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(54) **CONSUMABLE FOR AN AEROSOLISABLE FORMULATION**

(57) The present disclosure relates to a consumable for an aerosolisable formulation, in particular an aerosolisable formulation suitable for use with an electronic aerosol provision system such as an e-cigarette. The present disclosure also relates to the use of said consumable, containers comprising the formulation, and processes of generating an aerosol using the formulation

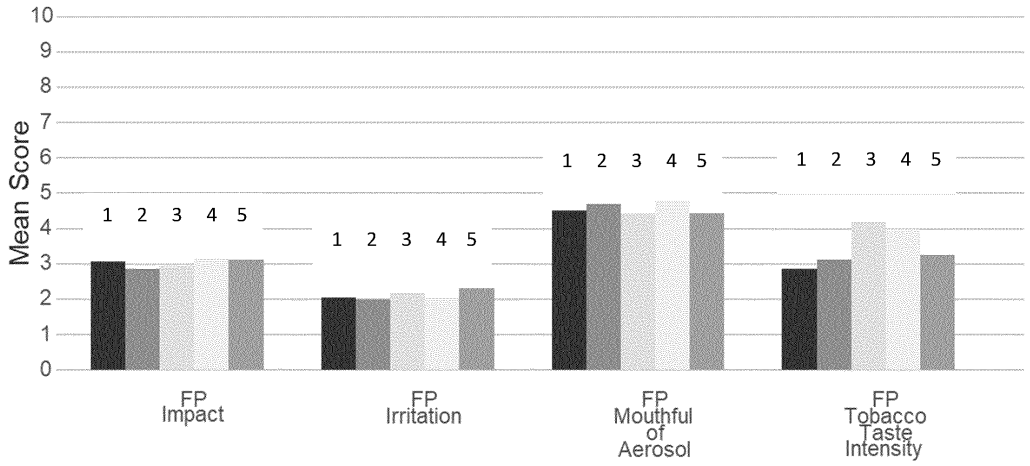


FIG. 2

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Description

FIELD OF THE INVENTION

[0001] The present disclosure relates to a consumable for an aerosolisable formulation, in particular an aerosolisable formulation suitable for use with an electronic aerosol provision system such as an e-cigarette. The present disclosure also relates to the use of said consumable, containers comprising the formulation, and processes of generating an aerosol using the formulation.

BACKGROUND

[0002] Devices have been developed which allow a user to replicate parts of the smoking experience without having to use conventional cigarettes. In particular, devices such as e-cigarettes have been developed which allow a user to generate an artificial aerosol which can then be inhaled to replicate the smoking experience. The aerosol is typically produced by vaporising a liquid which comprises nicotine and an aerosol forming component such as glycerol. The vaporisation occurs via a heater (or other atomization means) which is powered by a power source such as a battery.

[0003] Other devices are also available which seek to replicate the smoking experience without having to use conventional cigarettes. These devices may be referred to as tobacco heating devices, since they generally have the capacity to heat tobacco but not combust it.

[0004] Collectively, e-cigarettes and tobacco heating devices may be referred to as aerosol delivery devices or aerosol provision systems. However, one potential drawback with such devices or systems, in particular with e-cigarettes, is that they may fail to completely replicate the sensorial experience normally associated with smoking a conventional cigarette which users of conventional cigarettes may find less desirable.

[0005] As a result, it would be desirable to provide means for improving the sensorial experience delivered by aerosol delivery devices/aerosol provision systems so that it more closely replicates the cigarette smoking sensorial experience. This may be achieved by improving one or more of the sensory properties of the aerosolisable formulation in the device so that it replicates smoking a conventional cigarette.

SUMMARY OF THE INVENTION

[0006] In accordance with some embodiments described herein, there is provided a consumable for an aerosolisable formulation, wherein the consumable comprises less than about 1 wt% of an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof; and at least two further compounds selected from substituted pyrroles, substituted furans, substituted furanones, substituted pyridines, substituted pyrazines, rose ketones, acyclic monoterpenoids, and trisulfides, wherein the total amount of the at least two further compounds is less than about 5 wt%.

[0007] The consumable may comprise an aerosol former material, optionally wherein the aerosol former material is present in an amount of at least about 70 wt%, based on the total weight of the consumable. The total weight of the at least two further compounds in the consumable may be about 0.0001 wt% to about 5 wt%, based on the total weight of the consumable, optionally about 0.001 wt% to about 1 wt%, based on the total weight of the consumable.

[0008] The aliphatic and/or alkoxy phenol may be selected from alkyl phenols, alkoxy phenols, and alkyl alkyoxyphenols, such as 4-propylphenol, 3-ethylphenol, 2,6-dimethoxyphenol, and 4-ethyl-2-methoxyphenol. The aliphatic aldehyde may be an alkyl aldehyde, such as 3-methylbutanal. The at least two further compounds may be selected from aromatic substituted pyrroles, thiol substituted furans, hydroxyl-substituted furanones, aliphatic substituted pyridines, aliphatic substituted pyrazines, damascones, damascenones, hydroxyl-containing acyclic monoterpenoids, and alkyl trisulfides, such as indole, 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, beta-damascone, geraniol, and dimethyl trisulphide.

[0009] In some embodiments, the at least two further compounds may be selected from indole, 2-furfurylthiol, 2-ethyl-3,5-dimethylpyrazine, furaneol, sotolone, and 2,4-dimethylpyridine, optionally wherein the consumable further comprises the aliphatic and/or alkoxy phenols, such as 4-propylphenol, 3-ethylphenol, 4-ethyl-2-methoxyphenol, or a combination thereof.

[0010] In some embodiments, the consumable may comprise the aliphatic phenol, such as 4-propylphenol, the aliphatic alkoxy phenol, such as 4-ethyl-2-methoxyphenol, and the at least two further compounds may be selected from indole, 2-furfurfylthiol, sotolone, 2,-dimethylpyridine, and 2-ethyl-3,5-dimethylpyrazine, such as wherein the at least two further compounds may be indole, and 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, or 2-ethyl,3-5-dimethylpyrazine.

[0011] In some embodiments, the consumable may comprise the aliphatic phenol such as 3-ethylphenol, and the at least two further compounds may be selected from 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, and beta-damascone, such as wherein the at least two further compounds include sotolone, and a compound selected from 2-furfurylthiol, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, or a combination

thereof. The at least two further compounds may, for instance, comprise: furaneol, 2-ethyl-3,5-dimethylpyrazine, and Sotolone; or 2-furfurylthiol, 2,4-dimethylpyridine, sotolone, and dimethyl trisulphide.

[0012] In some embodiments, the consumable may comprise the aliphatic phenol, such as 3-ethylphenol, and the at least two further compounds may be selected from 2-furfurylthiol, 2,4-dimethylpyridine, and beta-damascone. Alternatively, the consumable may comprise an alkoxyphenol, such as 2,6-dimethoxphenol, and the at least two further compounds may be selected from 2-ethyl-3,5-dimethylpyrazine, dimethyl trisulphide, and geraniol, such as wherein the at least two further compounds are 2-ethyl-3,5-dimethylpyrazine and geraniol, optionally further comprising dimethyl trisulphide

In some embodiments, the consumable may comprise the aliphatic aldehyde, such as 3-methylbutanal, and the at least two further compounds are selected from 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, 2-furfurylthiol, and furaneol, such as wherein the at least two further compounds are furaneol and 2-ethyl-3,5-dimethylpyrazine, optionally further comprising 2,4-dimethylpyridine, 2-furfurylthiol, or a combination thereof.

[0013] In accordance with some embodiments described herein, there is provided an aerosolisable formulation for an aerosol provision system comprising the consumable as defined herein, a carrier or a binder, and optionally nicotine, such as wherein the carrier is present at about 50 wt% or more, based on the total weight of the formulation, or wherein the binder is present and the binder comprises one or more gelling agent(s). The aerosolisable formulation may further include a botanical material.

[0014] In accordance with some embodiments described herein, there is provided an article comprising the aerosolisable formulation as defined herein.

[0015] In accordance with some embodiments described herein, there is provided an aerosol provision system comprising an aerosol provision device and an aerosolisable formulation as defined herein. In accordance with some embodiments described herein, there is provided an aerosol provision system comprising an aerosol provision device and an article as defined herein. The aerosol provision system may be non-combustible as defined herein.

[0016] In accordance with some embodiments described herein, there is provided a process for forming an aerosol, the process comprising providing the aerosolisable formulation as defined herein and aerosolising the formulation. In accordance with some embodiments described herein, there is provided a process for forming an aerosol, the process comprising providing the aerosol provision system as defined herein, and aerosolising the formulation and/or consumable in the system.

