FRAGRANCE COMPOSITIONS EXHIBITING ENHANCED INTENSITY

FIELD OF THE INVENTION

The present disclosure relates to fragranced (consumer) products containing fragrance compositions. Said fragrance compositions comprise at least one fragrance ingredient and at least one amylopectin-based material. The fragranced consumer products may belong to the group of daily consumer products (FMCG products) such as, but not limited to, home care products, personal care products, oral care products, and the like. The present invention also relates to a method for enhancing or improving the overall perceived fragrance intensity of a fragrance composition or consumer product.

BACKGROUND OF THE INVENTION

One sought after benefit of fragranced consumer products is the generation of surprising olfactive effects during use. These surprising olfactive effects may arise as a result of the dissolution of solid or liquid products, such as powder detergents, shampoos, hand-washing gels into water and the concomitant release of fragrance ingredients, providing the user with a pleasant olfactive experience during application or use of the product as well as providing the reassurance of an olfactive cue related to the product's efficacy. Such an enhanced consumer experience may present itself as an increased overall perceived fragrance intensity (hereinafter referred to alternatively as "PFI"). Enhancing the overall perceived fragrance intensity (or fragrance release) quickly, generally within the first 60 seconds after dilution of the product with a diluent, is of high importance to the consumer product industry in order to positively augment customer experience.

Furthermore, the benefit of fragrances is only obtained if the fragrance ingredients evaporate from the product into the vapor phase and enter the human olfactory system through inhalation. Any remaining fragrance ingredient in the liquid phase is therefore essentially redundant in the product. For many fragrance ingredients, only fractions of a percent by mass will evaporate into the vapor phase. This essentially means that the liquid-to-gas mass transfer process is highly inefficient. Water is used by the end consumer in a variety of FMCG products, such as shampoos/conditioners, shower gels and body washes, hand soaps etc. In these environments, fragrance ingredients partition between distinct phases: including within the surfactant micelle core, the free aqueous phase and in the headspace. Transfer into the headspace in such systems does not follow ideal gas laws, owing to, *inter alia*, inelastic energy scattering and incorporation of fragrance ingredients into micelles. Modulating the liquid-to-gas mass transfer process thus can play a role in the odour perception of a product containing the fragrance composition, which comprises the fragrance ingredients.

In the prior art, different chemical molecules such as saccharides have been employed to enhance the mass transfer of simple fragrance ingredients in entirely aqueous systems, and have demonstrated technical benefits from salting out (i.e. producing shifts in Setschenow constants). However, to the best of our knowledge, this has not been applied to complex systems such as shampoos and has not been empirically demonstrated using sensory testing. It is well known that electrically-charged species such as inorganic salts can be used to "salt out" organic compounds from liquid solvents, particularly water, by making these compounds less soluble in the liquid matrix. Technologies of this kind have been successfully applied across multiple disciplines, including extracting organic contaminants from ocean

water. Sodium chloride is often used as a thickening agent in shampoo-based products, and its presence is likely to contribute to an unintentional salting out effect. It is possible that the addition of other inorganic salts or higher salt concentrations, into consumer goods products could further increase this effect. This approach though presents several disadvantages. Firstly, salts are unlikely to be soluble to any extent in fragrance oils, and so would have to be added to base at the end of the production process. Secondly, the concentrations of salt required to produce such an effect are likely to be far higher. Further, the presence of salts is unlikely to provide benefits, such as competitive micellisation processes with fragrance ingredients, and therefore precludes a potential and different route for contributing to the enhancement effect.

It is an objective of the present invention to provide a user with an enhanced fragrance effect by modulating the overall perceived fragrance intensity, immediately after use of a fragrance composition or consumer product, preferably within 5 seconds and even more preferably within 60 seconds during a typical consumer use scenario. In yet another objective, the present invention tries to address the inherent liquid-to-gas mass transfer inefficiency of fragrance ingredients; allowing more fragrance ingredients (specifically a greater molar fraction) to enter the vapor phase per unit time and thereby enhancing the sensory perception of said ingredients. More specifically, within the first 60 seconds following contact with a diluent, a greater molar fraction of fragrance ingredients should enter the vapor phase. This approach in turn can reduce the required dosage or added levels of fragrance ingredients in the fragrance composition and thereby the final consumer product and save costs.

SUMMARY OF THE INVENTION

In addressing the deficiencies in the prior art the applicant surprisingly found that the sensory perception of fragrance ingredients in fragrance compositions or fully-formulated, especially surfactant-containing, consumer products can be enhanced by dosing or adding at least one amylopectin-based material into the fragrance composition or consumer product at an effective amount. The presence of the amylopectin-based material within fragrance compositions or consumer product has been empirically demonstrated to increase or enhance overall perceived fragrance intensity (“PFI”) immediately after contact with a diluent, preferably 5 seconds after said contact, even more preferably within 60 seconds after said contact, wherein the diluent comprises water.

Additionally, amylopectin-based materials are naturally produced, have a very low carbon footprint, are ubiquitously sourced, and are substantially cheaper than the fragrance ingredients that they are enhancing the performance of.

In a first aspect, the present invention relates to a fragrance composition or consumer product comprising or consisting of: a) at least one fragrance ingredient; and b) at least one amylopectin-based material.

In another aspect, the present invention relates to a method of enhancing or improving the overall perceived fragrance intensity of a fragrance composition or a consumer product, described herein, upon bringing the fragrance composition or consumer product in contact with a diluent, the method comprising the steps of: a) providing at least one amylopectin-based material; and b) adding to the fragrance composition or consumer product an effective amount of the at least one amylopectin-based material.

In a final aspect, the present invention also relates to the use of an amylopectin-based material for enhancing the overall perceived fragrance intensity of a fragrance composition or a consumer product, described herein, upon bringing the fragrance composition or the consumer product in contact with a diluent, wherein the amylopectin-based material is added to the fragrance composition or the consumer product prior to bringing it in contact with the diluent.

The present invention offers primarily an enhanced consumer experience, which presents itself as an increased overall perceived fragrance intensity ("PFI") when the technology is introduced into a fragrance composition or a consumer product.

The present invention additionally provides the possibility that the inclusion of the amylopectin-based material in a fragrance composition or directly in the consumer product modulates the inherent liquid-gas mass transfer inefficiencies of fragrance ingredients; allowing more fragrance ingredients (specifically a greater molar fraction) to enter the vapour phase per unit time. The enhanced mass transfer efficiency of fragrance ingredients offers the potential to provide lower dosage levels of fragrance into the consumer product, thereby saving costs whilst not necessarily impacting on the olfactory experience of the fragrance composition or consumer product.

DETAILED DESCRIPTION OF THE INVENTION

The fragrance composition or the consumer product, as described herein, comprises or consists of: a) at least one fragrance ingredient.

In preferred embodiments, the fragrance composition comprises more than one fragrance ingredient. The eventual number of individual fragrance ingredients to be included is well within the ability of a skilled perfumer, depending on the type of the fragrance composition desired. The fragrance ingredients used in the fragrance composition may be those generally known in the art to provide specific type of odour or fragrance notes.

In one embodiment of the present invention, fragrance ingredients that possess a citrus / aldehydic odour may be selected from ingredients such as, but not limited to, decanal (for example ALDEHYDE C 10 DECYLIC), (E)-dec-4-enal (for example DECENAL-4-TRANS), 3,7-dimethyloct-6-enal (for example CITRONELLAL), 1-phenylethanethiol (for example ANJERUK), 6,6-dimethoxy-2,5,5-trimethylhex-2-ene (for example METHYL PAMPLEMOUSSE), nonanal (for example ALDEHYDE C 9 NONYLIC), 4,7-dimethyloct-6-en-3-one (for example DIMETHYL OCTENONE), octanal (for example ALDEHYDE C 8 OCTYLIC), 3,5,5-trimethylhexanal (for example ALDEHYDE C 9 ISONONYLIC), 1-methyl-4-(prop-1-en-2-yl)cyclohex-1-ene (for example DIPENTENE, LIMONENE), 1-methyl-4-(propan-2-ylidene)cyclohex-1-ene (for example TERPINOLENE), heptanal (for example ALDEHYDE C 7 HEPTYLIC); and mixtures thereof.

In another embodiment of the present invention, fragrance ingredients that possess a green odour may be selected from the ingredients such as, but not limited to, (3E,5Z)-undeca-1,3,5-triene (for example UNDECATRIENE), (2E,6Z)-nona-2,6-dienal (for example NONADIENAL); 2,4-dimethylcyclohex-3-enecarbaldehyde (for example TRICYCLAL), 4-vinylcyclohex-1-enecarbaldehyde (for example SHISOLIA), 2,4-dimethylcyclohex-3-enecarbaldehyde (for example CYCLAL C), 4-methyl-2-(2-methylprop-1-en-1-yl)tetrahydro-2H-pyran (for example ROSE OXIDE CO), (Z)-hex-3-en-1-ol (for example

HEXENOL-3-CIS), 7-methyl-3-methyleneocta-1,6-diene (for example MYRCENE), hexan-1-ol (for example ALDEHYDE C 6 HEXYLIC); and mixtures thereof.

In another embodiment of the present invention, fragrance ingredients that possess a herbal/aromatic odour may be selected from ingredients such as, but not limited to, 3,7-dimethylocta-1,6-dien-3-yl acetate (for example LINALYL ACETATE), (2S,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-yl acetate (for example BORNYL ACETATE), 2-(sec-butyl)cyclohexanone (for example FRESKOMENTHE), (1S,2R,4R)-1,3,3-trimethylbicyclo[2.2.1]heptan-2-ol (for example FENCHYL ALCOHOL), 2-isopropyl-5-methylcyclohexanone (for example ISOMENTHONE DL), (2S)-1,3,3-trimethylbicyclo[2.2.1]heptan-2-yl acetate (for example FENCHYL ACETATE), 2,6-dimethyloct-7-en-2-ol (for example DIMYRCETOL), (1S,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-one (for example CAMPHOR), 2-isopropyl-5-methylcyclohexanone (for example MENTHONE), 1-methyl-4-propan-2-ylcyclohexa-1,4-diene (for example TERPINENE GAMMA), 1-methyl-4-propan-2-ylbenzene (for example CYMENE PARA), (1s,4s)-1,3,3-trimethyl-2-oxabicyclo[2.2.2]octane (for example EUCALYPTOL), 2,2,6-trimethyl-6-vinyltetrahydro-2H-pyran (for example LIMETOL), 6,6-dimethyl-2-methylenebicyclo[3.1.1]heptane (for example PINENE BETA), 2,6,6-trimethylbicyclo[3.1.1]hept-2-ene (for example PINENE ALPHA); and mixtures thereof.

Other fragrance ingredients may be selected from, but not limited to, 2-phenyl-ethanal (for example PHENYL ACETALDEHYDE), propyl (2S)-2-[(2-methyl-2-butanyl)oxy]propanoate (for example SCLAREOLATE), 5-methyl-2-(prop-1-en-2-yl)cyclohexanol (for example ISOPULEGOL); ethyl benzoate; such as 2-methyl-5-propan-2-ylcyclohexa-1,3-diene (for example PHELLANDRENE), octan-2-one (for example METHYL HEXYL KETONE), 2-ethyl-4-methyl-1,3-thiazole (for example METHYL ISOPROPYL THIAZOL), octan-3-one (for example ETHYL AMYL KETONE); and mixtures thereof.

