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(54) Title: COMPOSITION FOR SHAMPOO WITH WATER REDUCTION AND PROCESS FOR OBTAINING THE SAME

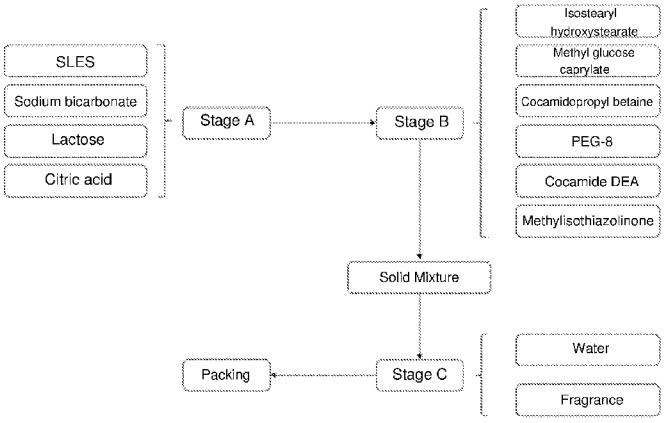

FIG 1

(57) Abstract: This invention relates to the development of a shampoo with water reduction, providing a practical, sustainable and efficient product with applicable yield, cleansing and moisturizing the hair strands. With increasingly demanding and interested consumers for unusual products, but with convenience and effectiveness, there is a great motivation to develop a shampoo, which would occupy small spaces in terms of transport and storage and that is practical to the eyes of the consumer, without having to change their habits regarding the application of the product. In addition, the shampoo should present positive results concerning the acceptance by the public, cleaning power, beautification of the hair and hydration of strand.

[Continued on next page]

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"COMPOSITION FOR SHAMPOO WITH WATER REDUCTION AND PROCESS FOR OBTAINING THE SAME".

FIELD OF THE INVENTION

[0001] This invention relates to the development of a shampoo with water reduction, providing a practical, sustainable and efficient product with applicable yield, cleansing and moisturizing the hair strands.

BACKGROUND OF THE INVENTION

[0002] The operation areas of cosmetic industry become increasingly diverse, ranging from the preparation of moisturizing emulsions to products for complex applications. With the constant growth of this sector and the increased concern for the environment and natural resources, it is important to present innovative, practical and sustainable products.

[0003] Regarding the cosmetic industry, production and marketing of perfumery articles, including perfumes and eau de cologne, cosmetics, such as makeup, body creams, nail polish and sunscreens, and personal care products, in which are included shampoos, conditioners, soaps, deodorants, among others are encompassed in this segment.

[0004] Shampoos are available as a liquid, gel, cream or mousse and have as its main objective the cleaning and care of the hair, left by the sebaceous glands secretion (sebum) and residues present on the scalp due to air pollution and other products.

DESCRIPTION OF THE STATE OF THE ART

[0005] Several studies have been conducted for new compositions of shampoos, aimed at differentiated and attractive products for the end costumer.

[0006] The Document BR 11 2016 005848-8 relates to a dry shampoo comprising a base and a propellant, different from the present invention, which comes in powder.

[0007] A composition for improvement in a shampoo, more specifically a powder shampoo, is revealed through the document BR 10 2013 012152 5; however, the document features no study that proves the efficacy of the product, as well as no detailing of its method of production.

OBJECT OF INVENTION

[0008] With increasingly demanding and interested consumers for unusual products, but with convenience and effectiveness, there is a great motivation to develop a sustainable shampoo with water reduction, which would occupy small spaces in terms of transport and storage and that is practical to the eyes of the consumer, without having to change their habits regarding the application of the product. In addition, the shampoo should present positive results concerning public acceptance, cleaning power, hair embellishment and strand hydration.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Fig. 1 represents a flow chart of the manufacturing process of the shampoo with water reduction.