[0017] In accordance with some embodiments described herein, there is provided a sealed container containing the article as defined herein, optionally wherein the container is hermetically sealed and is formed from a material which inhibits or prevents the passage of ultraviolet light therethrough.

[0018] In accordance with some embodiments described herein, there is provided the use of a consumable as defined herein, to modify at least one sensory property of an aerosolisable formulation, such as wherein the sensory property is flavour, and the flavour is modified relative to the aerosolisable formulation without the consumable.

[0019] In accordance with some embodiments described herein, there is provided the use of a consumable as defined herein, to modify the tobacco flavour intensity of an aerosolisable formulation.

[0020] These and other features, aspects and advantages of the disclosure will be apparent from the following detailed description and drawings. The invention includes any combination of two, three, four, or more of the above-noted embodiments as well as combinations of any two, three, four, or more features or elements set forth in this disclosure, regardless of whether such features or elements are expressly combined in a specific embodiment description herein. This disclosure is intended to be read holistically such that any separable features or elements of the disclosed invention, in any of its various aspects and embodiments, should be viewed as intended to be combinable unless the context clearly dictates otherwise.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] Having thus described aspects of the disclosure in the foregoing general terms, reference will now be made to the accompanying drawings, which are not necessarily drawn to scale. The drawings are exemplary only and should not be construed as limiting the disclosure.

Figure 1 is a schematic representation of an example aerosol provision system.

Figure 2 is a plot from Experimental 2 showing the sensory test results.

DETAILED DESCRIPTION

[0022] It is to be understood that this invention is not limited to the particular configurations, process steps, and materials disclosed herein as such configurations, process steps, and materials may vary somewhat. It is also to be understood that

the terminology employed herein is used for the purpose of describing particular embodiments only and is not intended to be limiting since the scope of the present invention will be limited only by the appended claims and equivalents thereof.

[0023] As used in this specification and the claims, the singular forms "a," "an," and "the" include plural referents unless the context clearly dictates otherwise. Reference to "dry % by weight" or "dry weight basis" refers to weight on the basis of dry ingredients (i.e., all ingredients except water or carrier). Reference to "wet weight" refers to the weight of the formulation or composition including water or carrier. Unless otherwise indicated, reference to "% by weight" (or "% by weight") of formulation or composition reflects the total wet weight of the formulation or composition (i.e., including water/carrier).

[0024] In this specification, unless otherwise stated, the term "about" modifying the quantity of an ingredient in the formulation of the invention or employed in the methods of the invention refers to variation in the numerical quantity that can occur, for example, through typical measuring and liquid handling procedures used for making concentrates or use solutions in the real world; through inadvertent error in these procedures; through differences in the manufacture, source, or purity of the ingredients employed to make the formulation, or to carry out the methods; and the like. The term "about" also encompasses amounts that differ due to different equilibrium conditions for a formulation or composition resulting from a particular initial mixture. Whether or not modified by the term "about", the claims include equivalents to the quantities.

[0025] As noted in the background above, aerosol provision devices or systems typically allow a user to replicate parts of the smoking experience without having to use conventional combustible tobacco products such as cigarettes. Specifically, aerosol provision systems are intended to produce an aerosol which can be inhaled by the user to replicate the smoking experience. The aerosol produced by such systems does not, however, completely replicate the sensorial experience typically associated with smoking tobacco.

[0026] As will be understood by one skilled in the art, an "aerosolisable formulation" is a formulation that is capable of generating aerosol, for example when heated, irradiated or energized in any other way. An "aerosolisable formulation", namely an aerosol-generating formulation, may, for example, be in the form of a solid, liquid or semi-solid (such as a gel) which may or may not contain an active substance and/or flavourant(s). In preferred embodiments, the aerosolisable formulation is in the form of a liquid or gel.

[0027] The "sensorial gap" between the use of known aerosolisable formulations and smoking combustible tobacco products (e.g. cigarettes) includes the flavour experienced by the consumer. Flavour is the combination of taste, aroma, and chemical sensations, and it has been surprisingly found that the combination of compounds in the present claims is able to modify the flavour of an aerosolisable formulation and thereby reduce this "sensorial gap".

[0028] In vaping, flavour is delivered primarily via aroma. When a user is inhaling aerosol from a tobacco-flavoured formulation (e.g. a tobacco flavoured e-liquid or gel), it is desirable for the aroma to be tobacco-like and for the aroma to deliver a richness and complexity comparable to smoking a cigarette. The consumable of the present disclosure advantageously delivers a specific aroma that is associated with tobacco. The consumable may therefore be described as simulating the aromatic profile of tobacco and/or having a tobacco-like aroma.

[0029] In addition to providing a tobacco-like aroma, the consumable of the present disclosure is able to replicate one or more sensations of smoking a combustible tobacco product. These sensations may include in-smoking experience (e.g. impact) and/or mouthfeel.

[0030] Body of aerosol and mouthfeel are physical sensations experienced in the oral cavity by the user during and after smoking. Smoke, such as cigarette smoke, is typically associated with "fullness" in the mouth and leaves a perceived mouth coating after use. The aftertaste of smoking a cigarette may be described as lingering or indulgent. In the present disclosure the aerosolisable formulation as defined herein provides a body of aerosol and mouthfeel which is comparable to smoking a conventional cigarette. Mouthfeel can also include irritation.

[0031] In-smoking experience includes the desired nicotine sensorials of smoke and the building sensorial sensation puff-by-puff to a level of perceived saturation. Nicotine sensation includes nicotine "hit" (i.e. the physiological response, sometimes referred to as the "buzz") and impact (i.e. where the user experiences irritation and taste) and is an integral part of the smoking experience.

[0032] Surprisingly the consumable of the present disclosure improved the sensorial experience of an aerosolisable formulation when used in an aerosol provision device. Furthermore, the levels of the compounds in the consumable can be adjusted in order to tailor the flavour intensity to consumer preference. This is beneficial because it maximises the switching and appeal of an aerosol provision system as an alternative to cigarettes or other combustible tobacco products. Along with this range of cigarette smoking sensations, the consumable can be combined with a range of flavours and substrates (e.g. e-liquids). The consumable can, for example, be used with a tobacco flavoured e-liquid or equally with a mint/menthol flavoured e-liquid, or any botanical material, e.g. in the form of a gel.

[0033] For ease of reference, these and further aspects of the present invention are now discussed under appropriate section headings. However, the teachings under each section are not necessarily limited to each particular section. In other words, particular sections of the description are not to be read in isolation from other sections.

[0034] The ranges provided herein relate to exemplary amounts of each of the components. Each of these ranges may be taken alone or combined with one or more other component range(s) to provide an embodiment of the invention.

Consumable for an aerosolisable formulation

[0035] There is provided herein a consumable for an aerosolisable formulation, i.e. a consumable suitable for use in an aerosolisable formulation. The consumable may be defined as in Claim 1: the consumable comprises less than about 1 wt% of an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof, and at least two further compounds selected from substituted pyrroles, substituted furans, substituted furanones, substituted pyridines, substituted pyrazines, rose ketones, acyclic monoterpenoids, and trisulfides, wherein the total amount of the at least two further compounds is less than about 5 wt%.

[0036] As described herein, there is also provided a consumable for an aerosolisable formulation, wherein the consumable comprises (a) 4-propylphenol, 3-ethylphenol, 2,6-dimethoxyphenol, or 3-methylbutanal, and (b) at least two further compounds selected from indole, 4-ethyl-2-methoxyphenol, 2-furfurylthiol, beta-damascone, geraniol, and dimethyl trisulphide, wherein the consumable does not include a sweetener.

[0037] There is further provided a consumable for an aerosolisable formulation, wherein the consumable is in the form of a flavour block and comprises (a) at least about 40 wt% of an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof, and (b) 60 wt% or less of at least two further compounds selected from substituted pyrroles, substituted furans, substituted furanones, substituted pyridines, substituted pyrazines, rose ketones, acyclic monoterpenoids, and trisulfides. In such a consumable, the sum of (a) and (b) may equal 100 wt% such that the consumable consists of (a) and (b). In some embodiments the consumable may consist essentially of (a) and (b), where the term "consist essentially of" means that the consumable may include one or more further compounds that did not contribute to the tobacco-like aroma of the consumable.

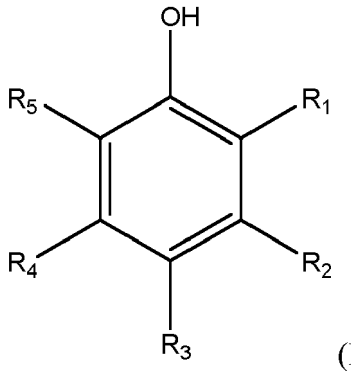
Aliphatic and/or alkoxy phenol

[0038] In some embodiments, the consumable comprises an aliphatic and/or alkoxy phenol, or a combination thereof. The expression 'aliphatic and/or alkoxy phenol' would be readily understood by the person skilled in the art to mean 'aliphatic phenol', 'alkoxy phenol' or 'aliphatic alkoxy phenol', i.e. phenol compounds with aliphatic and/or alkoxy substituents. The term "aliphatic" has its normal meaning in the art, namely acyclic or cyclic, saturated or unsaturated carbon compounds, excluding aromatic compounds. The aliphatic and/or alkoxyphenol may be selected from acyclic and/or alkoxyphenols, such as alkyl, alkenyl and/or alkoxyphenols.