In another embodiment of the present invention, fragrance ingredients that possess a ambery/woody odour may be selected from ingredients such as, but not limited to, methyl 2,4-dihydroxy-3,6-dimethylbenzoate (for example EVERNYL), 3,8,8,11a-tetramethyldodecahydro-1H-3,5a-epoxynaphtho[2,1-c]oxepine (for example AMBERKETAL), 3-((1R,2S,4R,6R)-5,5,6-trimethylbicyclo[2.2.1]heptan-2-yl)cyclohexanol (for example SANDELA CONCENTRATED), 2-(2-(3,3,5-trimethylcyclohexyl)acetyl)cyclopentanone (for example DIONE), (4aR,5R,7aS,9R)-Octahydro-2,2,5,8,8,9a-hexamethyl-4H-4a,9-methanoazuleno[5,6-d]-1,3-dioxole (for example AMBROCENIDE), 5-(sec-butyl)-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane (for example KARANAL), 2,4-dimethyl-2-(5,5,8,8-tetramethyl-5,6,7,8-tetrahydronaphthalen-2-yl)-1,3-dioxolane (for example OKOUMAL), (1-methyl-2-((1,2,2-trimethylbicyclo[3.1.0]hexan-3-yl)methyl)cyclopropyl)methanol (for example JAVANOL), ((1S,8aR)-1,4,4-trimethyl-2,3,3a,4,5,8-hexahydro-1H-5,8a-methanoazulen-6-yl)methanol (for example CEDRENOL), 1-((1S,8aS)-1,4,4,6-tetramethyl-2,3,3a,4,5,8-hexahydro-1H-5,8a-methanoazulen-7-yl)ethanone (for example METHYL CEDRYL KETONE), 1-((1S,8aS)-1,4,4,6-tetramethyl-2,3,3a,4,5,8-hexahydro-1H-5,8a-methanoazulen-7-yl)ethanone (for example VERTOFIX COEUR), 1-(2,2,6-trimethylcyclohexyl)hexan-3-ol (for example TIMBEROL), (7,7,8,8-tetramethyloctahydro-2,3b-methanocyclopenta[1,3]cyclopropa[1,2]benzen-4-yl)methyl acetate (for example AMBORYL ACETATE), (E)-2-ethyl-4-(2,2,3-trimethylcyclopent-3-en-1-yl)but-2-en-1-ol (for example RADJANOL), (1S,6R,8aR)-1,4,4,6-tetramethyloctahydro-1H-5,8a-methanoazulen-6-yl acetate (for example CEDRYL ACETATE CRYSTALS), 3a-ethyl-6,6,9a-trimethyldodecahydronaphtho[1,2-c]furan (for example GRISALVA), 2-(3,8-dimethyl-1,2,3,4,5,6,7,8-octahydroazulen-5-yl)propan-2-yl acetate (for

example GUAIYL ACETATE), 3-methoxy-5-methylphenol (for example ORCINYL 3), (1-methyl-2-(((1R,3R)-2,2,3-trimethylcyclopentyl)methyl)cyclopropyl)methanol (for example PASHMINOL), (E)-2-methyl-4-(2,2,3-trimethyl-1-cyclopent-3-enyl)but-2-en-1-ol (for example SANTACORE), 3-methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pentan-2-ol (for example SANDALORE), (4Z,8Z)-1,5,9-trimethyl-13-oxabicyclo[10.1.0]trideca-4,8-diene (for example CEDROXYDE), (ethoxymethoxy)cyclododecane (for example BOISAMBRENE FORTE), 4,8a,9,9-tetramethyldecahydro-1,6-methanonaphthalen-1-ol (for example PATCHOULI ALCOHOL), (E)-2-methyl-4-(2,2,3-trimethyl-1-cyclopent-3-enyl)but-2-en-1-ol (for example BRAHMANOL F), 1-(2,3,8,8-tetramethyl-1,2,3,4,5,6,7,8-octahydronaphthalen-2-yl)ethanone (for example ISOCYCLEMONE E), 1-(2,3,8,8-tetramethyl-1,2,3,4,5,6,7,8-octahydronaphthalen-2-yl)ethanone (for example ISO E SUPER), 1-(1,2,8,8-tetramethyl-1,2,3,4,5,6,7,8-octahydronaphthalen-2-yl)ethanone (for example GEORGYWOOD), N-ethyl-N-(m-tolyl)propionamide (for example AGARBOIS), 2,4a,5,8a-tetramethyl-1,2,3,4,4a,7,8,8a-octahydronaphthalen-1-yl formate (for example OXYOCTALINE FORMATE), (E)-3-methyl-5-(2,2,3-trimethylcyclopent-3-en-1-yl)pent-4-en-2-ol (for example EBANOL), (E)-3,3-dimethyl-5-(2,2,3-trimethyl-3-cyclopenten-1-yl)-4-penten-2-ol (for example POLYSANTOL), 1-((2-(tert-butyl)cyclohexyl)oxy)butan-2-ol (for example AMBER CORE), 7-methoxy-3,7-dimethyloctan-2-ol (for example OSYROL), (1R,2S,4R)-2'-isopropyl-1,7,7-trimethylspiro[bicyclo[2.2.1]heptane-2,4'-[1,3]dioxane] (for example BELAMBRE), (1R,6S,8aS)-6-methoxy-1,4,4,6-tetramethyloctahydro-1H-5,8a-methanoazulene (for example CEDRYL METHYL ETHER), (Z)-1-(cyclooct-3-en-1-yl)propan-1-ol (for example FLORYMOSS), 2',2',3,7,7-pentamethylspiro[bicyclo[4.1.0]heptane-2,5'-[1,3]dioxane] (for example SPIRAMBRENE), 4-(1-ethoxyvinyl)-3,3,5,5-tetramethylcyclohexanone (for example KEPHALIS), (1S,2R,5R)-2-ethoxy-2,6,6-trimethyl-9-methylenebicyclo[3.3.1]nonane (for example BOISIRIS), 2-(tert-pentyl)cyclohexyl acetate (for example CONIFERAN), 2-(sec-butyl)-1-methylcyclohexyl acetate (for example METAMBRATE), 4-(tert-butyl)cyclohexyl acetate (for example BUTYL CYCLOHEXYL ACETATE PARA), 2-(4-methylcyclohexyl)propan-2-yl acetate (for example MENTHANYL ACETATE), and mixtures thereof.

In another embodiment of the present invention, fragrance ingredients that possess a FLORAL odour may be selected from the group consisting of FLORAL ingredients such as benzyl 2-hydroxybenzoate (for example BENZYL SALICYLATE), (4E)-9-hydroxy-5,9-dimethyl-4-decenal (for example MAHONIAL), 2-cyclohexylidene-2-phenylacetonitrile (for example PEONILE), 2-hexylcyclopent-2-enone (for example ISOJASMONE T), 1-(2-naphtalenyl)-ethanone (for example ORANGER CRYSTALS), 2,2,2-trichloro-1-phenylethyl acetate (for example ROSACETOL), 3-(benzo[d][1,3]dioxol-5-yl)-2-methylpropanal (for example TROPIONAL), hexyl 2-hydroxybenzoate (for example HEXYL SALICYLATE); (4Z)-hept-4-en-2-yl 2-hydroxybenzoate (for example KARMAFLOR), 3-(4-isobutyl-2-methylphenyl)propanal (for example NYMPHEAL), 3-methyl-5-phenylpentan-1-ol (for example MEFROSOL), (Z)-6-(pent-2-en-1-yl)tetrahydro-2H-pyran-2-one (for example JASMIN LACTONE DELTA), 3-(4-(tert-butyl)phenyl)-2-methylpropanal (for example LILIAL), (E)-3-phenylprop-2-en-1-ol (for example CINNAMIC ALCOHOL), 2-methoxynaphthalene (for example YARA YARA), (4-methoxyphenyl)methanol (for example ANISYL ALCOHOL), 2-ethoxynaphthalene (for example NEROLINE CRYSTALS), 2,2-dimethyl-3-(m-tolyl)propan-1-ol (for example MAJANTOL), 7,9-dimethylspiro[5.5]undecan-3-one (for example DISPIRONE), 3-(4-(tert-butyl)phenyl)propanal (for example BOURGEONAL), (E)-4-((3aS,7aS)-hexahydro-1H-4,7-methanoinden-5(6H)-ylidene)butanal (for example DUPICAL), pentyl 2-

hydroxybenzoate (for example AMYL SALICYLATE), (E)-4-(2,5,6,6-tetramethylcyclohex-2-en-1-yl)but-3-en-2-one (for example IRONE ALPHA); 3-(4-isopropylphenyl)-2-methylpropanal (for example CYCLAMEN ALDEHYDE), 4-(4-methylpent-3-en-1-yl)cyclohex-3-enecarbaldehyde (for example MYRALDENE), dec-9-en-1-ol (for example ROSALVA), (1-methyl-2-(5-methylhex-4-en-2-yl)cyclopropyl)methanol (for example ROSYFOLIA), 3-(3-isopropylphenyl)butanal (for example FLORHYDRAL), 3-phenylpropan-1-ol (for example PHENYL PROPYL ALCOHOL), 2-methyl-4-phenylbutan-2-ol (for example DIMETHYL PHENYL ETHYL CARBINOL), methyl 2-aminobenzoate (for example METHYL ANTHRANILATE), tetrahydro-4-methyl-2-(2-methylpropyl)-2H-pyran-4-ol (for example FLOROSA); 3-(4-ethylphenyl)-2,2-dimethylpropanal (for example FLORALOZONE), methyl 2-(methylamino)benzoate (for example DIMETHYL ANTHRANILATE), (E)-3,7-dimethylocta-2,6-dien-1-ol (for example GERANIOL), (E)-4-(2,6,6-trimethylcyclohex-1-en-1-yl)but-3-en-2-one (for example IONONE BETA), 3,7-dimethyloct-6-en-1-ol (for example CITRONELLOL), 4-(2,6,6-trimethylcyclohex-1-en-1-yl)butan-2-one (for example DIHYDRO IONONE BETA), (E)-3-methyl-4-(2,6,6-trimethylcyclohex-2-en-1-yl)but-3-en-2-one (for example ISORALDEINE 70), 4-cyclohexyl-2-methylbutan-2-ol (for example CORANOL), (Z)-3-methyl-2-(pent-2-en-1-yl)cyclopent-2-enone (for example JASMONE CIS); and mixtures thereof.

Other examples of fragrance ingredients that possess a FLORAL odour may be selected from ingredients such as, but not limited to, benzyl acetate (for example BENZYL ACETATE); methyl 2-hydroxybenzoate (for example METHYL SALICYLATE), 3,7-dimethyloctan-3-ol (for example TETRAHYDRO LINALOOL), (Z)-3,4,5,6,6-pentamethylhept-3-en-2-one (for example KOAVONE), 2,6-dimethyloct-7-en-2-ol (for example DIHYDRO MYRCENOL), 3,7-dimethylocta-1,6-dien-3-ol (for example LINALOOL), 2-(2-hydroxypropan-2-yl)-5-methylcyclohexanol (for example GERANODYLE), 1-phenylethanone (for example ACETOPHENONE), 2,6-dimethylheptan-2-ol (for example DIMETOL), methyl benzoate (for example METHYL BENZOATE), 1-methoxy-4-methylbenzene (for example CRESYL METHYL ETHER PARA); and mixtures thereof.