DETAILED DESCRIPTION OF THE INVENTION

[00010] This invention discloses a shampoo composition comprising the raw materials described below:

CITRIC ACID

[00011] Citric acid is a weak organic acid that naturally occurs in human metabolism, and it also can be found in high concentrations in citrus fruits. It is a compound widely used in food and cosmetic industries for several functions (EMFAL, 2015).

[00012] This acid and its salts of potassium and sodium can be used as a natural preservative due to its chelating (except for alkali earth metals) and anti-microbial (inhibits the growth of bacteria, bacilli and fungi) properties. Citric acid also has strong antioxidant action, and is often used in anti-aging creams (COSMETICS INFO, 2016).

[00013] Additionally, citric acid is one of the main pH regulating agents applied in cosmetic formulations for skin and hair. It shows high solubility in water, being easily incorporated into formulations in the form of a solution (COSMETICS INFO, 2016).

COCAMIDE DEA

[00014] Cocamide DEA is a mixture of diethanolamides of fatty acids found in coconut oil, such as mistiric, lauric, palmitic, among others (NETO et al, 2013). It is a nonionic surfactant widely used in cosmetic formulations for its action as refatting, thickener and

stabilizer. Fatty acids diethanolamides are generally used as co-surfactant, mostly in association with sulfated fatty alcohols and ethoxylated fatty alcohols due to the interaction of the amide group with ions of the anionic surfactants, providing system thickening and foam stability (MAPRIC, 2016). In addition, they show great ability to solubilize plant extracts and give hair conditioning (NETO et al, 2013).

[00015] This raw material can be obtained from the condensation reaction of diethanolamine with coconut fatty acids, with the methyl ester of coconut fatty acid and coconut oil himself at temperatures of up to 170° and in the presence of an alkaline catalyst (NETO et al, 2013).

COCAMIDOPROPYL BETAINE

[00016] Cocamidopropyl betaine (CAPB) is an amphoteric surfactant widely used for the formulation of shampoos, soaps and shower gels due to its compatibility with anionics, cationics and nonionics surfactants. It presents a hydrophilic nature due to the betainic group of its molecule and lipophilic nature from its carbonic chain derived from coconut fatty acid. CAPB can be synthetically obtained by the condensation reaction of coconut oil with dimethylpropylamine (OXITENO, 2011).

[00017] This raw material gives the product properties such as low irritability to the eyes and skin, improved touch, increased viscosity and stability of foam. In shampoos, it is common the usage of Cocamidopropyl Betaine in association with anionic surfactants such as

sodium lauryl ether sulfate, providing greater potential for cleaning and thickening of the formulation, formed foam creaminess and conditioning of the hair (FAGRON, 2016).

ISOSTEARYL HYDROXYSTEARATE

[00018] It is an emollient commonly used in cosmetic formulations as moisturizing lotions, hair products and makeup. It presents soft and buttery texture, so that it is a good viscosity donor, fat-blocking, and non-stick agent. It provides good spreadability, flow properties and liquefies when in contact with skin (LUBRIZOL, 2016).

LACTOSE

[00019] Lactose is an organic polymer consisting of natural monomers. It is a disaccharide (ether of two monosaccharides or simple sugars), consisting of a glucose unit and one galactose unit (ABRUTYN, 2016).

[00020] The monosaccharides, disaccharides and related ingredients have numerous functions reported in cosmetics, being the most common use as moisturizing agents and skin softeners. They are also typically used as rheology modifiers, bulking agents, film makers, exfoliators, among others. Lactose is widely employed as support, thinner and auxiliary of flow to dry powder formulations and in direct compression (CIR, 2014).

METHYL GLUCOSE CAPRYLATE

[00021] Methyl Glucose Caprylate is an extremely effective nonionic thickener, mainly used in personal care products like shampoos and soaps, facial and body fluids.

Derived from corn (93% derived from bulk vegetable) it is a non-ethoxylated methyl glucose ether, esterified with capric, caprylic and oleic acids and provided as a light yellow liquid (PROSPECTOR, 2016).

