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### OBTAINING COSMETIC TOILET SOAP, POSSESSING IMPROVED CONSUMER PROPERTIES

A method for producing a cosmetic soap including natural ingredient and soap base. As a natural soap component used propylene glycolic extract of camomile, peppermint, or a mixture of the extract and the materials extracted from the crushed particle size of 1 to 2 mm, obtained by extracting the crushed raw material in the raw materials and the ratio of extractable extractant (1 : 10 – 1 : 20), at a temperature of 20–60°C for 10–50 minutes, and added in an amount of 1–4% by weight of the soap base.

**Introduction.** Works in biology, chemistry and medicine and also increased requirements of customers to the quality of cosmetics and toilet soap have determined the necessity of search of new technology solutions and production methods.

Market trend analysis has shown that most perspective production group is high quality natural soaps with cosmetic properties [1]. In connection with that the urgent task is development of means of receiving special toilet soaps with implicit softening, antiallergic, wound-healing and protective properties.

The assortment of domestic samples of such production is quite limited; in addition they are characterized by lack of balance between the main application properties of soap and claimed cosmetic effect.

At present most of soap-making enterprises include bioactive substances in type of extract; that is why manufacturing enterprises control contents and activity of chemical mixtures in extracts. The most valuable are standardized extracts, in which content of important active constituents is known and is not less than of the established level. Standardization is made by one or several active constituents. The lack of domestic standardized extracts leads to necessity of use of foreign raw material by domestic manufacturers, the prices for which are sometimes higher than the cost of the toilet soap at domestic market, which creates uneven playing field for domestic products.

The technology of hard toilet soap has practically not changed for recent decades, but a tendency of improvement of its application properties at the account of including different biologically active additives, adding health properties has appeared.

Modern customer while choosing soap more often pays attention not only to its smell and colour, but also to its cosmetic properties. Soap is not only disinfectant now. In connection with that there are tendencies of including different softening, moisturizing and other additives to soap, which add certain cosmetic properties to the soap. Naturality of included additives is very important. That is why one of priority growth areas during toilet soap production is including of natural plant-extracted products to its base, which allows adding

certain health and beauty and cosmetic properties, distinguishing color and genuine natural aroma of the original plant [2, 3].

As raw material for extracts officinal and savoury-aromatic plants. According to expert opinion of the Central botanic garden of the National Academy of Science of Belarus, environmental conditions of our country allow cultivating not less than 100 types of on the field officinal and savoury-aromatic plants of local and world flora [4]. Among wild plants there are nettle, danewort, buckthorn, wild chamomile, dandelion, viola tricolor, horsetail, tickseed, celandine, mountain ash, hawthorn, pine buds, birch buds, etc. Beside that calendula, marjoram, mint, balm, sage, hyssop, milk thistle, giant hyssop, Jacob's-ladder, coneflower, begonia, setwell and many other plants are grown.

One of the most perspective types of drug raw materials growing in the Republic of Belarus is wild chamomile and peppermint, which have a wide range of useful properties.

Means of receiving toilet soap including receiving soap base with addition of bioactive substances in form of oily, propylene glycol and hydroalcoholic extracts of officinal and savoury-aromatic plants [5], increasing cosmetic and application properties of soap are known.

A disadvantage of means of receiving toilet soap with use of oily extracts of plants is the fact that they only contain on oil-soluble constituents extracted by oils, but there are no bioactive water-soluble materials. Use of propylene glycol extracts containing different amount of water (from 0.1 to 95% wt.) allows increasing yield of bioactive flavonoids [6]. However at receiving the mentioned types of extracts full extract of biologically active agents is not provided and part of them stays in raw material input.

The aim of this work is diversification of toilet soaps including natural components and development of means of its receiving, which provide maximum possible preservation of useful properties of natural components.

**Main part.** Dried wild chamomile (peppermint leaves) was ground up to particles of 1–2 mm and was extracted at mass ratio of dry raw material and

extraction agent of (1 : 10) – (1 : 20), temperature 20–60°C during 10–50 minutes. Before extraction the content was mixed to distribute particles of ground raw material evenly in all the volume of extraction agent. In the wild chamomile extract the content of volatile essence, flavonoids, carotins and chlorophyll was determined. In peppermint extract the content of volatile essence and carotins was determined. Soap base was melt in glycerine bath and mixture of extract with particles of ground raw material in amount of 1–4% of soap base mass was added. After addition of all the mixture the mass was mixed with mechanical mixer during 30 minutes, after that it was moved to a form and was left to complete refrigeration. In the residue of the raw material after extraction and in the end product the content of the mentioned bioactive substances was determined. Analysis of distribution of particles of natural component was made by visible inspection.

Monopropylene glycol is an alkahest of bio-complex which is contained in spicy and aromatic raw material, as it dissolves polar water-soluble compounds as well as nonpolar components of volatile essence, flavonoids and other bioactive substances. Besides, monopropylene glycol extracts of plant materials provide preservation of microbial enumeration of extracts up to 12 months and increase the yield of extractable substances. The use

of natural component in type of mixture of extracted particles of raw material containing in propylene glycol extract allows increasing its cosmetic effect and health properties.