In another embodiment of the present invention, fragrance ingredients that possess a sweet/spicy odour may be selected from ingredients such as, but not limited to, 3-phenylprop-2-enyl 3-phenylprop-2-enoate (for example CINNAMYL CINNAMATE), 4-formyl-2-methoxyphenyl isobutanoate (for example ISOBUTAVAN), 3-ethoxy-4-hydroxybenzaldehyde (for example ETHYL VANILLIN), 2H-chromen-2-one (for example COUMARIN), 3-hydroxy-2-methyl-4H-pyran-4-one (for example MALTOL), 2-ethyl-3-hydroxy-4H-pyran-4-one (for example ETHYL MALTOL), (E)-2-methoxy-4-(prop-1-en-1-yl)phenol (for example ISOEUGENOL), 4-allyl-2-methoxyphenyl acetate (for example EUGENYL ACETATE), (E)-1,2-dimethoxy-4-(prop-1-en-1-yl)benzene (for example METHYL ISOEUGENOL), octahydro-2H-chromen-2-one (for example BICYCLO NONALACTONE), benzo[d][1,3]dioxole-5-carbaldehyde (for example HELIOTROPINE), 2-methoxy-4-propylphenol (for example DIHYDRO EUGENOL), (E)-3-phenylprop-2-enenitrile (for example CINNAMALVA), 4-allyl-2-methoxyphenol (for example EUGENOL), (2E)-3-phenylprop-2-enal (for example CINNAMIC ALDEHYDE); and mixtures thereof.

In another embodiment of the present invention, fragrance ingredients that possess a musky odour may be selected from ingredients such as, but not limited to, (Z)-cycloheptadec-9-enone (for example CIVETTONE), 1,4-dioxacycloheptadecane-5,17-dione (for example ETHYLENE BRASSYLATE), 1,4-dioxacyclohexadecane-5,16-dione (for example MUSK C14), 4,6,6,7,8,8-hexamethyl-1,3,4,6,7,8-hexahydrocyclopenta[g]isochromene (for example GALAXOLIDE), (Z)-oxacycloheptadec-10-en-2-one (for

example AMBRETTOLIDE), 2-(1-(3,3-dimethylcyclohexyl)ethoxy)-2-methylpropyl cyclopropanecarboxylate (for example SERENOLIDE), 1-oxacycloheptadecan-2-one (for example DIHYDRO AMBRETTOLIDE), (E)-oxacyclohexadec-12-en-2-one (for example HABANOLIDE), (Z)-cyclohexadec-5-enone (for example VELVIONE), cyclopentadecanone (for example MUSK CPD), (Z)-3-methylcyclopentadec-5-enone (for example MUSCENONE), oxacyclohexadecan-2-one (for example THIBETOLIDE), (Z)-3-methylcyclotetradec-5-enone (for example COSMONE), (E)-13-methyloxacyclopentadec-10-en-2-one (for example NIRVANOLIDE), (E)-2-((3,5-dimethylhex-3-en-2-yl)oxy)-2-methylpropyl cyclopropanecarboxylate (for example SYLKOLIDE), 1a,3,3,4,6,6-hexamethyl-1a,2,3,4,5,6,7,7a-octahydronaphtho[2,3-b]oxirene (for example MOXALONE), 1,1,2,3,3-pentamethyl-2,3,6,7-tetrahydro-1H-inden-4(5H)-one (for example CASHMERAN); and mixtures thereof.

In another embodiment of the present invention, fragrance ingredients that possess a FRUITY odour may be selected from the group consisting of FRUITY ingredients such as, but not limited to, 4-(4-hydroxyphenyl)butan-2-one (for example RASPBERRY KETONE), 6-heptyltetrahydro-2H-pyran-2-one (for example DODECALACTONE DELTA), 5-octyloxolan-2-one (for example DODECALACTONE GAMMA), 6-hexyltetrahydro-2H-pyran-2-one (for example UNDECALACTONE DELTA); 6-pentyltetrahydro-2H-pyran-2-one (for example DECALACTONE DELTA), 5-hexyloxolan-2-one (for example DECALACTONE GAMMA), ethyl methyl phenyl glycidate (for example STRAWBERRY), 4-methyl-5-pentyldihydrofuran-2(3H)-one (for example METHYL TUBERATE); ethyl 6-acetoxyhexanoate (for example BERRYFLOR), 5-pentyldihydrofuran-2(3H)-one (for example PRUNOLIDE), 2-methyl-1-phenylpropan-2-yl butanoate (for example DIMETHYL BENZYL CARBINYL BUTYRATE), 6-propyltetrahydro-2H-pyran-2-one (for example OCTALACTONE DELTA), (E)-1-(2,6,6-trimethylcyclohex-1-en-1-yl)but-2-en-1-one (for example DAMASCONE BETA); (E)-1-(2,6,6-trimethylcyclohex-2-en-1-yl)but-2-en-1-one (for example DAMASCONE ALPHA); (E)-1-(2,6,6-trimethylcyclohex-3-en-1-yl)but-2-en-1-one (for example DAMASCONE DELTA); and mixtures thereof.

Other examples of that possess a FRUITY odour may be selected from the group consisting of, but not limited to, allyl heptanoate (for example ALLYL OENANTHATE), (Z)-hex-3-en-1-yl methyl carbonate (for example LIFFAROME), pentyl butanoate (for example AMYL BUTYRATE), 2,6-dimethylhept-5-enal (for example MELONAL), 3-methylbutyl butanoate (for example ISOAMYL BUTYRATE), benzaldehyde, (4S)-4,7,7-trimethyl-6-thiabicyclo[3.2.1]octane (for example CORPS PAMPLEMOUSSE), hexyl acetate (for example ACETATE C 6 HEXYLIC), (Z)-hex-3-en-1-yl acetate (for example HEXENYL-3-CIS ACETATE), 4-methylpent-4-en-2-yl 2-methylpropanoate (for example ISOPENTYRATE), 2-methyl-4-propyl-1,3-oxathiane (for example OXANE), 3-methylbut-2-en-1-yl acetate (for example PRENYL ACETATE), 6-methylheptan-3-one (for example ETHYL ISOAMYL KETONE), ethyl 2-methylpentanoate (for example MANZANATE), heptan-2-one (for example METHYL AMYL KETONE), 3-methylbutyl acetate (for example ISOAMYL ACETATE), ethyl 2-methylbutanoate (for example ETHYL METHYL-2-BUTYRATE), and ethyl butanoate (for example ETHYL BUTYRATE); and mixtures thereof.

Further fragrance ingredients may be selected from, but not limited to, (2E,6Z)-3,7,11-trimethyldodeca-2,6,10-trien-1-ol (for example FARNESOL), 2-phenethyl 2-hydroxybenzoate (for example PHENYL ETHYL SALICYLATE CRYSTALS), (E)-2-benzylideneoctanal (for example ALPHA HEXYL CINNAMIC ALDEHYDE), diphenylmethanone (for example BENZOPHENONE), methyl 3-oxo-2-pentylcyclopentaneacetate (for example HEDIONE), (3E,6E)-2,4,4,7-tetramethylnona-6,8-dien-3-one

oxime (for example LABIENOXIME), 3-(benzo[d][1,3]dioxol-5-yl)-2-methylpropanal (for example TROPIONAL), (E)-tridec-2-enenitrile (for example TRIDECENE-2-NITRILE), 3-(4-methoxyphenyl)-2-methylpropanal (for example FENNALDEHYDE), (E)-6,10-dimethylundeca-5,9-dien-2-yl acetate (for example TANGERINOL), 6-butan-2-yl-quinoline (for example ISOBUTYL QUINOLINE), 2,6,10-trimethylundec-9-enal (for example ADOXAL), 7-methyl-2H-benzo[b][1,4]dioxepin-3(4H)-one (for example CALONE 1951), dodecanenitrile (for example CLONAL), 4,4a,5,9b-tetrahydroindeno[1,2-d][1,3]dioxine (for example INDOFLOR), 2-cyclohexylhepta-1,6-dien-3-one (for example PHARAONE), decan-1-ol (for example ALCOHOL C 10 DECYLIC), 8-(sec-butyl)-5,6,7,8-tetrahydroquinoline (for example BIGARYL), methyl 3-phenylprop-2-enoate (for example METHYL CINNAMATE), (E)-undec-9-enenitrile (for example FLORIDILE), (E)-7,11-dimethyl-3-methylenedodeca-1,6,10-triene (for example FARNESENE), (3aR,6S,7aS)-3a,4,5,6,7,7a-hexahydro-1H-4,7-methanoinden-6-yl propionate (for example FLOROCYCLENE), 4-(tert-butyl)cyclohexanol (for example BUTYL CYCLOHEXANOL PARA), 1-(3,3-dimethylcyclohex-1-en-1-yl)pent-4-en-1-one (for example GALBANONE), dodecanal (for example ALDEHYDE C 12 LAURIC), 2-isopropyl-5-methylphenol (for example THYMOL CRYSTALS), (E)-3-phenylprop-2-en-1-ol (for example CINNAMIC ALCOHOL), allyl 3-cyclohexylpropionate (for example ALLYL CYCLOHEXYL PROPIONATE), diphenylmethane (for example DIPHENYL METHANE), (E)-4-methyldec-3-en-5-ol (for example UNDECAVERTOL); and mixtures thereof.

In another embodiment fragrance ingredients may be selected from ingredients such as, but not limited to, methyl non-2-ynoate (for example METHYL OCTYNE CARBONATE), 2-phenethyl isobutanoate (for example PHENYL ETHYL ISOBUTYRATE), 5-isopropyl-2-methylphenol (for example CARVACROL), (E)-1-methoxy-4-(prop-1-en-1-yl)benzene (for example ANETHOLE), 3,7-dimethyloctan-1-ol (for example PELARGOL), (3aS,4S,7R,7aS)-ethyl octahydro-1H-4,7-methanoindene-3a-carboxylate (for example FRUITATE), (E)-3,7-dimethylocta-2,6-dien-1-yl acetate (for example GERANYL ACETATE), (Z)-3,7-dimethylocta-2,6-dien-1-ol (for example NEROLEX), 3,7-dimethyloct-6-en-1-yl formate (for example CITRONELLYL FORMATE), 2-(2,4-dimethylcyclohexyl)pyridine (for example ZINARINE); oxydibenzene (for example DIPHENYL OXIDE), 2-methylundecanal (for example ALDEHYDE C 12 MNA), bicyclo[2.2.2]oct-5-ene-2-carboxaldehyde (for example MACEAL), (3aR,6S,7aS)-3a,4,5,6,7,7a-hexahydro-1H-4,7-methanoinden-6-yl acetate (for example JASMACYCLENE), (Z)-3,7-dimethylocta-2,6-dien-1-yl acetate (for example NERYL ACETATE), (E)-1-(2,6,6-trimethylcyclohexa-1,3-dien-1-yl)but-2-en-1-one (for example DAMASCENONE), (E)-5-methylheptan-3-one oxime (for example STEMONE), (2-(isopentyloxy)ethyl)benzene (for example ANTHER), 2-(4-methylcyclohex-3-en-1-yl)propan-2-ol (for example LINDENOL), 1-(cyclopropylmethyl)-4-methoxybenzene (for example TOSCANOL), (Z)-4,11,11-trimethyl-8-methylenebicyclo[7.2.0]undec-4-ene (for example CARYOPHYLLENE), 2-phenylethanol (for example PHENYL ETHYL ALCOHOL), 4-phenylbutan-2-one (for example BENZYL ACETONE), 1-(3,3-dimethylcyclohexyl)ethanol (for example CYCLADEMOL), 2-(2-mercaptopropan-2-yl)-5-methylcyclohexanone (for example CORPS CASSIS), 2-(4-methylcyclohex-3-en-1-yl)propan-2-ol (for example TERPINEOL), 2-(tert-pentyl)cyclohexyl acetate (for example CONIFERAN), 2,4,6-trimethyl-4-phenyl-1,3-dioxane (for example FLOROPAL), 3,7-dimethyloct-6-en-1-yl acetate (for example CITRONELLYL ACETATE), 2,4-dimethyl-4-phenyltetrahydrofuran (for example RHUBAFURAN), (E)-undec-9-enal (for example ALDEHYDE ISO C 11), 4-isopropylcyclohexanol (for example FOLROSIA), undecanal (for example ALDEHYDE C 110 UNDECYLIC), undecan-2-one (for example METHYL NONYL