[00022] This ligand is compatible with a wide range of surfactant systems (both ethoxylated and not ethoxylated), being ideal for formulations in which properties such as clarity and smoothness are required. It is completely cold processable and can reduce the total cost of the formulation as it is provided with 80% of total solids in bulk (LUBRIZOL, 2016).

METHYLISOTHIAZOLINONE

[00023] Methylisothiazolinone is a heterocyclic organic compound used as a preservative in cosmetics and personal care products. It is a colorless, clear, mild odor and completely water-soluble liquid. It also has good solubility in acetonitrile, methanol and hexane and low penetration in the skin (CIR, 2010).

[00024] This preservative is generally recommended for use in products with rinse, such as soaps and shampoos. Its use is restricted to low concentrations (up to 0.01%) which prevents skin sensitization, but does not interfere in its effectiveness of preservation (CIR, 2010).

PEG-8 (POLYETHYLENE GLYCOL)

[00025] Polyethylene Glycols are condensation polymers of ethylene oxide with water or ethylene glycol and derivatives, used for various purposes in cosmetic formulations, depending on its molecular weight (CIR,

2010). By varying the molecular weight, it's possible to get liquid or solid products, covering a wide range of viscosity and consistency (MAPRIC, 2016).

[00026] PEG-8 has applications as a humectant, fragrance fixative, consistency agent, viscosity regulator and antistatic agent. It is a hygroscopic polymer, very soluble in water due to the hydrophilic trait of the polyoxyethylene chain. It is very used in formulations of creams, lotions, shampoos, soaps and make-up (SPECIALCHEM, 2016).

SODIUM BICARBONATE

[00027] Sodium bicarbonate is an odorless, lightly alkaline-flavored, white crystalline powder. It is usually employed in pharmaceutical formulations as a source of carbon dioxide in tablets and granules. It is also used to maintain or produce an alkaline pH in preparations (MAPRIC, 2016).

[00028] Sodium bicarbonate has antiseptic action, limiting the bacterial proliferation by alkalinization. In cosmetic formulations, sodium bicarbonate performs functions of effervescent agent, form agent, cleaning agents, abrasive, among others. It brings several benefits to formulations of facial soaps, scrubs, toothbrushes and shampoos (MAPRIC, 2016).

SODIUM LAURETH SULPATE

[00029] Sodium laureth sulfate (SLES) is one of the most widely used anionic surfactants in cosmetics and personal hygiene industry. This can be attributed to its

cost-benefit and high compatibility with the vast majority of surfactants and ingredients used in this type of formulation. It is a component widely employed in the manufacture of bath gels, toothpastes, shampoos and others (OXITENO, 2016).

[00030] SLES is an alkyl sulfate obtained from the reaction between ethoxylated saturated fatty alcohols and sulphur trioxide, followed by alkaline neutralizing. The increase in ethylene oxide content increases the resistance to water hardness and decreases irritating power of these surfactants when compared to non-ethoxylated saturated fatty alcohols (OXITENO, 2016).

[00031] Among its various usages, SLES can be used as an emulsifying, cleansing agent and foam stabilizer. Associated with other surfactants, such as betainics, it produces mild formulations of low irritability and high performance (FAGRON, 2016).

WATER

[00032] Water is present in the formulation of virtually all classes of cosmetic and personal care products. Mainly used as a solvent, it dissolves most of the important ingredients for skin, such as cleansing and moisturizing agents (COSMETICS INFO, 2016).

[00033] Water is found in the compositions of lotions, creams, liquid soaps, deodorants, makeup, shampoos, conditioners, among many others (COSMETICS INFO, 2016).