[0039] As used herein, the term "alkyl" includes both saturated straight chain and branched alkyl groups which may be substituted (mono- or poly-) or unsubstituted. In some embodiments the alkyl group is a C_{1-10} alkyl group. In some embodiments the alkyl group is a C_{1-8} alkyl group. In some embodiments the alkyl group is a C_{1-6} alkyl group. In some embodiments the alkyl group is a C_{1-3} alkyl group. In some embodiments the alkyl groups include, for example, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, pentyl and hexyl. In some embodiments the alkyl groups include methyl, ethyl, propyl or isopropyl.

[0040] As used herein, the term "alkenyl" includes both unsaturated straight chain and branched alkenyl groups which may be substituted (mono- or poly-) or unsubstituted. In some embodiments the alkenyl group is a C_{2-10} alkenyl group. In some embodiments the alkenyl group is a C_{2-8} alkenyl group. In some embodiments the alkenyl group is a C_{2-6} alkenyl group. In some embodiments the alkenyl group is a C_{2-3} alkenyl group.

[0041] The aliphatic and/or alkoxy phenol may be represented by a compound of formula (I):



(I)

[0042] Wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen.

[0043] In some embodiments, R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group,

the alkyl, alkenyl and alkoxy group being selected from C_1-C_6 alkyls, C_1-C_6 alkenyls and C_1-C_6 alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen.

[0044] In some embodiments R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, or an alkoxy group, the alkyl and alkoxy group being selected from C_1-C_6 alkyls and C_1-C_6 alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen.

[0045] In some embodiments, the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para- position. In other embodiments, the compound of formula (I) has at least one non-hydrogen substituent at the ortho- or para-position.

[0046] In some embodiments, the aliphatic and/or alkoxyphenol may be selected from alkyl phenols, alkoxyphenols, and alkyl alkoxyphenols, optionally wherein the alkyl groups are C_1-C_{10} alkyls. In some embodiments, the aliphatic and/or alkoxyphenol may be selected from alkyl phenols, alkoxyphenols, and alkyl alkoxyphenols, optionally wherein the alkyl groups are C_1-C_6 alkyls. In some embodiments the alkyl groups include methyl, ethyl, propyl and isopropyl. In some embodiments, the alkyl and/or alkoxy groups are at the meta- or para- position. In other embodiments, the alkyl and/or alkoxy groups are at the ortho- or para- position. Examples include 4-propylphenol, 3-ethylphenol, 2,6-dimethoxyphenol, and 4-ethyl-2-methoxyphenol. The chemical structures of these compounds are shown in Annex 1.

[0047] In some embodiments the consumable includes the aliphatic phenol. The aliphatic phenol may be as defined above, namely an acyclic phenol such as an alkyl or alkenyl phenol. Such a phenol may be represented by formula (I) above, wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen. In some embodiments, the alkyl and alkenyl groups are selected from C_1-C_6 alkyls, and C_1-C_6 alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen. In some embodiments, the compound of formula (I) has at least one non-hydrogen substituent as defined above at the meta- or para- position. Examples include ethyl and phenyl, such as 4-propylphenol and 3-ethylphenol.

[0048] In some embodiments the consumable includes the aliphatic alkoxyphenol. The aliphatic alkoxyphenol may be as defined above, namely an acyclic alkoxyphenol, such as an alkyl or alkenyl alkoxyphenol. Such a phenol may be represented by formula (I) above, wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group. In some embodiments, R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_6 alkyls, C_1-C_6 alkenyls and C_1-C_6 alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group. In some embodiments, the compound of formula (I) has at least one non-hydrogen substituent as defined above at the ortho- or para- position. Examples include ethyl and methoxy, such as 4-ethyl-2-methoxyphenol.

[0049] In some embodiments the consumable includes the alkoxyphenol. Such an alkoxyphenol may be represented by formula (I) above, wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group. In some embodiments, R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen or an alkoxy group, the alkoxy group being selected from C_1-C_6 alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group. In some embodiments, the compound of formula (I) has at least one alkoxy group as defined above at the ortho- or para- position. Examples include methoxy, such as 2,6-dimethoxyphenol.

[0050] The skilled person will appreciate that the aliphatic, alkoxy and aliphatic alkoxyphenols defined above may be combined. In some embodiments, the consumable may comprise an aliphatic phenol and an alkoxyphenol, or an aliphatic phenol and an aliphatic alkoxyphenol. For example, 4-propylphenol and 4-ethyl-2-methoxyphenol may be used in combination, although the present disclosure is not limited in this respect.

[0051] In some embodiments, the consumable may include less than about 1 wt% of an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof. In some embodiments, the consumable comprises less than about 1 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof, the aliphatic and/or alkoxy phenol being as defined above. In some embodiments, the consumable comprises less than about 0.75 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof. In some embodiments, the consumable comprises less than about 0.5 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof. In some embodiments, the consumable comprises less than about 0.25 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof. All of these wt% are based on the total weight of the consumable. In each of these embodiments, the aliphatic and/or alkoxy phenol may be as defined above. For example, the aliphatic and/or alkoxy phenol may be defined by the compound represented by formula (I) and the definitions associated therewith.

[0052] The lower limit of the aliphatic and/or alkoxyphenol is not limited in the present disclosure. If required, however, it may be 0.001 wt% based on the total weight of the consumable. In some embodiments, the consumable therefore comprises 0.001 wt% to about 1 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof, the aliphatic and/or alkoxy phenol being as defined above. In some embodiments, the consumable comprises 0.005 wt% to about 1 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof. In some embodiments, the consumable comprises about 0.01

wt% to about 1 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof. In some embodiments, the consumable comprises 0.01 wt% to about 0.75 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof. In some embodiments, the consumable comprises 0.01 wt% to about 0.5 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof. In some embodiments, the consumable comprises 0.01 wt% to about 0.25 wt% of the aliphatic and/or alkoxy phenol, or a combination thereof. All of these wt% are based on the total weight of the consumable. In each of these embodiments, the aliphatic and/or alkoxy phenol may be as defined above. For example, the aliphatic and/or alkoxy phenol may be defined by the compound represented by formula (I) and the definitions associated therewith.

[0053] In some embodiments, the consumable comprises 0.001 wt% to about 1 wt% of the aliphatic phenol and aliphatic alkoxy phenol. The aliphatic phenol may be an alkyl phenol, such as a C_1-C_6 alkyl phenol. The aliphatic alkoxy phenol may be an alkyl alkoxyphenol, such as a C_1-C_6 alkyl-substituted C_1-C_6 alkoxyphenol.

[0054] In some embodiments, the consumable comprises 0.005 wt% to about 1 wt% of the aliphatic phenol and aliphatic alkoxy phenol. The aliphatic phenol may be an alkyl phenol, such as a C_1-C_6 alkyl phenol. The aliphatic alkoxy phenol may be an alkyl alkoxyphenol, such as a C_1-C_6 alkyl-substituted C_1-C_6 alkoxyphenol.

[0055] In some embodiments the consumable comprises 0.01 wt% to about 0.5 wt% of the aliphatic phenol. The aliphatic phenol may be an alkyl phenol, such as a C_1-C_6 alkyl phenol.

[0056] In some embodiments the consumable comprises 0.01 wt% to about 0.25 wt% of the aliphatic phenol. The aliphatic phenol may be an alkyl phenol, such as a C_1-C_6 alkyl phenol.

[0057] In some embodiments the consumable comprises 0.01 wt% to about 0.5 wt% of the alkoxyphenol. The alkoxyphenol may be a C_1-C_6 alkoxy phenol.

[0058] In some embodiments the consumable comprises 0.001 wt% to about 0.25 wt% of the alkoxyphenol. The alkoxyphenol may be a C_1-C_6 alkoxy phenol.