KETONE), 2-methyl-1-phenylpropan-2-yl acetate (for example DIMETHYL BENZYL CARBINYL ACETATE), (1S,2S,4S)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-ol (for example BORNEOL CRYSTALS), 2-phenethyl acetate (for example PHENYL ETHYL ACETATE), 2-(4-methyl-1-cyclohex-3-enyl)propan-2-ol (for example TERPINEOL ALPHA), 4-(tert-butyl)cyclohexyl acetate (for example PARA TERT BUTYL CYCLOHEXYL ACETATE), 2-methyl-1-phenylpropan-2-ol (for example DIMETHYL BENZYL CARBINOL), 3-tert-butyl-cyclohexyl acetate (for example CYPERATE), (E)-3,7-dimethylocta-2,6-dienal (for example CITRAL TECH), 4-isopropylbenzaldehyde (for example CUMINIC ALDEHYDE), phenylmethanol (for example BENZYL ALCOHOL), decanenitrile (for example DECANONITRILE), 3,7-dimethyloct-6-enenitrile (for example CITRONELLYL NITRILE), (E)-3,7-dimethylocta-2,6-dien-1-yl formate (for example GERANYL FORMATE), 2-(4-methylcyclohex-3-en-1-yl)propan-2-yl acetate (for example TERPINYL ACETATE), undec-10-enal (for example ALDEHYDE C 11 UNDECYLENIC), benzyl propionate (for example BENZYL PROPIONATE), p-cresol (for example PARA CRESOL), ethyl 2-hydroxybenzoate (for example ETHYL SALICYLATE), octan-1-ol (for example ALCOHOL C 8 OCTYLIC), 4-(tert-butyl)cyclohexanone (for example PARA TERT BUTYL CYCLOHEXANONE), 2-(tert-butyl)cyclohexanol (for example VERDOL), 3-phenylbutanal (for example TRIFERNAL), (E)-3,7-dimethylnona-1,6-dien-3-ol (for example ETHYL LINALOOL), (2E,6Z)-nona-2,6-dienenitrile (for example VIOLET NITRILE), 2-methyl-5-(prop-1-en-2-yl)cyclohex-2-enone (for example CARVONE LAEVO), allyl 2-(isopentyloxy)acetate (for example ALLYL AMYL GLYCOLATE), 2-methyldecanal (for example ALDEHYDE C 11 MOA), 2-(4-methylcyclohexyl)propan-2-ol (for example DIHYDRO TERPINEOL), 2,6-dimethyloctan-2-ol (for example TETRAHYDRO MYRCENOL), 2-pentylcyclopentanone (for example QUINTONE), 6-methoxy-2,6-dimethylheptanal (for example METHOXY MELONAL), 1-phenylethyl acetate (for example GARDENOL), 2-(4-methylcyclohexyl)propan-2-yl acetate (for example MENTHANYL ACETATE), 1-(p-tolyl)ethanone (for example METHYL ACETOPHENONE), 2-(tert-butyl)cyclohexyl acetate (for example AGRUMEX), ethyl 2-(2-methyl-1,3-dioxolan-2-yl)acetate (for example FRUCTONE), 2-methylpentyl 2-methylpentanoate (for example PERANAT), p-tolyl acetate (for example CRESYL ACETATE PARA); and mixtures thereof.

In another or preferred embodiment, fragrance ingredients may be selected from ingredients such as, but not limited to, (3E,6E)-2,4,4,7-tetramethylnona-6,8-dien-3-one oxime (for example LABIENOXIME), 2,6-dimethylhept-5-enal (Melonal), 8-(sec-butyl)-5,6,7,8-tetrahydroquinoline (for example BIGARYL), ethyl 2-methylbutanoate, ethyl 2-methylpentanoate (Manzanate), orange oil, acetophenone, 3,7-dimethylnon-6-en-1-ol, 2,4-dimethylcyclohex-3-enecarbaldehyde (for example CYCLAL C), 1-(3,3-dimethylcyclohex-1-en-1-yl)pent-4-en-1-one (for example GALBANONE), 3,7-dimethyloct-6-enal (for example CITRONELLAL); and mixtures thereof.

A comprehensive list of perfume ingredients that in accordance with the present invention may be found in the perfumery literature, for example "Perfume & Flavor Chemicals", S. Arctander (Allured Publishing, 1994) or for example http://www.thegoodscentscompany.com/.

The fragrance compositions according to the present invention may be admixed with various additives, such as solvents, antioxidants, stabilizers, solubilizers, chelating agents, dyes, and the like or other standard/suitable materials known in the art. Furthermore, the fragrance composition of the present invention may be provided in an encapsulated or un-encapsulated form, and, if required, may be

combined with other encapsulated fragrance compositions if so desired for use in particular fragranced consumer products. Encapsulated fragrance compositions are described for example in WO2023144286, the contents of which are incorporated herein by reference. In another embodiment, the fragrance compositions according to the present invention may also contain fragrance precursors. Fragrance precursors are a class of low odour molecules which, when exposed to an external trigger such as oxygen, light or water, will release at least one fragrant molecule, such as those described in, but not limited to, WO 2019166315, WO2019166314, WO2007143873, WO2023065200, WO2023067040, the contents of which are incorporated herein by reference.

Solvents include DIPROPYLENE GLYCOL (3-(3-hydroxypropoxy)propan-1-ol); PROPYLENE GLYCOL (propane-1,2-diol); TRIETHYL CITRATE (triethyl 2-hydroxypropane-1,2,3-tricarboxylate); ISOPROPYL MYRISTATE (propan-2-yl tetradecanoate); DIMETHYL ISOSORBIDE (3,6-dimethoxy-2,3,3a,5,6,6a-hexahydrofuro[3,2-b]furan); WATER; ETHANOL; ISOPROPANOL (ethan-1-ol); DIETHYL PHTHALATE (diethyl benzene-1,2-dicarboxylate); DIPROPYLENE GLYCOL DIMETHYL ETHER (1-methoxy-3-(3-methoxypropoxy)propane); DIPROPYLENE GLYCOL METHYL ETHER (3-(3-methoxypropoxy)propan-1-ol); DIPROPYLENE GLYCOL METHYL ETHER ACETATE (1-((1-methoxypropan-2-yl)oxy)propan-2-yl acetate); DIPROPYLENE GLYCOL n-BUTYL ETHER (1-((1-butoxypropan-2-yl)oxy)propan-2-ol); PROPYLENE GLYCOL METHYL ETHER (1-methoxypropan-2-ol); PROPYLENE GLYCOL n-BUTYL ETHER (1-butoxypropan-2-ol); PROPYLENE GLYCOL n-PROPYL ETHER (1-propoxypropan-2-ol); TRIPROPYLENE GLYCOL METHYL ETHER (1-((1-((1-methoxypropan-2-yl)oxy)propan-2-yl)oxy)propan-2-ol); DIPROPYLENE GLYCOL DIMETHYL ETHER (2-methoxy-1-((1-methoxypropan-2-yl)oxy)propane); ISOPARAFFINIC HYDROCARBON OILS, such as C8-C9 Isoparaffin, C8-C12 Isoparaffin, C10-11 Isoparaffin , C10-12 Isoparaffin, C12-C14 Isoparaffin, C11-C16 Isoparaffin, C12-C20 Isoparaffin, and the like; DIMETHYL GLUTARATE; DIMETHYL SUCCINATE; DIMETHYL ADIPATE; ISOPROPYLIDENE GLYCEROL (2,2-dimethyl-1,3-dioxolane-4-methanol); and the like.

Stabilizers include BUTYL HYDROXY TOLUENE (2,6-ditert-butyl-4-methylphenol) and the like.

Solubilizers include surfactants, such as polyethyleneglycol-40 hydrogenated castor oil; alkyldiphenyloxide disulfonate; alkylamide oxide, such as N,N-dimethyldodecan-1-amine oxide; polysorbates, such as 2-[2-[3,4-bis(2-hydroxyethoxy)oxolan-2-yl]-2-(2-hydroxyethoxy)-ethoxy]ethyl dodecanoate; alkyl alcohol ethoxylates, and the like.

The fragrance composition or consumer product, as described herein, comprises or consists of: b) at least one amylopectin-based material. In another embodiment a mixture of the at least one amylopectin-based materials described herein may also be used.

Amylopectin is a major component of starch and is a polysaccharide macromolecule. Starch consists almost entirely of two major polysaccharides, namely amylose and amylopectin. Amylopectin consists of chains of alpha-(1,4)-linked D-glucose residues, which are interconnected through alpha-(1,6)-glycosidic linkages, thus forming branches in the polymers. The branches in amylopectin constitute about 5% of the molecule, which results in a very complex molecular structure. Short chains of amylopectin form double-helices, which crystalize and contribute to the semi-crystalline nature of the starch granules. In most “normal” starch granules, amylopectin constitutes the major component by weight, whereas amylose constitutes 15–30%; however, many exceptions exist. Number of investigations of the unit chain

distribution of amylopectins from different sources have shown that, generally, the macromolecule is composed of two major fractions of chains of α-(1,4)-linked D-glucosyl residues. Long chains (L-chains) of a degree of polymerisation (DP) of approximately >35 interconnect short (S) chains of DP 6–35.

The amylopectin-based material may have a polydispersity index (PDI) of about 5 to about 200, preferably about 50 to about 150. The PDI of the amylopectin-based material may be determined by firstly recording or measuring the molecular weight distribution of the material and then calculating the PDI. Methods for recording the molecular weight are known in the art and include among others analysis by size exclusion/gel permeation chromatography (SEC/GPC). In another embodiment, the amylopectin-based material may also have a PDI of ≥ 1, or between about 1 to about 5 or between about 2 to about 5, or even between about 1 to about 200, preferably about 1 to about 150.

In one or preferred embodiment, the amylopectin-based material may have an amylopectin content of at least about 90 %, preferably about 95 %, even more preferably at least about 98 % or even at least about 99 %. In another or preferred embodiment, the amylopectin-based material may have an amylopectin content between about 99 % to about 99.9%. The amylopectin-content may be determined by analyzing for the amylose-content in the material. The amylose-content may be determined exemplarily by HPLC pulsed amperometric detection (HPLC-PAD) and/or by spectrophotometric testing using an iodine colorimetric assay (ISO 6647). Alternatively, amylopectin-content may also be determined by, among others, X-ray diffraction, gravimetry or spectrophotometric methods known in the art.

