is that the processing includes only cryogenic steps: rapid freezing, cryogenic grinding, freeze-drying molecular fractionation, low temperature extraction with usage liquefied gases.

Here we compared the systems of cryosublimation fraction, using the cooling of desublimators by means of liquid nitrogen and the modern refrigeration units, and discussed their advantages. In terms of the analysis of ternary diagrams of complex aqueous solutions and the composition of obtained fractions there were selected the optimal temperature and time regimens for implementation of cryosublimation fractional of porcine placental tissues and aromatic plants. The dependence of amino acid, mineral and hormonal compositions of the obtained aqueous fractions of porcine placenta on the used fractionation regimens was established. In particular, these regimens were shown to enable varying the content of the main amino acids and hormones in this fractions within a wide range. For example, the content of alanine, valine, histidine, isoleucine, lysine in the obtained fractions may be changed by dozens of times, and the content of such hormones as prolactin, FSH, testosterone, progesterone, cortisol varies 5-6 times depending on fractional parameters.

Liofilization biopowder remained in sublimation chamber is a perfect product for selective extraction of lipid fraction by liquid gases. If select solution from liquid chlorofluorohydrocarbons it is possible to effectively differentiate molecular structure of biologically active oils, produced from raw materials. In the work we studied principles of production of these compositions, according to physicochemical features of initial gases and kinds of recast raw materials.

In fact, the ingredients produced on certain steps of fractionation of raw biomaterials are preformed cosmetic and pharmaceutical products in many cases.