Aliphatic Aldehyde

[0059] In addition, or as an alternative to the above-defined aliphatic and/or alkoxy phenol, the consumable of the present disclose may include an aliphatic aldehyde. The term "aliphatic" is defined above. The aliphatic aldehyde may be selected from acyclic aldehydes such as alkyl or alkenyl aldehydes. In some embodiments the alkyl group is a $C_{1\text{-}10}$ alkyl group. In some embodiments the alkyl group is a $C_{1\text{-}8}$ alkyl group. In some embodiments the alkyl group is a $C_{1\text{-}6}$ alkyl group. In some embodiments the alkyl groups include, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, pentyl and hexyl. In some embodiments the alkyl groups include methyl, ethyl, propyl or isopropyl. In some embodiments the alkenyl group is a $C_{2\text{-}10}$ alkenyl group. In some embodiments the alkenyl group is a $C_{2\text{-}8}$ alkenyl group. In some embodiments the alkenyl group is a $C_{2\text{-}6}$ alkenyl group.

[0060] In some embodiments, the aliphatic aldehyde may be an alkyl aldehyde, optionally wherein the alkyl group is C_1-C_{10} alkyl. In some embodiments, the aliphatic aldehyde may be selected from alkyl aldehyde, wherein the alkyl group is C_1-C_6 alkyl. In some embodiments the alkyl groups include methyl, ethyl, propyl and isopropyl. Examples include 3-methylbutanal. The chemical structure of this compound is shown in Annex 1.

[0061] The skilled person will appreciate that the aliphatic aldehyde may be combined with the aliphatic, alkoxy and aliphatic alkoxyphenols defined above. In some embodiments, the consumable may comprise an aliphatic phenol and an aliphatic aldehyde, or an alkoxyphenol and an aliphatic aldehyde, or an aliphatic aldehyde and an aliphatic alkoxyphenol. In other embodiments, the aliphatic aldehyde may be used instead of the phenolic compounds.

[0062] In some embodiments, the consumable may include less than about 1 wt% of an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof. In some embodiments, the consumable comprises less than about 1 wt% of the aliphatic aldehyde, the aliphatic aldehyde being as defined above. In some embodiments, the consumable comprises less than about 0.75 wt% of the aliphatic aldehyde. In some embodiments, the consumable comprises less than about 0.5 wt% of the aliphatic aldehyde. In some embodiments, the consumable comprises less than about 0.25 wt% of the aliphatic aldehyde. All of these wt% are based on the total weight of the consumable. In each of these embodiments, the aliphatic aldehyde may be as defined above. For example, the aliphatic aldehyde may be an alkyl aldehyde, optionally wherein the alkyl group is C_1-C_{10} alkyl.

[0063] The lower limit of the aliphatic aldehyde is not limited in the present disclosure. If required, however, it may be 0.001 wt% based on the total weight of the consumable. In some embodiments, the consumable therefore comprises 0.001 wt% to about 1 wt% of the aliphatic aldehyde, the aliphatic aldehyde being as defined above. In some embodiments, the consumable comprises 0.005 wt% to about 1 wt% of the aliphatic aldehyde. In some embodiments, the consumable comprises about 0.01 wt% to about 1 wt% of the aliphatic aldehyde. In some embodiments, the consumable comprises 0.01 wt% to about 0.75 wt% of the aliphatic aldehyde. In some embodiments the consumable comprises about 0.01 wt% to about 0.5 wt% of the aliphatic aldehyde. In some embodiments, the consumable comprises about 0.01 wt% to about 0.25 wt% of the aliphatic aldehyde. All of these wt% are based on the total weight of the consumable. In each of these embodiments, the aliphatic aldehyde may be as defined above. For example, the aliphatic aldehyde may be an alkyl aldehyde, optionally wherein the alkyl group is C_1-C_{10} alkyl.

Further Compounds

[0064] In addition to the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof, the consumable of the present disclosure includes at least two further compounds. In some embodiments the total amount of these at least two further compounds is less than about 5 wt%, based on the total weight of the consumable.

[0065] The at least two further compounds are selected from substituted pyrroles, substituted furans, substituted furanones, substituted pyridines, substituted pyrazines, rose ketones, acyclic monoterpenoids, and trisulfides. Each of these compound classes are discussed further below.

[0066] The substituents of these compounds are not limited in the present disclosure. In some embodiments, however, the substituents may be selected from aromatic (e.g. benzene), aliphatic (e.g. alkyl or alkenyl), sulphur-containing (e.g. thiol), oxygen-containing (e.g. hydroxyl or alkoxy), nitrogen-containing (e.g. amino), or a combination thereof. In some embodiments the substituents may be selected from benzene, alkyl, thiol, hydroxyl, or a combination thereof.

Substituted pyrroles

[0067] When the consumable of the present disclosure includes a substituted pyrrole, the substituents may be aliphatic, aromatic, or a combination thereof. In some embodiments the substituted pyrrole is an aromatic substituted pyrrole; this means that the pyrrole is substituted by at least one aromatic group, i.e. other aliphatic substituents (e.g. alkyl or alkenyl) are not excluded from either the pyrrole ring or aromatic group. In some embodiments the aromatic substituted pyrrole is a C_6-C_{18} aromatic substituted pyrrole. In some embodiments the aromatic substituted pyrrole is a C_6-C_{12} aromatic substituted pyrrole.

[0068] In some embodiments the pyrrole is only substituted by an aromatic group, such as a C_6-C_{12} aromatic group, e.g. benzene. An example compound is indole. The chemical structure of indole is shown in Annex 1.

[0069] The amount of the substituted pyrrole may be less than about 1 wt%, based on the total weight of the consumable. In some embodiments, the amount of the substituted pyrrole may be less than about 0.5 wt%. In some embodiments the amount of the substituted pyrrole may be less than about 0.1 wt%. In some embodiments the amount of the substituted pyrrole may be less than about 0.01 wt%. All of these wt% are based on the total weight of the consumable.

[0070] In some embodiments the amount of the substituted pyrrole may be 0.0001 wt% to about 1 wt%. In some embodiments, the amount of the substituted pyrrole may be 0.0001 wt% to about 0.5 wt%. In some embodiments the amount of the substituted pyrrole may be 0.0001 wt% to about 0.1 wt%. All of these wt% are based on the total weight of the consumable.

Substituted furans

[0071] When the consumable of the present disclosure includes a substituted furan, the substituents may be aliphatic (e.g. alkyl or alkenyl), oxygen-containing (e.g. hydroxyl or alkoxy), sulphur-containing (e.g. thiol), nitrogen-containing (e.g. amino), or a combination thereof. In some embodiments, the substituents include at least one oxygen-containing (e.g. hydroxyl or alkoxy) or sulphur-containing (e.g. thiol) group. In some embodiments, the substituents include at least one sulphur-containing, such as thiol, group.

[0072] In some embodiments the at least one sulphur-containing substituent is a thiol, i.e. R-SH, where R is aliphatic (e.g. alkyl or alkenyl). In some embodiments the substituted furans are therefore thiol substituted furans, such as aliphatic thiol substituted furans, the aliphatic group being as defined above. By the term "thiol substituted furan" is meant that the furan includes at least one thiol group. The thiol substituted furan may also be substituted by one or more aliphatic group (e.g. alkyl or alkenyl).

[0073] In some embodiments the substituted furans are alkyl thiol substituted furans. In some embodiments the alkyl group is a C_{1-10} alkyl group. In some embodiments the alkyl group is a C_{1-8} alkyl group. In some embodiments the alkyl group is a C_{1-6} alkyl group. In some embodiments the alkyl groups include, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, pentyl and hexyl. In some embodiments the alkyl groups include methyl, ethyl, propyl or isopropyl.

[0074] In some embodiments the furan may only be substituted by sulphur-containing groups, e.g. thiols. An example compound is furfurylthiol, such as 2-furfurylthiol. The chemical structure of 2-furfurylthiol is shown in Annex 1.

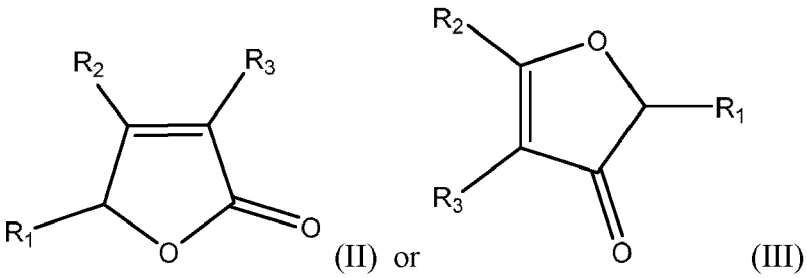
[0075] The amount of the substituted furan may be less than 0.0001 wt%, based on the total weight of the consumable. In some embodiments the amount of the substituted furan may be less than 0.00005 wt%. In some embodiments the amount of the substituted furan may be less than 0.00001 wt%. All of these wt% are based on the total weight of the consumable.

[0076] In some embodiments the substituted furan may be present in an amount of 1×10^{-7} to 1×10^{-4} wt%. In some embodiments the substituted furan may be present in an amount of 1×10^{-7} to 5×10^{-5} wt%. In some embodiments the substituted furan may be present in an amount of 1×10^{-7} to 1×10^{-5} wt%. All of these wt% are based on the total weight of the consumable.