In another or preferred embodiment, the amylopectin-based material may be admixed or solubilized in a suitable solvent. Such suitable solvent may be, without being limited to, water, triethyl citrate, manzanate (ethyl 2-methylpentanoate), diethyl phthalate, benzyl benzoate, isopropylidene glycerol, triacetin, tripropylene glycol methyl ether, glycolic acid, citric acid, hydroxycapric acid, hyaluroinic acid, benzoic acid, methyl cyclopentenolone, isopropyl myristate, isopropyl alcohol, 3-methoxy-3-methyl-1-butanol, phenyl ethyl alcohol, benzyl alcohol, triethanol amine, ethylene brassylate, Dowanol, lactic acid, sodium adipate, triethylene glycol, polyethylene glycol 400, diisooctyl adipate, n-dodecane, dimethyl succinate, ethylene glycol, or aqueous mixtures thereof, preferably lactic acid, glycolic acid, citric acid, hydroxycapric acid, hyaluronic acid, benzoic acid, methyl cyclopentenolone or aqueous mixtures thereof.

The amylopectin-based material may have an alpha-(1,6)-glycosidic bond branching ratio from about 15 to about 40, preferably from about 15 to about 30. The bond branching ratio is defined as the ratio between the alpha-(1,4)-glycosidic bonds to the alpha-(1,6)-glycosidic bonds. The level of alpha-(1,6)-glyosidic bonds may be determined by measuring the difference in the amount of reducing ends before and after enzymatic debranching of the amylopectin containing starch using isoamylase (see for example Y. Takeda et al., Carbohydr. Res. 1993, 240, 253- 263). Alternatively, the bond branching ratio may also be determined by a suitable method involving dissolution in dimethylsulfoxide (DMSO) and then analysis by 1H nuclear magnetic resonance (NMR) technique.

Waxy starches are so named because of the waxy appearance of the endosperm in waxy cereals, contain no or very little amylose. Waxy starches are predominantly composed of amylopectin, the amylopectin-content being > 95 %, preferably > 99 wt.% of the waxy starch. The non-amylopectin based components of the waxy maize starches may be among others amylose, amino acids, lipids, volatile organic components or mixtures thereof. The waxy starches may be selected form the groups consisting of waxy maize starch, waxy corn starch, waxy tapioca starch, waxy rice starch or mixtures thereof.

In a preferred embodiment, the amylopectin-based material is derived from naturally-occurring or synthetic starches, preferably waxy-maize starches.

Examples of commercially available suitable amylopectin-based materials may be, among others, WAXY N-200 from Roquette (waxy corn starch), Pure Source Nutrition (waxy maize starch), Novation Prima 300® from Ingredion (waxy maize starch).

The fragrance composition may contain the at least one amylopectin-based material at a concentration of at least 0.001 % w/w, preferably from about 0.03 % w/w to about 50.00 % w/w, even more preferably from about 0.03 % w/w to about 20.00 % w/w, based on 100 % of the fragrance composition. Thus, the amylopectin-based material is added to 100 parts of the fragrance composition.

In another embodiment, the amylopectin-based material is added at a concentration of about 0.001 % w/w to about 10 % w/w, preferably from about 0.03 to about 5 % w/w, even more preferably from about 0.03 to about 1 % w/w, based on 100 % of the fragrance composition.

The fragrance compositions or consumer product, described herein, provide an increased overall perceived fragrance intensity (PFI). The overall PFI is a measure of the perceived fragrance intensity as rated by a panel of trained or untrained assessors under controlled and/or uncontrolled environments.

The increased overall PFI may be determined by suitable sensory testing techniques, by a trained or untrained sensory panel. A trained sensory panel is developed on the basis of olfactory sensory acuity of the panel members, who then have been trained. The training enables them to identify individual odour characteristics of the fragrance composition or consumer product and score the overall PFI against given standards in a consistent manner. On the other hand, untrained assessors have not undergone any specific fragrance assessment training.

Based on the sensory testing protocol (as described in the example section), the overall PFI can be calculated. The overall PFI may be determined as the difference in the perceived intensity of the at least one fragrance ingredient present in the fragrance composition or the consumer product, said composition or product containing or not at least one amylopectin-based material. After performing the sensory testing protocol, if a statistically-significant difference is observed between samples containing the amylopectin-based material compared to those not containing said material, said fragrance composition or consumer product can be said to provide an increased overall PFI, at the defined time point.

The increased overall PFI may be determined for a fragrance composition or consumer product immediately after contact with a diluent, wherein the diluent comprises water. Within the context of the present invention, immediately after is defined as the point in time when a user of the fragrance composition or consumer product brings said composition or product in contact with a diluent, e.g. during hand-washing or using a shampoo. Typically, after contact further actions like mixing or rubbing of the diluent and the fragrance composition or consumer product may be performed by a user.

In an embodiment of the invention, immediately after may be defined as around 5 seconds after the diluent makes contact with the fragrance composition or consumer product. In another embodiment, the increased overall PFI may also be determined within around 60 seconds after contact with the diluent. These represent typical real-world use scenarios by a user of the fragrance composition or consumer product.

Without being bound to theory, it is assumed that the addition of the amylopectin-based material potentially alters the nature of the incorporation of fragrance ingredients into the surfactant micelles within the product. This could be due to spatial realignment of the micelles in the presence of amylopectin, and/or the result of competitive micellisation of amylopectin-based material with surfactants, thereby modifying the incorporation of fragrance ingredients within the micelle core.

In another embodiment, the present invention relates to a fragrance composition or consumer product comprising or consisting of: a) at least one fragrance ingredient; and b) at least one amylopectin-based material, wherein the fragrance composition or consumer product containing the at least one amylopectin-based material exhibits an increased liquid-to-gas concentration (i.e. headspace concentration) of the at least one fragrance ingredient, compared to the same fragrance composition or consumer product not containing said at least one amylopectin-based material. The liquid-to-gas concentration, described herein, denotes the measured or determined concentration of the at least one (volatile) fragrance ingredient in the headspace, when the fragrance composition or the consumer product is subjected to suitable analytical testing to measure said concentration. The concentration in the headspace, as mentioned herein, may be measured or determined by any suitable analytical technique by a skilled person e.g. gas chromatography coupled to a flame ionization detector (GC-FID).

Fragrance compositions, described herein, are suitable for use in all manner of (fragranced) consumer products or articles for use in home care, personal care and fabric care, preferably laundry care.

Fragrance compositions are particularly suitable for use in fragranced consumer products or articles for use in home care, personal care (e.g. cosmetics) and fabric care, that are intended to be applied to a substrate, such as hard surfaces, human or animal skin or hair, or fabric, in a wet state (i.e. the personal care product contains water and/or a water-miscible solvent, or a propellant), and which are intended to dry down on the substrate.

The fragrance compositions comprising the amylopectin-based material, described herein, may be used at any suitable level depending on the nature or type of the fragranced consumer product in which they are intended to be incorporated, and the intended use of said consumer product. The fragrance composition is added to a consumer product in a concentration of at least about 0.1 % w/w, preferably from about 1.00 % w/w to about 10.00 % w/w, based on 100% of the consumer product. When the fragrance composition is present in at least 0.1 % w/w in the consumer product, this corresponds to about 0.000001 wt.% of the amylopectin-based material being present in the consumer product, based on the total weight of the consumer product.

In another embodiment, the amylopectin-based material may be directly added to the (fragranced) consumer product. In such a case, the amylopectin-based material is added at a concentration of between about 0.000001% w/w to about 0.01% w/w, preferably from about 0.00003% w/w to about 0.005% w/w, even more preferably from about 0.00003% w/w to about 0.001% w/w, based on 100 parts of the consumer product.

Typical (fragranced) consumer products concerned by the present invention include home care products, such as hard surface cleaners, laundry care detergents, laundry care conditioners, fabric refreshers, personal care cleansing compositions, such as shampoos, bath and shower gels, liquid soaps,

soap bars and the like, personal care conditioning composition, such as hair care conditioners, bath and shower lotions, deodorant compositions, antiperspirant compositions, home care compositions, such as hard surface cleaners, heavy duty detergents, oral care products such as toothpaste, mouth wash, mouth spray, and the like.

In a preferred embodiment, the consumer product is selected from the group consisting of shampoo, shower gel, hand wash, laundry detergent, dish-washing detergent.

In many cases, and especially in the home care categories, laundry care, personal care and, the consumer products concerned by the present invention contain surfactants.

In a preferred embodiment, the consumer product is a surfactant-containing consumer product, preferably selected from the group consisting of a personal care product, a home care product or a laundry care product, even more preferably selected from the group consisting of a shampoo, shower gel, hand wash, laundry detergent, dish-washing detergent.

In a particular embodiment of the present invention there is provided a fragranced consumer product comprising a fragrance composition, described herein, and at least one surfactant, selected from anionic, cationic, amphoteric or non-ionic surfactants. Typical anionic surfactants include but are not limited to sodium lauryl sulfate, sodium laureth sulfate, sodium trideceth sulfate, ammonium lauryl sulphate, ammonium laureth sulphate, potassium laureth sulfate, sodium tridecyl benzene sulfonate, sodium dodecyl benzene sulfonate, sodium xylene sulfonate, monoethanolamine lauryl sulfate, monoethanolamine laureth sulfate, triethanolamine lauryl sulfate, triethanolamine laureth sulfate, lauryl sarcosine, cocoyl sarcosine, sodium lauryl sarcosinate, sodium lauroyl sarcosinate, triethylamine lauryl sulfate, triethylamine laureth sulfate, diethanolamine lauryl sulfate, diethanolamine laureth sulfate, lauric monoglyceride sodium sulfate, ammonium cocoyl sulfate, ammonium lauroyl sulfate, sodium cocoyl sulfate, sodium lauroyl sulfate, sodium cocoyl isethionate, potassium cocoyl sulfate, potassium lauryl sulfate, monoethanolamine cocoyl sulfate, monoetha nolamine lauryl sulfate, triethanolamine lauryl sulfate, sodium hydroxyethyl-2-decyl ether sulfates, sodium methyl-2-hydroxydecyl ether sulfates, sodium hydroxyethyl-2-dodecyl ether sulfates, sodium monoethoxylated lauryl alkyl sulfates, C12 – C18 alkyl sulfonates, ethoxylated or native linear and ramified C12 – C18 alcohol sulfates, ethoxylated or native linear and ramified C12 – C18 alcohol sulfates, and mixtures thereof.