MANUFACTURING PROCESS

[00034] In the manufacturing process of the shampoo with water reduction, raw materials are divided into three stages, as shown in Table 1:

Table 1: Raw Material List

Stage	Raw Material	Function
Stage A	Lactose	Emollient
	SLES	Anionic surfactant
	Sodium bicarbonate	Effervescent agent
	Citric acid	pH Regulator
Stage B	Isostearyl hydroxystearate	Emollient
	Methyl glucose caprylate	Binder
	Cocamidopropyl betaine	Amphoteric surfactant
	PEG-8	Humectant
	Cocamide DEA	Foaming agent
	Methylisothiazolinone	Preservative
Stage C	Water	Solvent
	Fragrance	Odor

[00035] For Stage A, the solid raw materials are weighted in analytical balance in the following proportions:

15.00% to 20.00% of sodium laureth sulfate;

25.00% to 30.00% of sodium bicarbonate;

12.00% to 16.00% of lactose;

20.00% to 26.00% of citric acid,

and mixed in a beaker.

[00036] In parallel, for Stage B, all the raw materials, with the exception of water and fragrance, are weighted and mixed in another beaker in the following proportions:

1.00% to 5.00% of cocamide DEA;

0.50% to 3.00% of methyl glucose caprylate;

1.00% to 5.00% of isostearyl hydroxystearate;

2.00% to 4.00% of cocamidopropyl betaine;

0.00% to 0.10% of methylisothiazolinone;

0.50% a 4.50% of PEG-8.

[00037] For Stage C, it is blended 0.05% to 0.15% of fragrance and 2.00% to 10.00% of deionized water.

[00038] Stage A and Stage B are joined by homogenizing under manual agitation with the aid of a drumstick.

[00039] Then, Stage C is slowly added under constant stirring, assisting the compression of the solid and liquid raw materials, forming a solid and homogeneous mixture, however with a little moisture.

[00040] Said mixture should rest between 30 to 60 minutes before going through the sieving process, avoiding losses in this process because of its moisture.

[00041] The sieving process is performed using a 40-425 micron mesh sieve so that all particles of powdered shampoo stay uniform and, after it, the product is ready for packaging.

TEP ESSAYS (PRELIMINARY STABILITY TEST)

[00042] Some essays were performed for determining the stability and quality of the final product, hydrogen potential, organoleptic, moisture, water activity and shelf life.

A) Hydrogen Potential Essay:

[00043] Hydrogen potential measures were performed using two types of samples: foam produced by the mixture of this shampoo with water and a 1% solution of shampoo.

[00044] The equipment used was previously calibrated with standard solutions of pH 4.00 and 7.00, and then the electrode was removed from the protective solution of potassium chloride and washed with distilled water. The electrode was immersed in the analyzed sample and noted the value displayed in the electronic panel after stabilized.

[00045] Essays were conducted in duplicate for each sample type, obtaining the following pHs concerning two samples prepared according to Table 2.

Table 2

Foam	Solution 1%
5.64	5.47
5.66	5.46

[00046] In all cases, it is observed that the pH range is between 5.00 and 6.00, which indicates that the product is suitable for use on the scalp.

B) Organoleptic Essay:

[00047] To carry out organoleptic essays of shampoo with water reduction, natural hairs were used from three different individuals and defined the amount of 1.5 grams of product.

[00048] The dirty strands were wet with water, the product was applied directly to the scalp and began the process of massage with foaming, enabling the distribution of the product and the consequent washing of the hair.

[00049] Both in synthetic hair and natural hair, it has been noted that the strands became clean and free from residues and products particles, acquired a hydrated and soft aspect. It has been found that the foam presented itself properly and in good amount, which facilitated the spreadability and product application on hairs.

C) Moisture Essay:

[00050] Moisture essay was performed in duplicate in order to verify if the amount of water indicated on the equipment reading is similar to the amount of water used in the formulation and to determine the process and product losses. In addition, the moisture relates to its stability and may affect the storage, packaging and processing.

[00051] For this analysis, the Gravimetric method was used. This method consists in quantitative analysis that lets one know the amount of a substance in a given

mixture. The process involves separation and weighing of an element or a compound of the element in its purest form possible, using the mass of the substance to determine how much of this was present in the sample.