Substituted furanones

[0077] When the consumable of the present disclosure includes substituted furanones, the substituents may be aliphatic (e.g. alkyl or alkenyl), oxygen-containing (e.g. hydroxyl or alkoxy), sulphur-containing (e.g. thiol), nitrogen-containing (e.g. amino), or a combination thereof. In some embodiments, the substituents are aliphatic (e.g. alkyl or alkenyl), oxygen-containing (e.g. hydroxyl or alkoxy) or sulphur-containing (e.g. thiol).

[0078] In some embodiments the substituted furanones may be represented by a compound of formula (II) or formula (III).



wherein R_1, R_2 and R_3 are each independently selected from hydrogen, aliphatic (e.g. alkyl or alkenyl) groups, oxygen-containing (e.g. hydroxyl or alkoxy) or sulphur-containing (e.g. thiol) groups, provided that at least one of R_1, R_2 and R_3 is not hydrogen.

[0079] In some embodiments R_1, R_2 and R_3 are each independently selected from hydrogen, alkyl groups, alkenyl groups, hydroxyl groups and alkoxy groups, provided that at least one of R_1, R_2 and R_3 is not hydrogen. The alkyl, alkenyl and alkoxy groups are as defined above. In some embodiments R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is not hydrogen. In some embodiments R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}6}$ alkyl groups, $C_{1\text{-}6}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}6}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is not hydrogen. In some embodiments R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}6}$ alkyl groups, and hydroxyl groups, provided that at least one of R_1, R_2 and R_3 is not hydrogen.

[0080] In some embodiments, at least one of R_1, R_2 and R_3 is a hydroxyl group. For example, R_3 may be a hydroxyl group. In some embodiments, at least one of R_1, R_2 and R_3 is a hydroxyl group and the other groups are $C_{1\text{-}10}$ alkyl groups. In some embodiments, at least one of R_1, R_2 and R_3 is a hydroxyl group and the other groups are $C_{1\text{-}6}$ alkyl groups. Example compounds include sotolone and furaneol. The chemical structures of these compounds are shown in Annex 1.

[0081] The amount of the substituted furanones may be less than about 1 wt%, based on the total weight of the consumable. In some embodiments, the amount of the substituted furanones may be less than about 0.5 wt%. In some embodiments the amount of the substituted furanones may be less than about 0.1 wt%. All of these wt% are based on the total weight of the consumable.

[0082] In some embodiments the amount of the substituted furanones may be 0.0001 wt% to about 1 wt%. In some embodiments, the amount of the substituted furanones may be 0.0001 wt% to about 0.5 wt%. In some embodiments the amount of the substituted furanones may be 0.0001 wt% to about 0.1 wt%. All of these wt% are based on the total weight of the consumable.

[0083] The above concentrations apply to the compound of formula (II) (e.g. sotolone), the compound of formula (III) (e.g. furaneol), and to combinations thereof. In some embodiments, the consumable may comprise a compound of formula (II) and a compound of formula (III) and the total amount of these compounds may be 0.0001 wt% to 0.1 wt% based on the total weight of the consumable.

Substituted pyridines

[0084] When the consumable of the present disclosure includes a substituted pyridine, the substituents may be aliphatic (e.g. alkyl or alkenyl), oxygen-containing (e.g. hydroxyl or alkoxy), sulphur-containing (e.g. thiol), nitrogen-containing (e.g. amino), or a combination thereof. In some embodiments, the substituents are aliphatic, where aliphatic is defined herein above.

[0085] In some embodiments the substituted pyridines are therefore aliphatic substituted pyridines, such as alkyl substituted pyridines. In some embodiments the alkyl group is a $C_{1\text{-}10}$ alkyl group. In some embodiments the alkyl group is a $C_{1\text{-}8}$ alkyl group. In some embodiments the alkyl group is a $C_{1\text{-}6}$ alkyl group. In some embodiments the alkyl groups include, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, pentyl and hexyl. In some embodiments the alkyl groups include methyl, ethyl, propyl or isopropyl.

[0086] In some embodiments the pyridines are substituted in the ortho- or para- positions.

[0087] In some embodiments the pyridine may only be substituted by alkyl groups, e.g. C_{1-10} alkyl groups, such as C_{1-6} alkyl groups. In some embodiments the pyridine may include at least two alkyl group substituents. An example compound is dimethylpyridine, such as 2,4-dimethylpyridine. The chemical structure of 2,4-dimethylpyridine is shown in Annex 1.

[0088] The amount of the substituted pyridine (e.g. aliphatic substituted pyridine as defined above) may be less than 0.1 wt%, based on the total weight of the consumable. In some embodiments the amount of the substituted pyridine may be less than 0.05 wt%. In some embodiments the amount of the substituted pyridine may be less than 0.025 wt%. All of these wt% are based on the total weight of the consumable.

[0089] In some embodiments the substituted pyridine (e.g. aliphatic substituted pyridine as defined above) may be present in an amount of 0.0001 wt% to about 0.1 wt%, based on the total weight of the consumable. In some embodiments the amount of the substituted pyridine may be 0.0001 wt% to about 0.05 wt%. In some embodiments the amount of the substituted pyridine may be 0.001 wt% to about 0.025 wt%. All of these wt% are based on the total weight of the consumable.

Substituted pyrazines

[0090] When the consumable of the present disclosure includes a substituted pyrazine, the substituents may be aliphatic (e.g. alkyl or alkenyl), oxygen-containing (e.g. hydroxyl or alkoxy), sulphur-containing (e.g. thiol), nitrogen-containing (e.g. amino), or a combination thereof. In some embodiments, the substituents are aliphatic, where aliphatic is defined herein above.

[0091] In some embodiments the substituted pyrazines are therefore aliphatic substituted pyrazines, such as alkyl substituted pyrazines. In some embodiments the alkyl group is a C_{1-10} alkyl group. In some embodiments the alkyl group is a C_{1-8} alkyl group. In some embodiments the alkyl group is a C_{1-6} alkyl group. In some embodiments the alkyl groups include, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, pentyl and hexyl. In some embodiments the alkyl groups include methyl, ethyl, propyl or isopropyl.

[0092] In some embodiments the pyrazine may only be substituted by alkyl groups, e.g. C_{1-10} alkyl groups, such as C_{1-6} alkyl groups. In some embodiments the pyrazine may include at least two alkyl group substituents. An example compound is ethyldimethylpyrazine, such as 2-ethyl-3,5-dimethylpyrazine. The chemical structure of 2-ethyl-3,5-dimethylpyrazine is shown in Annex 1.

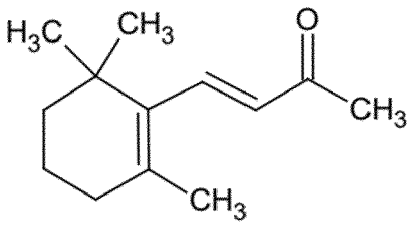
[0093] The amount of the substituted pyrazine (e.g. aliphatic substituted pyrazine as defined above) may be less than 0.01 wt%, based on the total weight of the consumable. In some embodiments the amount of the substituted pyrazine may be less than 0.005 wt%. All of these wt% are based on the total weight of the consumable.

[0094] In some embodiments the substituted pyrazine (e.g. aliphatic substituted pyrazine as defined above) may be present in an amount of 0.0001 wt% to about 0.01 wt%, based on the total weight of the consumable. In some embodiments the amount of the substituted pyrazine may be 0.0001 wt% to about 0.005 wt%. All of these wt% are based on the total weight of the consumable.

Rose ketones

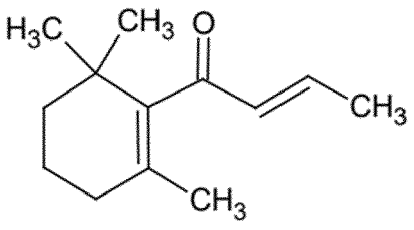
[0095] When the consumable of the present disclosure includes a rose ketone, the rose ketone may be damascone- and damascenone-type or ionone-type. The molecular backbones of these rose ketone types are known in the art and shown as formula (IV) and (V) below.

Ionone-type



(IV)

Damascone- and damascenone-type



(V)

[0096] The rose ketones are α, β-ketones with a trimethylcyclohexene substituent at the α- or γ- position from the ketone

group. The position and level of unsaturation in the cyclohexene group may vary, and likewise the length of the alkyl chain around the ketone group.

[0097] In some embodiments the rose ketones are damascone- and damascenone-type rose ketones, i.e. are α, β-ketones with a trimethylcyclohexene substituent at the α- position from the ketone group. In some embodiments, the rose ketone is a damascone, such as beta-damascone. The chemical structure of beta-damascone is shown in Annex 1.