Typical cationic surfactants include but are not limited to quaternary ammonium salts having one or two alkyl chain comprising 10 to 22 carbon atoms, and optionally hydroxyl groups, and two to three alkyl groups having 1 to 4 carbon or hydroxyalkyl or hydroxyl groups, or alkoxy groups, having typically about 1 to about 10 ethylene oxide moieties, and an anion selected from the group of halides, hydroxides, acetates and methylsulfate, such as ditallowalkyldimethyl (or diethyl or dihydroxyethyl) ammonium chloride, ditallowalkyldimethylammonium methyl sulfate, methyl tallowalkyl amido ethyl, ditallowalkyldimethylammonium methyl sulfate, dihexadecylalkyl dimethyl (or diethyl, or dihydroxyethyl) ammonium chloride, dioctadecyl- alkyl dimethylammonium chloride, such as DODMAC (dioctadecyl dimethyl ammonium chloride), and dieicosylalkyl dimethylammonium chloride, ethyl-tallowalkyl imidazolinium methyl sulphate, ditallowalkyldimethylammonium methyl sulfate, methyl tallowalkyl amido ethyl tallowalkyl imidazolinium methyl sulfate, quaternary ammonium salts having one or two acyloxy-alkyl chains, one or two alkyl groups and/or one or two hydroxyalkyl groups, such as so-called esterquat (N-methyl-N,N,bis[2-(C16-C18-acetoxy)ethyl)]-N-(2-hydroxyethyl) ammonium methosulfate), diesterquat

(N,N,N-trimethyl-N-[1,2-di-(C16-C18-acyloxy)propyl ammonium salts), DEEDMAC (N,N-dimethyl-N,N-bis([2-(-[(1-oxooctadecyl)oxy]ethyl) ammonium chloride, HEQ (N,N,N-trimethyl-N-[(Z)-2-hydroxy-3-[(1-oxo-octadec-9-enyl)oxy]] ammonium chloride, TEAQ (diquaternized methylsulfate salt of the reaction product between C10-C20 staturated and unsaturated fatty acids and triethanoloamine), alkylbenzyl dialkyl ammonium chloride, whereas the anion is selected from halides (such as chloride or bromide), hydroxy, ethylsulfate, acetate, carbonate, nitrate, phosphate and methylcarbonate.

Typical cationogenic surfactants include but are not limited to primary, secondary and tertiary amines, and ethoxylated fatty amines, such as lauriminopropyldimethyl amine, lauriminoethyldimethyl amine, myristyl amine, tridecyl amine, N-oleyl-1,3-propane diamine, ethoxylated N-tallow-1,3-propanediamine.

Typical zwitterionic surfactants include but are not limited to derivatives of aliphatic quaternary ammonium, phosphonium, and sulfonium compounds having linear or ramified alkyl, or alkenyl, or hydroxyl alkyl or alkoxy radicals, one of which having from about 8 to about 18 carbon atoms and another of which containing an anionic group selected from carboxyl, sulfonate, sulfate, succinate, phosphate or phosphonate groups. The alkoxy radicals include typically about 1 to about 10 ethylene oxide moieties or about 1 to about 3 glyceryl moieties. The hydroxyl alkyl radicals comprise typically alkylol moieties having 1 to 3 carbon atoms. A particular class of zwitterionic surfactant includes betaines comprising a quaternized cationic ammonium group and an anionic carboxylate group, separated by at least one methylene group, such as coco dimethylcarboxymethyl betaine, lauryl dimethyl carboxymethyl betaine, lauryl dimethyl alpha-carboxyethyl betaine, cetyl dimethyl carboxymethyl betaine, oleyl dimethyl gamma-carboxypropyl betaine, lauryl and stearyl bis-(2-hydroxyethyl) carboxymethyl betaine, oleyl dimethyl gamma-carboxypropyl betaine, and lauryl bis-(2-hydroxypropyl)-alpha-carboxyethyl betaine. Other betaines include amidoalkyl, sulfoalkyl and alkyl amidosufo betaines, wherein the alkyl moiety is typically an ethyl or a propyl moiety, such as cocoamidopropyl betaine, cocodimethylsulfopropyl betaine, lauryl dimethyl sulfoethyl betaine, lauryl bis-(2-hydroxyethyl) sulfopropyl betaine and the like.

Typical amphoteric surfactants include but are not limited to derivatives of primary, secondary and tertiary amines having linear or ramified alkyl or alkenyl radicals, one of which having from about 8 to about 18 carbon atoms and another of which containing an anionic group selected from carboxyl, sulfonate, sulfate, succinate, phosphate or phosphonate groups, such as sodium 3-dodecylimino propionate, sodium 3-dodecyliminopropane sulfonate.

Non-ionic surfactants include but are not limited to C4–C22 alkyl ethoxylates with about 1-25 ethylene oxide units, including the so-called narrow peaked alkyl ethoxylates, particularly ethoxylates and mixed ethoxylates/propoxylates, alkyl dialkyl amine oxides, alkyl polyglycosides, alkanoyl glucose amides, and mixtures thereof. Specific examples of non-ionic surfactants are the condensation products of aliphatic alcohols with from about 1 to about 22 moles of ethylene oxide. The alkyl chain of the aliphatic alcohol can either be straight or branched, primary or secondary, and generally contains from about 8 to about 18 carbon atoms, preferably C8 to C18 (e.g. C10) with 2 to 14 moles of ethylene oxide, such as the condensation product of C11-C15 linear secondary alcohol with 9 moles ethylene oxide, or the condensation product of C12-C14 primary alcohol with 6 moles ethylene oxide, or the condensation product of C14-C15 linear alcohol with 4 moles of ethylene oxide, or the condensation product of C13-C15

alcohol with 9 moles ethylene, or the condensation products of C13 alcohols and 2-21 moles of ethylene oxide. This category of non-ionic surfactant is referred to generally as "alkyl ethoxylates."

Other examples of non-ionic surfactants include the condensation products of ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol (e.g. PPG-1-PEG-9 Lauryl Glycol Ether).

Further examples of non-ionic surfactants are the polyethylene glycol sorbitol ethers containing 3-30 EO units (including, for example, sorbitol esters with oleic, myristic, stearic, palmitic acid, and the like).

Further examples of non-ionic surfactants are the condensation products of ethylene oxide (EO) with the product resulting from the reaction of propylene oxide and ethylene diamine.

Semi-polar non-ionic surfactants are a special category of non-ionic surfactants which include water-soluble amine oxides. These amine oxide surfactants in particular include C10-C18 alkyl dimethyl amine oxides and C8-C12 alkoxy ethyl dihydroxy ethyl amine oxides, such as NN-dihydroxyethyl-N-stearamine oxide, ethoxylated lauramide and lauryldimethylamine oxide.

Other non-ionic surfactants are alkyl polyglycosides including, for example, C8-C10 polyglycosides, such as C12-C16 alkyl polyglycosides, C8-C16 alkyl polyglycosides, C5 Amyl xyloside) and mixture of C5 Amyl, C8 Capryl, C12 Lauryl. The term “alkyl” as used hereinabove for the non-ionic sugar-based surfactant refers to saturated linear alkyl residues having 3 to 21 carbon atoms, including hexyl, octyl, decanyl, dodecanyl, tetradecanyl, hexadecanyl, and octadecanyl.

Further non-ionic surfactants include, for example, PEG 40 or PEG 400 hydrogenated castor oil.

Further non-ionic surfactants include glycerol-based surfactants having alkyl, alkenyl or hydroxyalkenyl residues having 5 to 21 carbon atoms, and different numbers of glyceryl moieties, such as octanoic acid hexaglyceryl ester, decanoic acid tetraglyceryl ester, riccinoleic acid hexaglyceryl ester, cocoic acids tetraglyceryl esters, and mixture thereof.

The fragranced consumer products of the present invention may include acids or bases, or substances providing acidity or alkalinity, also referred to as acidity sources or alkalinity sources. The acids or acidity sources may be inorganic or organic. Inorganic acids and acidity sources may include hydrochloric acid, sulfuric acid, sulfamic acid, phosphoric acids and the like. Organic acids or acidity sources may include benzoic acid, citric acid, malic acid, and the like. The bases or alkalinity sources may also be inorganic or organic. Inorganic bases and alkalinity sources may include sodium hydroxide, ammonia, and salts comprising carbonates, phosphates, and the like.

The fragranced consumer products of the present invention may include builders for reducing water hardness, such as phosphates, polyphosphates, polycarboxylates, sodium citrate, sodium carbonate, sodium silicate, sodium aluminosilicate (zeolite), and the like.

In many cases, the fragranced consumer products of the present invention are liquid and may include further additives, such as solvents, fillers, texturing agents, such as thickener and rheological aids, distributing aids, anti-redeposition agents, preservative agents, deodorizing agents, cosmetic active ingredients, surface enhancing agents,

In a particular embodiment of the present invention there is provided a fragranced consumer product comprising a fragrance composition, as herein described, and at least one solvent selected from water-soluble solvents, or water-insoluble, or partially water-soluble solvents.

Water-soluble co-solvents include, but are not limited to, ethanol, 1-propanol, 2-propanol, 1-butanol, 1,2-propane diol, 1,3-propane diol, 1,2-butanediol, 1,2-pentandiol 1,2-hexanediol, 1,2-heptanediol, 2-methyl-pentan-2,4-diol, carbitol, glycol ethers, such as propylene glycol, dipropylene glycol, 1,3-propanediol, glycol esters and glycol ethers, such as dipropylene glycol methyl ether acetate, dipropylene glycol methyl ether, propylene glycol n-butyl ether, diethylene glycol butyl ether, hexylene glycol, methyl methoxy butanol, (+/-)-2,2-dimethyl-4-hydroxymethyl-1,3-dioxolane, glycerine, dimethyl isosorbide, triethyl citrate and mixtures thereof.

Water-insoluble or partially insoluble solvents include, but are not limited to, isopropyl myristate, methyl myristate, alkyl esters, such as methyl linoleate, methyl palmitate, ethyl laurate, ethyl linoleate, ethyl oleate, ethyl octanoate, dibenzyl ether and diethyl phtalate, dibasic ester DBE (blend composed of diisobutyl glutarate, diisobutyl succinate, and diisobutyl adipate, commercially available from Solvay, or blend composed of diisobutyl glutarate, and diisobutyl adipate, commercially available from Invista, and hydrocarbons.

In a particular embodiment of the present invention there is provided a fragranced consumer product comprising the fragrance composition of the present invention and at least one texturing agent and/or colloid stabilizer, selected from rheology modifiers, thickener, gel-forming agents, thixotropic agents, and dispersing agents.

These texturing agents and/or colloid stabilizers are typically water soluble of partially water soluble, or surface active polymers. These polymers include, but are not limited to quaternized hydroxyethyl cellulose, poly(diallyl ammonium chloride-co-acrylamide), quaternized guar gum, poly(acrylamidopropyltrimethyl amonium chloride-co-acrylamide) copolymers, poly(methacrylamidopropyltrimethyl ammonium chloride), polyethyleneimine, poly[(3-methyl-1-vinylimidazolium methyl sulfate)-co-(1-vinylpyrrolidone, cationic polyamines, cationic polyacrylamide, poly(trimethylaminoethyl methacrylate), , poyl(vinylamine, poly(dimethyldiallyl ammonium chloride), also called poly(DADMAC), chitosan, carboxymethyl cellulose, xanthan gum, acacia gum, ghatti gum, tragaganth gum, Arabic gum, sodium alginate, ethoxylated alginate, gelatine, dextran, hydroxythyl cellulose, hydroxypropyl cellulose, hydroxypropyl methylcellulose, poly(ethylene oxide), poly(ethylene oxide-b-propylene oxide) block-copolymers, polyacrylamide, polyacrylic acid or carbomers, sodium polyacrylate, acrylates copolymer, acrylates crosspolymer-4, acrylates crosspolymer-3, polyacrylate-2 crosspolymer, and polyacrylate-14, crosslinked acrylates/C10-30 alkyl acrylate copolymers, polyvinyl alcohol, polyvinyl pyrrolidone, pectin, and modified.

In a particular embodiment of the present invention is provided a fragranced consumer product, for example a hair care product, comprising the fragrance composition of the present invention and at least one silicone, selected from, but not limited to dimethicone, poly(dimethylsiloxane), amino-silicone, such as amodimethicone, trialkylammonium-silicone salts, ethoxylated silicones and the like.