Preparation of natural component based on wild chamomile and peppermint in type of mixture of particles of raw material in propylene glycol extract by gridding the particles of raw material up to 1–2 mm, extracting bioactive substances by monopropylene glycol extracting at ration of extracted raw material to extracting agent (1 : 10) – (1 : 20), temperature 20–60°C during 10–50 minutes and addition to soap base provide more complete content of bioactive substances in toilet soap and increasing its application properties.

In tables 1 and 2 the content of main bioactive substances in cosmetic toilet soap depending on the amount of mixture of raw material and extract in different conditions of extract receiving are given. The use of propylene glycol extracts in type of mixture of ground particles of wild chamomile and peppermint at extracts receiving provides more complete extraction of different bioactive substances (if wild chamomile is used it is volatile essences, flavonoids, carotins, chlorophyll; if peppermint is used it is volatile essences and carotins) under the following extraction conditions: ratio of the extracted raw material to extracting agent 1 : 20, extraction temperature 60°C, prolongation 60 minutes.

Table 1

**Content of main bioactive substances in cosmetic toilet soap depending on the amount of the mixture of raw material and extract**

Type of raw material	Main bioactive components in original raw material		Amount of bioactive substances in extract / mixture of raw material and extract in toilet soap (depending on the amount of additive to the soap, %)			
	Name	Amount	1	2	3	4
Wild chamomile	Volatile essence, %	0.58	0.52 / 0.0057	0.53 / 0.0114	0.51 / 0.0172	0.52 / 0.0229
	Flavanoids, mg %	1.95	1.77 / 0.0193	1.78 / 0.038	1.77 / 0.057	1.76 / 0.077
	Carotins, mg %	0.15	0.13 / 1.4·10 <sup>-3</sup>	0.14 / 2.8·10 <sup>-3</sup>	0.13 / 4.3·10 <sup>-3</sup>	0.13 / 1.8·10 <sup>-3</sup>
	Chlorophyll, mg %	17.0	15.4 / 0.16	15.5 / 0.33	15.5 / 0.49	15.4 / 0.67
Peppermint	Volatile essence, %	1.65	1.51 / 0.0128	1.49 / 0.0262	1.52 / 0.0402	1.54 / 0.0529
	Carotins, mg %	0.07	0.06 / 5.2·10 <sup>-4</sup>	0.06 / 1.1·10 <sup>-3</sup>	0.058 / 1.4·10 <sup>-3</sup>	0.062 / 2.2·10 <sup>-3</sup>

*Note:* Extracts were received with ratio of extracted raw material to extracting agent 1 : 20, temperature 60°C and prolongation of 50 minutes.

Table 2

**Content of main bioactive substances in cosmetic toilet soap depending on the amount of mixture of raw material and extract**

Type of raw material	Main bioactive components in original raw material		Amount of bioactive substances in extract / mixture of raw material and extract in toilet soap (depending on the amount of additive to the soap, %)			
	Name	Amount	1	2	3	4
Wild chamomile	Volatile essence, %	0.58	0.0696 / 6.9·10 <sup>-4</sup>	0.0710 / 1.42·10 <sup>-3</sup>	0.0690 / 2.21·10 <sup>-3</sup>	0.0705 / 2.82·10 <sup>-3</sup>
	Flavanoids, mg %	1.95	0.186 / 1.85·10 <sup>-4</sup>	0.168 / 3.19·10 <sup>-3</sup>	0.175 / 5.08·10 <sup>-3</sup>	0.168 / 6.38·10 <sup>-3</sup>
	Carotins, mg %	0.15	0.012 / 1.08·10 <sup>-4</sup>	0.011 / 2.07·10 <sup>-4</sup>	0.011 / 3.08·10 <sup>-4</sup>	0.012 / 4.68·10 <sup>-4</sup>
	Chlorophyll, mg %	17.0	1.38 / 0.0116	1.40 / 0.0252	1.42 / 0.0397	1.45 / 0.0558
Peppermint	Volatile essence, %	1.65	0.145 / 1.16·10 <sup>-3</sup>	0.138 / 2.46·10 <sup>-3</sup>	0.143 / 4.15·10 <sup>-3</sup>	0.144 / 5.47·10 <sup>-3</sup>
	Carotins, mg %	0.07	6.2·10 <sup>-3</sup> / 5.56·10 <sup>-5</sup>	6.0·10 <sup>-3</sup> / 1.14·10 <sup>-4</sup>	6.1·10 <sup>-3</sup> / 1.77·10 <sup>-4</sup>	6.1·10 <sup>-3</sup> / 2.32·10 <sup>-4</sup>

*Note:* Extracts were received with ratio of extracted raw material to extracting agent 1 : 10, temperature 20°C and prolongation of 10 minutes.

Adding the received mixtures of extract and natural component leads to high content of bioactive substances in toilet soap.

**Conclusion.** As can be seen from the above, addition of a natural component and peppermint contained in propylene glycol extracts, to soap base allows receiving soap with better cosmetic and health properties.

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