[00052] After drying the shampoo for 3 minutes at a temperature of 60°C, the equipment indicated the following moisture levels, shown in Table 3.

Table 3

Essay	Moisture content (%)
1	2.35
2	2.37

[00053] It has been noted that the average value of moisture obtained was 2.36, having a water loss of less than 5.0% compared to water present in the product formulation.

D) Water Activity Essay:

[00054] Water activity essay was conducted in order to determine whether there is a possibility of proliferation of microorganisms in the product. In addition, in accordance with the *Guia da Qualidade de Cosméticos* (Brazilian Cosmetics Products Quality Control Guide), published by ANVISA, “microbiological evaluation allows you to check if the choice of the preservative system is suitable, or if the occurrence of interactions between the components of the formulation may impair his effectiveness”.

[00055] The analysis was performed in duplicate, at a constant temperature of 25°C.

[00056] Duplicate results of water activity essay are shown in Table 4.

Table 4

Essay	Water activity
1	0.715
	0.716
	0.715
2	0.715
	0.714
	0.715

[00057] It has been noted that the average value of water activity was around 0.715, with only the possible presence of molds, and proving the use of preservative in the shampoo. In addition, the preservative to be used must present properties able to combat the proliferation of this type of microorganism in a way that does not harm the effectiveness of the product.

[00058] As a result of the formulation essays, a powder shampoo with 95% water reduction compared to conventional shampoos found in markets was achieved. Further, all the studies involved allowed to obtain an innovative and sustainable product, proving that this is a safe and effective cosmetic product.

CLAIMS

1. COMPOSITION FOR SHAMPOO WITH WATER REDUCTION, wherein it comprises:

a) Stage A:

15.00% to 20.00% of sodium laureth sulfate;

25.00% to 30.00% of sodium bicarbonate;

12.00% to 16.00% of lactose;

20.00% to 26.00% of citric acid;

b) Stage B:

1.00% to 5.00% of cocamide DEA;

0.50% to 3.00% of methyl glucose caprylate;

1.00% to 5.00% of isostearyl hydroxystearate;

2.00% to 4.00% of cocamidopropyl betaine;

0.00% to 0.10% of methylisothiazolinone;

0.50% a 4.50% of PEG-8;

c) Stage C:

0.05% to 0.15% of fragrance;

2.00% to 10.00% of deionized water.

2. COMPOSITION FOR SHAMPOO WITH WATER REDUCTION, according to claim 1, wherein pH is ranging from 5.00 to 6.00.

3. COMPOSITION FOR SHAMPOO WITH WATER REDUCTION, according to claim 1, wherein it presents an average value of moisture of 2.36%.

4. COMPOSITION FOR SHAMPOO WITH WATER REDUCTION, according to claim 1, wherein it presents 95% water reduction.

5. PROCESS FOR OBTAINING THE SHAMPOO WITH WATER REDUCTION, wherein it comprises the following stages:

a) weighting each raw material of Stage A in analytical balance and mix it in a beaker;

b) weighting each raw material of Stage B in analytical balance and mix it in a beaker;

c) weighting each raw material of Stage C in analytical balance and mix it in a beaker;

d) mixing Stage A with Stage B under manual stirring, until complete homogenization;

e) adding Stage C slowly under constant stirring, until the formation of a solid homogeneous mixture;

f) leaving the solid homogeneous mixture to rest for 30 to 60 minutes;

g) sieving the solid homogeneous mixture using a 40-425 micron mesh sieve;

h) packaging.