In a particular embodiment of the present invention is provided a fragranced consumer product comprising the fragrance composition of the present invention and at least one active cosmetic ingredient selected from, but not limited to emollients, moisturizing agents, anti-wrinkle agents, exfoliating agents, sunscreen agents, dyes, pigments, talcum, conditioning agents, hair styling agents, and antidandruff agents.

In a particular embodiment of the present invention is provided a fragranced consumer product comprising a fragrance composition of the present invention and at least one fabric enhancing agent, selected from, but not limited to softening agents, optical brighteners and antistatic agents.

In a particular embodiment of the present invention is provided a fragranced consumer product comprising a fragrance composition of the present invention and at least one preservative selected from, but not limited to butylated hydroxyanisole (BHA), butylated hydroxytoluene (BHT), dilauryl thiodipropionate, alkyl parabene, tocopherols and the like. In another embodiment, a suitable preservative includes a combination of benzisothiazolone (BIT), methylisothiazolone (MIT) and/or laurylamine dipropylenediamine (BDA), and mixtures thereof, and mixtures of NN'-dihydroxymethyl urea and 1,6-dihydroxy-2,5-dioxo-hexane.

In a particular embodiment of the present invention is provided a fragranced consumer product comprising a fragrance composition of the present invention and at least one deodorizing agent selected from, but not limited to zinc derivatives, essential oils, sodium undecylenate, methyl undecylenate, 2-hydroxypropyl beta cyclodextrin, soyethyl morpholinium ethosulfate, crotonates and fumarates, and alkylene carbonates.

In a particular embodiment of the present invention is provided a fragranced consumer product, for example home care products, comprising the fragrance composition of the present invention and at least one solubilized, water soluble uncomplexed cyclodextrin selected from, but not limited to alpha-cyclodextrin, beta-cyclodextrin, gamma cyclodextrin and/or their derivatives, and/or mixture thereof. Cyclodextrin derivatives include, but are not limited to methoxy, ethoxy cyclodextrins, hydroxyl ethyl cyclodextrins, hydroxypropyl cyclodextrins, cationic cyclodextrins, such as 2-hydroxy-3-(trimethylammonium) propyloxy cyclodextrins, anionic cyclodextrins, such as carboxymethyl cyclodextrins and cyclodextrin sulfates and the like.

The present invention also provides a method for enhancing the overall perceived fragrance intensity (PFI) of a fragrance composition or consumer product comprising at least one fragrance ingredient, upon bringing the fragrance composition or consumer product in contact with a diluent, the method comprising the steps of:

a) providing at least one amylopectin-based material; and

b) adding to the fragrance composition or consumer product an effective amount of the at least one amylopectin-based material.

The amylopectin-based material may be added in an effective amount to the fragrance composition or directly to the consumer product. The addition in an effective amount may be understood as the presence of a minimum quantity of the amylopectin-based material necessary to provide an increased overall PFI, as described herein.

In another embodiment, the present invention provides a method, as described herein, wherein the amount of amylopectin-based material added in step b) is at least about 0.001 % w/w, preferably from about 0.03 % w/w to about 20.00 % w/w, based on 100 % (i.e. 100 parts) of the fragrance composition.

Thus, the effective amount of the amylopectin-based material may be at least about 0.001 % w/w, preferably from about 0.03 % w/w to about 20.00 % w/w, based on 100% of the fragrance composition.

Where the amylopectin-based material is directly added to the consumer product, in the method described herein, the amylopectin-based material may be added at a concentration of between about 0.000001% w/w to about 0.01% w/w, preferably from about 0.00003% w/w to about 0.005% w/w, even more preferably from about 0.00003% w/w to about 0.001% w/w, based on 100 parts of the consumer product.

In another embodiment, the present invention relates to a method of increasing liquid-to-gas concentration of at least one fragrance ingredient comprised in a fragrance composition or a consumer product, comprising at least one fragrance ingredient, comprising the steps of: a) providing at least one amylopectin-based material; and b) adding to the fragrance composition or the consumer product an effective amount of the at least one amylopectin-based material. The liquid-to-gas concentration may alternatively also be defined as headspace concentration. Thus, the present invention relates to a method of increasing headspace concentration of at least one fragrance ingredient comprised in a fragrance composition or a consumer product, comprising at least one fragrance ingredient, comprising the steps of: a) providing at least one amylopectin-based material; and b) adding to the fragrance composition or the consumer product an effective amount of the at least one amylopectin-based material.

The addition of the at least one amylopectin-based material to the fragrance composition or the consumer product increases the liquid–to-gas concentration, compared to the same fragrance composition or same consumer product, not containing said at least one amylopectin-based material. The liquid-to-gas concentration, described herein, denotes the measured or determined concentration of the at least one (volatile) fragrance ingredient in the headspace, when the fragrance composition or the consumer product is subjected to suitable analytical testing to measure said concentration. The concentration in the headspace, as mentioned herein, may be measured or determined by any suitable analytical technique by a skilled person e.g. gas chromatography coupled to a flame ionization detector (GC-FID).

In another embodiment, the present invention relates to the use of an amylopectin-based material for enhancing overall perceived intensity of a fragrance composition or of a consumer product, upon bringing the fragrance composition or the consumer product in contact with a diluent, wherein the amylopectin-based material is added to the fragrance composition or the consumer product, prior to bringing it in contact with the diluent.

In order to further illustrate the present invention and the advantages thereof, the following specific examples are provided, it being understood that same are intended only as illustrative and non-limiting.

EXAMPLES

The following examples are given solely for the purpose of illustration and are not to be construed as limitations of the present invention, as many variations of the invention are possible without departing from the spirit and scope of the present disclosure.

Materials

The following amylopectin-based materials were sourced for testing purposes:

- Pure Source Nutrition (waxy maize starch).

Sensory testing

Test 01: controlled environment

For these assessments, a fragrance composition was designed, comprising fragrance ingredients and, if required, other materials. The designed fragrance composition is elaborated in table 01.

Table 01

Material/Fragrance Ingredient	**CAS-Number**	**Amount (% wt.)**
Methyl (4E)-octa-4,7-dienoate	189440-77-5	0.20
Benzyl acetate	140-11-4	6.00
Benzyl 2-hydroxybenzoate	118-58-1	16.00
8-methyl-1,5-benzodioxepin-3-one	28940-11-6	0.20
Ethyl 6,6-dimethyl-2-methylenecyclohex-3-ene-1-carboxylate (Cristalon™)	35044-59-8	0.40
1-(2,6,6-trimethylcyclohex-2-en-1-yl)but-2-enone	43052-87-5	0.40
2,6-Dimethylheptan-2-ol (Dimetol™)	13254-34-7	2.00
Ethyl 2-methylbutanoate	7452-79-1	2.00
Tetrahydro-2-isobutyl-4-methyl pyran-4-ol (Florosa)	63500-71-0	10.00
((Z)-1-(cyclooct-3-en-1-yl)propan-1-ol) (Florymoss)	681433-04-5	0.30
1-(1,2,8,8-tetramethyl-1,3,4,5,6,7-hexahydronaphthalen-2-yl)ethanone (Georgywood)	185429-83-8	2.00
(2E)-3,7-dimethylocta-2,6-dien-1-ol (Geraniol)	106-24-1	6.00
2-Benzylideneoctanal	101-86-0	20.00
2-methoxy-4-(1-methylvinyl)phenol (Isoeugenol)	97-54-1	0.60
[1-Methyl-2-[(1,2,2-trimethylbicyclo[3.1.0]hex-3-yl)methyl]cyclopropyl]methanol (Javanol™)	198404-98-7	0.40
3,7-Dimethylocta-1,6-dien-3-ol (Linalool)	78-70-6	22.36
1,6-octadien-3-ol, 3,7-dimethyl-acetate	115-95-7	4.00
Ethyl 2-methylpentanoate (Manzanate)	39255-32-8	2.00
3-(4-isobutyl-2-methylphenyl)propanal (Nympheal®)	1637294-12-2	1.00
Cyclopropanemethanol, 2-(1,4-dimethyl-3- penten-1-yl)-1-methyl (Rosyfolia®)	1655500-83-6	1.00

3-ethyl-6-ethyl-6-octen-1-ol (Super Muguet)	26330-65-4	1.00
(3'E)-2-((3',5'-dimethylhex-3'-en-2'-yl)oxy) -2-methylpropyl cyclopropanecarboxylate (Sylkolide)	676532-44-8	2.00
1-cyclooct-3-enylethanone (Tanaisone)	32669-00-4	0.10
2-(2,4-dimethyl cyclohexyl) pyridine (Zinarine)	885702-72-7	0.04

The above described fragrance composition was taken as 100 % (or 100 parts) to which 0.03 % of the amylopectin-based material was added. Equal number of fragrance compositions were prepared with ("modified") the above defined amount of amylopectin-based material as well as without ("unmodified").

The "modified" and "unmodified" fragrance compositions were then added (1%) to a commercially available unfragranced shampoo base (Shampoo: Faith-in-Nature®), based on 100% or 100 parts of the unfragranced shampoo base, to provide a "modified" and "unmodified" shampoo composition, respectively. The modified shampoo product thereby contained 0.0003% of the amylopectin-based material.

The prepared samples were tested for overall PFI using a trained sensory panel at Givaudan UK site in Ashford (UK), under controlled experimental conditions. 20 assessors were used in each test to rate the overall PFI of both the modified and unmodified shampoo composition, each in duplicate. Therefore, 40 total assessments were carried out in each test for each of the modified and unmodified shampoo compositions. The assessment was conducted in a small booth (10m³ booths) with the airflow on throughout the test.

In order to control experimental variables of the testing protocol of test 01 and to make the tests closer to a consumer-relevant environment, the protocol of test 01 involved placing the to-be-assessed sample of the modified or unmodified shampoo product (50 g) in a suitable container. Dispensing 450mL of water which had been pre-heated to 37 - 40°C in another glass or plastic bowl. The pre-heated water was then added to the sample and the contents were stirred for a period of 5 seconds. Immediately thereafter, the overall PFI was rated (0 seconds) and then again at 60 seconds, the time being noted by an electronic timer. The panellists were instructed to bend down to assess (from approx. 20cm) the overall PFI of the water dilution from the container. The overall PFI was assessed by the trained sensory panel using a 0-100 linear scale.

The order of samples assessed by the panellists was pre-determined using a balanced randomisation. The products were assessed in a sequential monadic way. The study size (total amount of data will be collected) was determined so that a difference of 10% of the scale could be detected with 95% power (e.g. 10 points on the 0-100 linear scale). The products were assessed in replicate by at least 13 panellists.

The data was analysed using analysis of variance (ANOVA). A 5% significance level (95% confidence level) was used. The ANOVA has product, panellist, and replicate as factors. The estimated product means are reported. It is indicated with letters if the product means are statistically-significantly different from each other: if they are not, then they share the same letter.

A comparison of the overall PFIs at both 0 and 60 seconds after dilution between the unmodified and modified shampoo products, as described herein, enabled the determination of enhancement benefit

i.e. increased overall perceived fragrance intensity when amylopectin-based material was present or not in the shampoo product. The results are elaborated in table 02.