[0098] The amount of the rose ketone may be less than 0.1 wt%, based on the total weight of the consumable. In some embodiments the amount of the rose ketone may be less than 0.05 wt%. In some embodiments the amount of the rose ketone may be less than 0.01 wt%. All of these wt% are based on the total weight of the consumable.

[0099] In some embodiments the rose ketone may be present in an amount of 0.0001 wt% to about 0.1 wt%, based on the total weight of the consumable. In some embodiments the amount of the rose ketone may be 0.0001 wt% to about 0.05 wt%. In some embodiments the amount of the rose ketone may be 0.0001 wt% to about 0.01 wt%. All of these wt% are based on the total weight of the consumable.

Acyclic monoterpenoids

[0100] When the consumable of the present disclosure includes an acyclic monoterpenoid, the monoterpenoid may include an oxygen functionality, such as a hydroxyl or alkoxy group. In some embodiments the acyclic monoterpenoid is a hydroxyl-containing acyclic monoterpenoid. An example compound is geraniol. The chemical structure of geraniol is shown in Annex 1.

[0101] The amount of the acyclic monoterpenoid (e.g. hydroxyl-containing acyclic monoterpenoid) may be less than 0.1 wt%, based on the total weight of the consumable. In some embodiments the amount of the acyclic monoterpenoid may be less than 0.05 wt%. In some embodiments the amount of the acyclic monoterpenoid may be less than 0.01 wt%. All of these wt% are based on the total weight of the consumable.

[0102] In some embodiments the acyclic monoterpenoid may be present in an amount of 0.0001 wt% to about 0.1 wt%, based on the total weight of the consumable. In some embodiments the amount of the acyclic monoterpenoid may be 0.0001 wt% to about 0.05 wt%. In some embodiments the amount of the acyclic monoterpenoid may be 0.0001 wt% to about 0.01 wt%. All of these wt% are based on the total weight of the consumable.

Trisulfides

[0103] When the consumable of the present disclosure includes a trisulfide, the substituents may be aliphatic (e.g. alkyl or alkenyl). In some embodiments, the substituents are alkyl, where alkyl is defined herein above. In some embodiments the trisulfides are therefore aliphatic trisulfides, such as alkyl trisulfides. In some embodiments the alkyl group is a C_{1-10} alkyl group. In some embodiments the alkyl group is a C_{1-8} alkyl group. In some embodiments the alkyl group is a C_{1-6} alkyl group. In some embodiments the alkyl groups include, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, pentyl and hexyl. In some embodiments the alkyl groups include methyl, ethyl, propyl or isopropyl. An example compound is dimethyl trisulphide. The chemical structure of dimethyl trisulfide is shown in Annex 1.

[0104] The amount of the trisulfide (e.g. aliphatic trisulfide as defined above) may be less than 1×10^{-4} wt%, based on the total weight of the consumable. In some embodiments the amount of the trisulfide may be less than 1×10^{-5} wt%. All of these wt% are based on the total weight of the consumable.

[0105] In some embodiments the trisulfide (e.g. aliphatic trisulfide as defined above) may be present in an amount of 1×10^{-7} wt% to about 1×10^{-4} wt%, based on the total weight of the consumable. In some embodiments the amount of the trisulfide may be 1x10-' wt% to about 1×10^{-5} wt%. All of these wt% are based on the total weight of the consumable.

[0106] All embodiments include, where appropriate, all enantiomers and tautomers of the compounds defined herein. The person skilled in the art will recognise compounds that possess optical properties (one or more chiral carbon atoms) or tautomeric characteristics. The corresponding enantiomers and/or tautomers may be isolated/prepared by methods known in the art.

[0107] Some of the compounds may also exist as stereoisomers and/or geometric isomers - e.g. they may possess one or more asymmetric and/or geometric centres and so may exist in two or more stereoisomeric and/or geometric forms. All embodiments include, where appropriate, the use of all the individual stereoisomers and geometric isomers of those compounds, and mixtures thereof. The terms used in the claims encompass these forms.As the skilled person will appreciate, the above compound definitions may be combined along with the recited concentrations. Some exemplary combinations are presented below and in the appended set of embodiments.

Total Amount of the Further Compounds

[0108] In some embodiments, the total amount of the at least two further compounds may be about 0.000001 wt% to about 5 wt%, based on the total weight of the consumable. In some embodiments, the total amount of the at least two

further compounds may be about 0.00001 wt% to about 5 wt%, based on the total weight of the consumable. In some embodiments, the total amount of the at least two further compounds may be about 0.0001 to 5 or 4 or 3 or 2 or 1 wt%, based on the total weight of the consumable. In some embodiments, the total amount of the at least two further compounds may be about 0.001 wt% to about 1 wt%, based on the total weight of the consumable. As the skilled person will appreciate, these concentration ranges apply to the above-defined compounds and further in combination with the aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof as defined herein.

[0109] In some embodiments, the at least two further compounds are present in an amount of from about 0.0001 wt% to about 5 wt%, based on the total weight of the consumable, and selected from aromatic substituted pyrroles (e.g. C_6-C_{12} aromatic substituted pyrroles), furans substituted with at least one sulphur-containing group (e.g. an aliphatic thiol), substituted furanones represented by a compound of formula (II) or formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, aliphatic (e.g. alkyl or alkenyl) groups, oxygen-containing (e.g. hydroxyl or alkoxy) or sulphur-containing (e.g. thiol) groups, provided that at least one of R_1, R_2 and R_3 is not hydrogen, aliphatic (e.g. alkyl) substituted pyridines, aliphatic (e.g. alkyl) substituted pyrazines, damascone or damascenone-type rose ketones, oxygen-containing (e.g. hydroxyl) acyclic monoterpenoids, and aliphatic (e.g. alkyl) trisulfides.

[0110] In some embodiments, the at least two further compounds are present in an amount of from about 0.0001 wt% to about 1 wt%, based on the total weight of the consumable, and selected from aromatic substituted pyrroles (e.g. C_6-C_{12} aromatic substituted pyrroles), furans substituted with at least one sulphur-containing group (e.g. an aliphatic thiol), substituted furanones represented by a compound of formula (II) or formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, aliphatic (e.g. alkyl or alkenyl) groups, oxygen-containing (e.g. hydroxyl or alkoxy) or sulphur-containing (e.g. thiol) groups, provided that at least one of R_1, R_2 and R_3 is not hydrogen, aliphatic (e.g. alkyl) substituted pyridines, aliphatic (e.g. alkyl) substituted pyrazines, damascone or damascenone-type rose ketones, oxygen-containing (e.g. hydroxyl) acyclic monoterpenoids, and aliphatic (e.g. alkyl) trisulfides.

[0111] In some embodiments, the at least two further compounds are present in an amount of from about 0.001 wt% to about 1 wt%, based on the total weight of the consumable, and selected from aromatic substituted pyrroles (e.g. C_6-C_{12} aromatic substituted pyrroles), furans substituted with at least one sulphur-containing group (e.g. an aliphatic thiol), substituted furanones represented by a compound of formula (II) or formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, aliphatic (e.g. alkyl or alkenyl) groups, oxygen-containing (e.g. hydroxyl or alkoxy) or sulphur-containing (e.g. thiol) groups, provided that at least one of R_1, R_2 and R_3 is not hydrogen, aliphatic (e.g. alkyl) substituted pyridines, aliphatic (e.g. alkyl) substituted pyrazines, damascone or damascenone-type rose ketones, oxygen-containing (e.g. hydroxyl) acyclic monoterpenoids, and aliphatic (e.g. alkyl) trisulfides.

Combinations

[0112] In some embodiments, the above-defined compounds and concentrations thereof may be combined with one another. Various combinations are defined in the appended claims and numbered embodiments. The consumable may, for example, include 10 or less of the defined compounds, such as 9 or less, or even 8 or less.

[0113] In some embodiments, the one or more compounds include at least one compound selected from acyclic and alkoxyphenols, such as alkyl, alkenyl and/or alkoxyphenols, optionally wherein the phenols are represented by a compound of formula (I) as defined above, a substituted furanone represented by a compound of formula (II) as defined above, optionally wherein at least one of R_1, R_2 and R_3 is a hydroxyl group, and/or an aliphatic substituted pyridine, such as an alkyl substituted pyridine. In some embodiments the one or more compounds include at least one compound selected from 4-propylphenol, 4-ethyl-2-methoxyphenol, 3-ethylphenol, 2,6-dimethoxyphenol, sotolone and/or 2,4-dimethylpyridine.