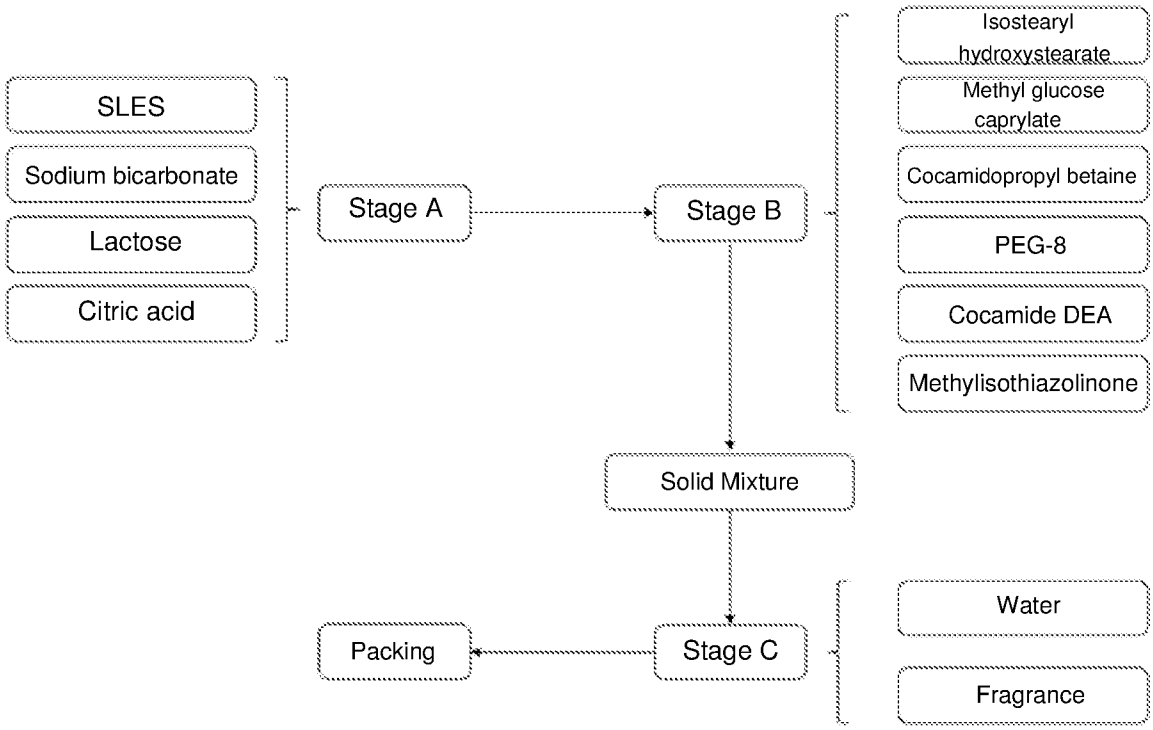
SLES
Sodium bicarbonate
Lactose
Citric acid
Stage A
Stage B
Isostearyl hydroxystearate
Methyl glucose caprylate
Cocamidopropyl betaine
PEG-8
Cocamide DEA
Methylisothiazolinone
Solid Mixture
Water
Fragrance
Stage C
Packing

FIG 1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/BR 17/50124

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - A61K 8/46, A61K 8/891, A61K 8/892 (2018.01)
CPC - A61K 8/463, A61K 8/891, A61K 8/892

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History Document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

See Search History Document

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History Document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,641,480 A (Vermeer) 24 June 1997 (24.06.1997) Abstract; col 1 ln 1-5; col 77 ln 50-60; col 37 ln 45-50; col 79 showing table)	1-5
A	US 2005/0201965 A1 (Kuhlman et al.) 15 September 2005 (15.09.2005) Abstract, para [0025], Table 1; para [0061], para [0014], para [0044]	1-5
A	US 2004/0052826 A1 (Fernandez-kleinlein et al.) 18 March 2004 (18.03.2004) Abstract; para [0092], para [00100], examples 1-9	1-5
A	US 6,153,208 A (McAtee et al.) 28 November 2000 (28.11.2000) Abstract, col 3 ln 35-40; col 20 ln 1-5; col 29 ln 40-45; col 42 ln 40-70	1-5
Y, P	WO 2017/202477 A1 (Symrise AG) 30 November 2017 (30.11.2017) Abstract; tables 1-6	1-5

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
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Date of the actual completion of the international search	Date of mailing of the international search report
10 April 2018	19 APR 2018
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