Table 02:

Amylopectin	Shampoo Product	Time (sec)	Overall PFI	Significance of differences*
Pure Source Nutrition	Unmodified	0	45.2	A
	Modified		46.2	A
	Unmodified	60	45.1	A
	Modified		49.8	B

**Where the same letter is shown in the "significance of differences" column there was no statistically-significant difference between the relevant figures.*

Another sensory test was performed using the same protocol and method as test 01 with 0.2% added amylopectin-based material (Pure Source Nutrition) added to the fragrance composition of test 01. The results are presented in table 03.

Table 03:

Amylopectin	Shampoo Product	Time (sec)	Overall PFI	Significance of differences*
Pure Source Nutrition	Unmodified	0	38.6	A
	Modified		41.7	A
	Unmodified	60	39.9	A
	Modified		46.6	B

**Where the same letter is shown in the "significance of differences" column there was no statistically-significant difference between the relevant figures.*

Test 02: uncontrolled environment (consumer testing)

For these assessments, non-trained assessor panels were used. These assessors have not undergone any specific fragrance assessment training. The panel consisted of both male and female assessors. For test 02 a total of 55 assessors, both male and female, were included.

The amylopectin "Pure Source Nutrition" was added at 0.0003% into the commercially available shampoo product (Pantene Active PRO-V Smooth & Sleek Shampoo). Approximately 85 grams of the sample (modified shampoo and unmodified shampoo) was filled into 100ml plastic white pump bottles with 2 ml dosage capacity. Each bottle was weighed before and after testing to ensure the amount of products were used in the test were not significantly different. Each sample was coded with a random code number and fully randomised in test order.

Assessors were asked to conduct the assessment in an odour-neutral room in their house and ensure that a window was opened for the duration of the test. They were asked to place a washing up bowl on a kitchen or bathroom worktop to position between the waist and chest level and to use the same location for both product samples.

The assessors were instructed to follow the below protocol for each test sample:

1. Turn on the hot water tap and run the water until it is hand hot (e.g. usual washing up temperature);

2. Fill the measurement jug with 450 ml of water and pour into the washing up bowl;

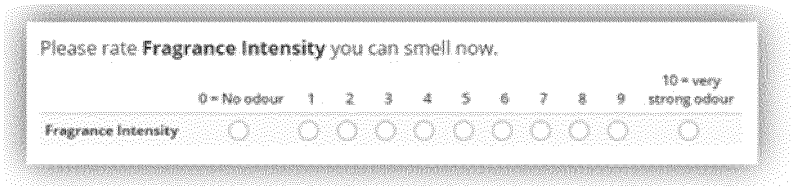
3. Ensure to stand directly over the washing up bowl. Maintain natural standing posture and breathe normally during the test;

4. Press two full pumps of the sample directly into the measured water. A full pump was instructed as pressing the pump down from its resting point until it can no longer be pressed any further. An average of about 1.53 g was dispensed per pump press.

5. Quickly stir the water clockwise 10 times with a gloved hand.

6. Rate perceived fragrance intensity immediately after stirring and 60 seconds after water has been stirred. The timing was noted by a countdown timer on a provided questionnaire.

Assessments were made immediately after stirring and 60 seconds after water had been stirred. The overall perceived intensity was assessed by the non-trained sensory panel using a 0-10 categorical scale where 0 is no odour, and 10 is very strong odour. An example of an assessment screen is shown below:



Assessors were asked to clean up the washing-up bowl after the first test and take 25 minutes break before testing the next one using the same protocol.

Before analysis, the data was checked for outliers (Grubbs Test) and extreme violations to normality. Reliability of the data was checked and data of assessors with poor discrimination, consensus or repeatability, if any, was removed from the analysis.

The data was analysed using analysis of variance (ANOVA). A 5% significance level (95% confidence level) was used. The ANOVA used the unmodified and the modified shampoo products as the qualitative variables. Pairwise comparisons of the products were done using the Benjamini-Hochberg correction for multiple testing. The estimated product means are reported. It is indicated with letters if the product means are statistically significantly different from each other: if they are not, then they share the same letter. The results are elaborated in table 04.

Table 04:

Amylopectin	Shampoo Product	Time (sec)	Overall PFI	Significance of differences*
Pure Source Nutrition	Unmodified	0	6.0	A
	Modified		6.0	A
	Unmodified	60	4,4	A
	Modified		5.0	B

**Where the same letter is shown in the "significance of differences" column there was no statistically-significant difference between the relevant figures.*

Determination of liquid-to-gas mass transfer

To quantitatively determine the liquid-to-gas mass transfer of fragrance ingredient(s) for a sample containing or not amylopectin-based materials, quantitative analytical tests were undertaken using

modified and unmodified samples, prepared as described for test 01, i.e. the modified fragrance composition containing 0.0003 wt.% of an amylopectin-based material.

Before use, Tenax® TA (poly(2,6-diphenyl-p-phenylene oxide) thermal desorption tubes (Markes International, UK) were conditioned in grade 5.0 N2 for a period of at least 1 hour at 280°C, at a N2 purge flow of 100 ml/min. The purged tubes were run through the GC-FID (Agilent) to confirm that they were contamination-free before use. The function of the Tenax tubes was to trap the headspace volatiles of the fragrance ingredient(s) for a defined and constant gas volume, in order to compare the mass or amount of trapped headspace volatiles between samples containing or not containing the amylopectin-based material.

Quantitative standards of fragrance ingredients were prepared in methyl tert-butyl ether (MTBE from Sigma Aldrich) at liquid concentrations ranging from 5 - 200 ng/µL. 5 µL aliquots of these standards are injected onto the Tenax TA tubes, and quantitatively analysed by GC-FID to enable calibration curves to be generated.

A vessel containing a sample (modified or unmodified, with amylopectin-based material) was positioned below clap-stamp arms. A TD Tenax tube was position between the arms of the clamp stamp and at a height of 115 mm from the meniscus of the sample. To prepare for collecting a sample for analysis, the Tenax TA tubes are uncapped and the distal end of these tubes was attached using a Legris compression fitting to a diaphragm pump (GilAir Plus Air sampling pump, 18V), which samples for a fixed volume of air (i.e. 200 ml/min for a period of 1 minute after water dilution, to therefore enable a sampling volume of 200 ml). 450 ml of water (40°C) was added to the container and the solution was vigorously stirred with a stirring rod for 5 seconds. The pump was enabled active for an exact period of 60 seconds, during which time the Tenax tubes trapped volatile fragrance ingredient(s). Once the sampling was completed, the Tenax tube was resealed and the lid of the sample container was immediately closed thereafter. The entire process was repeated a further 19 times to obtain a total of 20 replicates.

The sealed Tenax tubes containing the collected sample were analysed by GC-FID against the same instrumental parameters that were used to create the calibration curves and subsequent headspace (HS) concentration for each fragrance ingredient are determined. The HS concentration is defined as the combined sum of the mass of the determined fragrance ingredients as collected in the Tenax tubes divided by the total sample air volume. The results are presented in table 05.

Table 05:

Amylopectin-based Material	Mean HS concentration (ng/L)
Pure Source Nutrition	7846.78
Unmodified 01	4021.26
Unmodified 02	3351.39

The HS concentration data demonstrates the influence of the addition of the amylopectin-based material on the HS concentration of the fragrance ingredients. The unmodified samples do not contain any added amylopectin-based material. The HS concentration of the unmodified sample was determined twice to simply ensure that the determined HS concentrations of the unmodified sample were not affected by the general build-up of HS in the ambient laboratory environment.

CLAIMS

1. A fragrance composition or consumer product comprising or consisting of:
   a) at least one fragrance ingredient; and
   b) at least one amylopectin-based material.

2. The fragrance composition or consumer product according to claim 1, wherein said composition provides an increased overall perceived fragrance intensity (PFI).

3. The fragrance composition or consumer product according to claim 2, wherein said composition provides an increased overall perceived fragrance intensity immediately after contact with a diluent, preferably 5 seconds after said contact, even more preferably within 60 seconds after said contact, wherein the diluent comprises water.

4. The fragrance composition according to claims 1 to 3, wherein the at least one amylopectin-based material is present in a concentration of at least 0.001 %, preferably from about 0.03 % to about 50.00 %, even more preferably from about 0.03 % to about 20.00 %, based on the 100 % of the fragrance composition.

5. The fragrance composition or consumer product according to any one of claims 1 to 4, wherein the at least one amylopectin-based material has a polydispersity index (PDI) of about ≥ 1 to about 5 or about 5 to about 200, preferably about 50 to about 150.

6. The fragrance composition or consumer product according to any one of claims 1 to 5, wherein the at least one amylopectin-based material has an alpha-(1,6)-glycosidic bond branching ratio from about 15 to about 30, preferably from about 20 to about 30 and/or an amylopectin content of at least about 90 %, preferably about 95 %, even more preferably about 98 % or even 99 %.

7. The fragrance composition or consumer product according to any one of claims 1 to 6, wherein the at least one amylopectin-based material is derived from naturally-occurring or synthetic starches, preferably selected from the group consisting of waxy-maize starch, waxy corn starch, waxy tapioca starch, waxy rice starch or mixtures thereof, even more preferably is a waxy-maize starches.

8. The fragrance composition or consumer product according to any one of claims 1 to 7, wherein the fragrance composition or consumer product containing the at least one amylopectin-based material exhibits an increased liquid-to-gas concentration of the at least one fragrance ingredient, compared to the same fragrance composition or consumer product not containing said at least one amylopectin-based material.

9. The consumer product according to claims 1 to 8, wherein the consumer product is a surfactant-containing consumer product, preferably selected from the group consisting of a personal care product, a home care product or a laundry care product, even more preferably selected from the group consisting of a shampoo, shower gel, hand wash, laundry detergent, dish-washing detergent.

10. The consumer product according to claims 1 to 3 or claims 5 to 9, wherein the amylopectin-based material is present in a concentration of between about 0.000001% w/w to about 0.01% w/w, preferably from about 0.00003% w/w to about 0.005% w/w, even more preferably from about 0.00003% w/w to about 0.001% w/w, based on 100 % of the consumer product.

11. A consumer product comprising the fragrance composition according to claims 1 to 8 in a concentration of at least about 0.1 % w/w, preferably from about 1.00 % w/w to about 10.00 % w/w, more preferably from about 0.5 to about 5.00 % w/w, based on 100% of the consumer product.

12. A method for enhancing the overall perceived fragrance intensity of a fragrance composition or consumer product comprising at least one fragrance ingredient, upon bringing the fragrance composition or consumer product in contact with a diluent, the method comprising the steps of:

a) providing at least one amylopectin-based material; and

b) adding to the fragrance composition or the consumer product an effective amount of the at least one amylopectin-based material.

13. The method according to claim 12, wherein the at least one amylopectin-based material is added at a concentration of least about 0.001 %, preferably from about 0.03 % to about 20.00 %, based on 100 % of the fragrance composition.

14. A method of increasing liquid-to-gas concentration of at least one fragrance ingredient comprised in a fragrance composition or a consumer product, comprising the steps of:

a) providing at least one amylopectin-based material; and

b) adding to the fragrance composition or the consumer product an effective amount of the at least one amylopectin-based material.

15. Use of an amylopectin-based material for enhancing overall perceived intensity of a fragrance composition or of a consumer product comprising at least one fragrance ingredient, upon bringing the fragrance composition or the consumer product in contact with a diluent, wherein the amylopectin-based material is added to the fragrance composition or the consumer product, prior to bringing it in contact with the diluent.