[0114] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para- position;

(iii) an aromatic substituted pyrrole, optionally wherein the aromatic group is a C_6-C12 aromatic group;

(iv) a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic

thiol; and

(v) a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, C_{1-10} alkyl groups, C_{1-10} alkenyl groups, hydroxyl groups and C_{1-10} alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0115] In some embodiments the consumable comprises an aerosol former material, and:

(i) 0.001 wt% to about 0.5 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.001 wt% to about 0.5 wt% of an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para-position;

(iii) 0.0001 wt% to about 0.01 wt% of an aromatic substituted pyrrole, optionally wherein the aromatic group is a C_6-C_{12} aromatic group; and

(iv) 1×10^{-7} wt% to 5×10^{-5} wt% of a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; or

(v) 0.0001 wt% to about 0.1 wt% of a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, C_{1-10} alkyl groups, C_{1-10} alkenyl groups, hydroxyl groups and C_{1-10} alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0116] In some embodiments the consumable comprises 4-propylphenol, 4-ethyl-2-methoxyphenol, and indole, and 2-furfurylthiol or sotolone. In some embodiments the consumable comprises 0.001 wt% to about 0.5 wt% 4-propylphenol, 0.001 wt% to about 0.5 wt% 4-ethyl-2-methoxyphenol, and 0.001 wt% to about 0.01 wt% indole, and 1×10^{-7} wt% to 5×10^{-5} wt% 2-furfurylthiol or 0.0001 wt% to about 0.1 wt% sotolone.

[0117] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para- position;

(iii) an aromatic substituted pyrrole, optionally wherein the aromatic group is a C_6-C_{12} aromatic group; and

(iv) an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups; and

(v) an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups.

[0118] In some embodiments the consumable comprises an aerosol former material, and:

(i) 0.001 wt% to about 0.5 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.001 wt% to about 0.5 wt% of an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para-position;

(iii) 0.0001 wt% to about 0.01 wt% of an aromatic substituted pyrrole, optionally wherein the aromatic group is a C_6-C_{12} aromatic group; and

(iv) 0.0001 wt% to about 0.05 wt% of an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups; and

(v) 0.0001 wt% to about 0.01 wt% of an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups.

[0119] In some embodiments the consumable comprises 4-propylphenol, 4-ethyl-2-methoxyphenol, indole, 2,4-dimethylpyridine, and 2-ethyl-3,5-dimethylpyrazine. In some embodiments the consumable comprises 0.001 wt% to about 0.5 wt% 4-propylphenol, 0.001 wt% to about 0.5 wt% 4-ethyl-2-methoxyphenol, 0.001 wt% to about 0.01 wt% indole, 0.0001 wt% to about 0.05 wt% 2,4-dimethylpyridine, and 0.0001 wt% to about 0.01 wt% 2-ethyl-3,5-dimethylpyrazine.

[0120] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta-or para-position;

(ii) an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) a substituted furanone represented by a compound of formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group; and

(iv) a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0121] In some embodiments the consumable comprises an aerosol former material, and:

(i) 0.001 wt% to about 0.5 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.0001 wt% to about 0.01 wt% of an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 0.0001 wt% to about 0.1 wt% of a substituted furanone represented by a compound of formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group; and

(iv) 0.0001 wt% to about 0.1 wt% of a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0122] In some embodiments the consumable comprises 3-ethylphenol, 2-ethyl-3,5-dimethylpyrazine, sotolone and furaneol. In some embodiments the consumable comprises 0.001 wt% to about 0.5 wt% 3-ethylphenol, 0.0001 wt% to about 0.01 wt% 2-ethyl-3,5-dimethylpyrazine, 0.0001 wt% to about 0.1 wt% sotolone and 0.0001 wt% to about 0.1 wt% furaneol.

[0123] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; and

(iv) a rose ketone which is an α,β-ketone with a trimethylcyclohexene substituent at the α- position from the ketone group.

[0124] In some embodiments the consumable comprises an aerosol former material, and:

(i) 0.001 wt% to about 0.5 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.0001 wt% to about 0.01 wt% of an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 1×10^{-7} wt% to 5×10^{-5} wt% of a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; and

(iv) 0.0001 to about 0.05 wt% of a rose ketone which is an α,β-ketone with a trimethylcyclohexene substituent at the α-position from the ketone group

[0125] In some embodiments the consumable comprises 2-furfurylthiol, 2,4-dimethylpyridine, 3-ethylphenol, and β-damascone. In some embodiments the consumable comprises 1×10^{-7} wt% to 5×10^{-5} wt% 2-furfurylthiol, 0.0001 wt% to about 0.01 wt% 2,4-dimethylpyridine, 0.001 wt% to about 0.5 wt% 3-ethylphenol, and 0.0001 to about 0.05 wt% β-damascone.

[0126] In some embodiments the consumable comprises:

(i) an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para- position;

(ii) an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) an oxygen-containing acyclic monoterpenoid, optionally wherein the oxygen-containing group is a hydroxyl- or alkoxy- group; and

(iv) an aliphatic trisulfide, such as an alkyl trisulfide.

[0127] In some embodiments the consumable comprises an aerosol former material, and:

(i) 0.01 wt% to about 1 wt% an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para-position;

(ii) 0.0001 wt% to about 0.01 wt% an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10}

alkyl groups;

(iii) 0.0001 wt% to about 0.01 wt% of an oxygen-containing acyclic monoterpenoid, optionally wherein the oxygen-containing group is a hydroxyl- or alkoxy- group; and

(iv) 1x10-' wt% to about 1×10^{-5} wt% of an aliphatic trisulfide, such as an alkyl trisulfide.

[0128] In some embodiments the consumable comprises 2-ethyl-3,5-dimethylpyrazine, 2,6-dimethoxyphenol, geraniol, and dimethyl trisulphide. In some embodiments the consumable comprises 0.0001 wt% to about 0.01 wt% 2-ethyl-3,5-dimethylpyrazine, 0.01 wt% to about 1 wt% 2,6-dimethoxyphenol, 0.0001 wt% to about 0.01 wt% geraniol, and 1×10^{-7} wt% to about 1×10^{-5} wt% dimethyl trisulphide.

[0129] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol;

(iv) a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group; and

(v) an aliphatic trisulfide, such as an alkyl trisulfide.

[0130] In some embodiments the consumable comprises an aerosol former material, and:

(i) 0.01 wt% to about 1 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.0001 wt% to about 0.01 wt% of an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 1×10^{-7} wt% to 5×10^{-5} wt% of a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol;

(iv) 0.0001 wt% to about 0.1 wt% of a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group; and

(v) 1×10^{-7} wt% to about 1×10^{-5} wt% of an aliphatic trisulfide, such as an alkyl trisulfide.

[0131] In some embodiments the consumable comprises 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 3-ethylphenol, and dimethyl trisulphide. In some embodiments the consumable comprises 1×10^{-7} wt% to 5×10^{-5} wt% 2-furfurylthiol, 0.0001 wt% to about 0.1 wt% sotolone, 0.0001 wt% to about 0.01 wt% 2,4-dimethylpyridine, 0.01 wt% to about 1 wt% 3-ethylphenol, and 1x10-' wt% to about 1×10^{-5} wt% dimethyl trisulphide.

[0132] In some embodiments the consumable comprises:

(i) an aliphatic aldehyde, optionally wherein the aliphatic group is a $C_{1\text{-}10}$ alkyl group;

(ii) an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iv) a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; and

(v) a substituted furanone represented by a compound of formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, C_{1-10} alkyl groups, C_{1-10} alkenyl groups, hydroxyl groups and C_{1-10} alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0133] In some embodiments the consumable comprises an aerosol former material, and:

(i) 0.001 wt% to less than about 1 wt% of an aliphatic aldehyde, optionally wherein the aliphatic group is a C_{1-10} alkyl group;

(ii) 0.0001 wt% to about 0.01 wt% of an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 0.0001 wt% to about 0.01 wt% of an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iv) 1x10-' wt% to 5×10^{-5} wt% of a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; and

(v) 0.0001 wt% to about 0.1 wt% of a substituted furanone represented by a compound of formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, C_{1-10} alkyl groups, C_{1-10} alkenyl groups, hydroxyl groups and C_{1-10} alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0134] In some embodiments the consumable comprises 2-furfurylthiol, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, and 3-methylbutanal. In some embodiments the consumable comprises 1×10^{-7} wt% to 5×10^{-5} wt% 2-furfurylthiol, 0.0001 wt% to about 0.01 wt% 2,4-dimethylpyridine, 0.0001 wt% to about 0.01 wt% 2-ethyl-3,5-dimethylpyrazine, .0001 wt% to about 0.1 wt% furaneol, and 0.001 wt% to less than about 1 wt% 3-methylbutanal.

