

Таким чином, до складу таблеткової маси увійшли окрім порошків рослинної сировини наступні компоненти: кальцію стеарат та крохмаль у вигляді 15% крохмального клейстеру в якості зволожувача.

Література:

1. Допоміжні речовини у виробництві ліків : навч. посібн. / О.А. Рубан, І.М. Перцев, С.А. Куценко, Ю.С. Маслій; за ред. І.М. Перцева. Х. : Золоті сторінки, 2016. 720 с.
2. Допоміжні речовини у розробці лікарських засобів: фармакологічні, фармацевтичні та технологічні аспекти / Д.С. Савченко, Ю.А. Курапов, Є.П. Воронін, І.С. Чекман. *Запорізький медичний журнал*. 2011. Т. 13. № 5. С. 122-129.

ENCAPSULATION AS A METHOD OF STABILIZING UNSTABLE COMPONENTS IN COSMETIC PRODUCTS

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The paper considers a method for stabilizing components in a cosmetic product, which helps to maximize the preservation of quality indicators, product appearance, and beneficial active ingredients that are easily degraded by environmental factors.

Encapsulation of active ingredients is an innovative technology that allows to put in details into additional factors of components. This technology is used in perfumery and cosmetics, food and pharmaceutical stores, in the in particular in the cosmetics industry, where it changes approaches to skin care and the creation of makeup formulas. Encapsulation ensures stability, effectiveness and controlled release of active substances during and after application. It not only protects sensitive ingredients from the environment, but also increases the effectiveness and longevity of cosmetic products. Due to this technology, products are created that are more efficient and convenient to use [1-3].

Encapsulation is an alternative solution to overcome the problems of physical or chemical instability of compounds. Microcapsules can reduce evaporation and protect the encapsulated material from the negative effects of the environment, reducing the sensitivity of plant materials and their biologically active substances to degradation. Also, this technology helps to keep the necessary compounds in the systems formed during the processes, continuing their gradual release for a longer period. Thus, encapsulation helps reduce volatility losses, maintain biological integrity, increase efficacy, improve commercial viability and formulation stability [2, 3, 7].

To create a microcapsule many of polymers are used as material which make a covering to protect a kernel, usually formed by biologically active compounds. For

this purpose usually use chitosan, gums (e.g., gum arabic, xanthan gum, acacia gum, and shellac), maltodextrin, pectin, starch, whey protein, sodium alginate, cellulose and carboxymethylcellulose, zein, pullulan, galactomannan, and sodium caseinate, etc., are commonly used [5, 6, 8].

The essence of the encapsulated cosmetic component is that every microcapsule contains an active substance, which is released into the main phase when the microcapsules are broken by mechanical action or elevated temperature applied to the cosmetic formula. To achieve the desired effect every microcapsule has a kernel, which contains up to 70% of active ingredient by weight and the general concentration is from 2% to approximately 60% of the main phase.

Every particle of substrate which keeps an active substance, has a heterogeneous surface and is released into the main phase upon mechanical impact on the cosmetic product. Cosmetic product can be a lipstick, blush, face powder, foundation, eye shadow or another cosmetic product. When shear stress is applied (e.g., rubbing against the skin), the “dormant” component is activated, providing a gradual release of the active ingredient.

The inclusion of innovative technology in cosmetic formulas provides many advantages:

- **Product stability:** encapsulation protects the active ingredients from oxidation, photodegradation and premature decay due to environmental factors, ensuring their effectiveness over time;

- **Greater efficiency:** by preserving the integrity of the active ingredients until they are delivered to the skin, encapsulation increases the overall effectiveness and benefits of cosmetic products;

- **Improved compatibility:** encapsulated ingredients can be more easily incorporated into different formulas without negative interactions with other components, preserving the aesthetic qualities and texture of the product;

- **Ease of use:** Products with encapsulated ingredients can offer a more pleasant application experience, reducing irritation and providing a noticeable effect;

- **Extended shelf life:** A protective barrier around encapsulated ingredients reduces the risk of degradation and extends the shelf life of the product, offering greater value to consumers;

- **Innovation and product differentiation:** The use of encapsulation technology allows brands to innovate and differentiate their products in a crowded market, appealing to consumers looking for advanced skincare solutions.

- **Targeted use:** Encapsulation can be used to release active ingredients in response to specific triggers (such as pH changes or enzyme action), allowing for targeted treatment of skin concerns.

We believe that the described technology should be gradually introduced into production as a way to create more stable and effective cosmetics, and that the technology of encapsulation of components can be the beginning of the creation of more diverse and interesting cosmetics that have a longer-lasting effect and result during use.

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