Aerosol-former material

[0135] In some embodiments the consumable comprises an aerosol former material. The aerosol-former material may comprise one or more constituents capable of forming an aerosol. The consumable may comprise aerosol former material in an amount of at least 70 wt% on the basis of the total mass of the consumable. In some embodiments the consumable comprises aerosol former material in an amount of at least 80 wt% on the basis of the total mass of the consumable. In some embodiments the consumable comprises aerosol former material in an amount of at least 90 wt% on the basis of the total mass of the consumable. In some embodiments the consumable comprises aerosol former material in an amount of at least 95 wt% on the basis of the total mass of the consumable.

[0136] In some embodiments, the aerosol-former material may comprise one or more of glycerol, propylene glycol, diethylene glycol, triethylene glycol, tetraethylene glycol, 1,3-butylene glycol, ethyl vanillate, ethyl laurate, a diethyl suberate, benzyl benzoate, benzyl phenyl acetate, tributyrin, lauryl acetate, lauric acid, myristic acid, and propylene carbonate. In some embodiments, the aerosol-former material may comprise one or more of propylene glycol, or glycerol. In some cases, the aerosol-former material comprises, consists essentially of or consists of glycerol, or a mixture of glycerol and propylene glycol.

[0137] In some embodiments, the aerosol-former material comprises a mixture of glycerol and propylene glycol in a weight ratio of glycerol to propylene glycol of about 3:1 to 1:3, about 2:1 to 1:2, about 1.5:1 to 1:1.5, about 55:45 to 45:55, or about 45:55.

Additional Constituents

[0138] In addition to the compounds defined above, the consumable may comprise one or more further constituents. The concentration of the one or more further constituents is not limited and in some embodiments may be about 0.001 wt% to about 10 wt% of the consumable.

[0139] The consumable of the present disclosure may comprise one or more sensates. By the term "sensate" or "sensate compound" - used interchangeably herein - is meant a compound that triggers a sensation mediated by the

trigeminal nerve of a user. The use of sensate compounds is well-documented in food and pharmaceutical industries, and the triggered sensations include cooling, warming, and tingling sensations. When used in an aerosolisable formulation, such sensations should be experienced in the oral cavity, the nasal cavity and/or the skin of the user. The present disclosure is not limited in this respect although preference is given for sensations experienced in the oral and/or nasal cavities. The terms "cooling", "warming" and "tingling" are well-understood in the art.

[0140] Cooling agents, warming agents and tingling agents are each typically small organic molecules which deliver a cooling, warming or tingling sensation to a user upon contact with the oral cavity, nasal cavity and/or skin. This sensation falls under the category of chemesthetic sensations and arises because the small organic molecule activates certain receptors in the skin and/or mucous membranes. The experience of a cooling, warming and/or tingling sensation thus relies on chemesthesis of the user. Chemesthesis is also referred to in the art as the "common chemical sense" or trigeminal chemosensation because it typically refers to sensations that are mediated by the trigeminal nerve and which are elements of the somatosensory system, distinguishing them from olfaction (sense of smell) and taste.

[0141] The consumable of the present disclosure may comprise a warming or tingling agent. The warming agent or tingling agent may be selected from the group consisting of vanilloids, sanshools, piperine, allyl isothiocyanate, cinnamyl phenyl propyl compounds, ethyl esters, and combinations thereof, or the warming agent or tingling agent may be an extract from at least one of horseradish oil, ginger oil, black pepper, long pepper, Szechuan pepper, cayenne pepper, Uzazi or mustard oil.

[0142] Vanilloids are compounds which possess a vanillyl group, and a number of vanilloids bind to the transient receptor potential vanilloid type 1 or TRPV1 receptor, an ion channel which naturally responds to stimuli. TRPV1 is therefore an element of the mammalian somatosensory system. Vanilloids include capsaicin (8-methyl-*N*-vanillyl-6-nonenamide) and nonivamide as well as 3-phenylpropyl homovanillate, the major component of SymHeat PV used in the Examples herein. Other vanilloids include gingerols, zingerone, and shogaols as well as vanillyl ethyl ether, vanillyl propyl ether, vanillyl butyl ether and vanillyl butyl ether acetate.

[0143] Sanshools are exemplified by hydroxy-alpha-sanshool, a compound responsible for the numbing and tingling sensation caused by eating food cooked with Szechuan peppercorns and Uzazi. The term "sanshool" is derived from the Japanese term for the Japanese pepper and the suffix "ol" meaning "alcohol". It is an agonist of TRPV1 and TRPA1 (an ion channel best known as a sensor for pain, cold, and itch in humans and other mammals).

[0144] Cinnamyl phenylpropyl compounds have a common structural characteristic of an aryl substituted primary alcohol/aldehyde/ester. They include 3-phenylpropyl cinnamate and 3-phenyl-1-propanol, which each have a spicy taste and balsamic odour, as well as 3-phenylpropyl isobutyrate which has a fruity taste and odour. In some embodiments, the cinnamyl phenylpropyl compounds are selected from 3-phenylpropyl cinnamate, 3-phenyl-1-propanol and combinations thereof.

[0145] In some embodiments, the warming agent or tingling agent is selected from the group consisting of vanilloids, sanshools, piperine, cinnamyl phenylpropyl compounds, ethyl esters, and combinations thereof, or the warming agent or tingling agent is an extract from at least one of horseradish oil, mustard oil, ginger oil, black pepper, long pepper, Szechuan pepper, cayenne pepper, or Uzazi. In some embodiments, the warming agent or tingling agent is selected from the group consisting of vanillyl ethyl ether, vanillyl propyl ether, 3-phenylpropyl homovanillate, capsaicinoids, gingerols (e.g. [6], [8], [10] and/or [12]-gingerol), vanillyl butyl ether, vanillyl butyl ether acetate, sanshools, piperine, zingerone, shogaols (e.g. (6)-shogaol), allyl isothiocyanate, and combinations thereof, or the warming agent or tingling agent is an extract from at least one of horseradish oil, ginger oil, black pepper, long pepper, Szechuan pepper, cayenne pepper, Uzazi or mustard oil.

[0146] All embodiments include, where appropriate, all enantiomers and tautomers of the compounds defined herein. The person skilled in the art will recognise compounds that possess optical properties (one or more chiral carbon atoms) or tautomeric characteristics. The corresponding enantiomers and/or tautomers may be isolated/prepared by methods known in the art. Some of the compounds may also exist as stereoisomers and/or geometric isomers - e.g. they may possess one or more asymmetric and/or geometric centres and so may exist in two or more stereoisomeric and/or geometric forms. All embodiments include, where appropriate, the use of all the individual stereoisomers and geometric isomers of those compounds, and mixtures thereof. The terms used in the claims encompass these forms. Piperine has, for example, four geometric isomers including chavicine, isochavicine and isopiperine. The term "piperine" is used herein to refer to all the individual geometric isomers, and mixtures thereof.

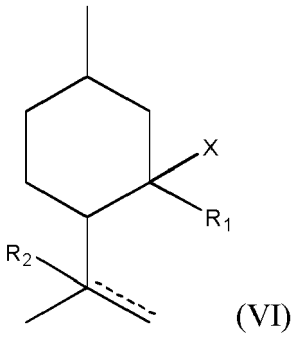
[0147] The one or more sensates as defined may be present in the consumable in an amount of about 0.001 wt% to about 10 wt%, based on the total weight of the consumable. As will be understood by the person skilled in the art, this concentration range applies to the total amount of sensates, e.g. warming agent or tingling agent and optionally cooling agent. The inclusion of a cooling agent is discussed further below.

[0148] The concentration range of about 0.001 wt% to about 10 wt% also applies to the above definition of the one or more sensates. For example, the consumable may comprise about 0.001 wt% to about 10 wt% of one or more sensates wherein at least one sensate is a warming agent or a tingling agent and the warming agent or tingling agent is selected from the group consisting of vanilloids, sanshools, piperine, cinnamyl phenylpropyl compounds, ethyl esters, and combinations thereof, or is an extract from at least one of ginger oil, black pepper, long pepper, Szechuan pepper, cayenne pepper, or

Uzazi. In some embodiments the warming agent or tingling agent comprises a vanilloid, such as 3-phenylpropyl homovanillate.

[0149] In some embodiments the one or more sensate as defined herein is present in the consumable in an amount of about 0.001 wt% to about 5 wt%, based on the total weight of the consumable, such as about 0.001 wt% to about 2.5 wt%. In some embodiments the warming agent or tinging agent may be present at a concentration of about 0.0001 wt% to about 5 wt%, based on the total weight of the aerosolisable formulation, and is selected from the group consisting of vanilloids, sanshools, piperine, cinnamyl phenylpropyl compounds, ethyl esters, and combinations thereof, or the warming agent or tingling agent is an extract from at least one of ginger oil, black pepper, long pepper, Szechuan pepper, cayenne pepper, or Uzazi, e.g. vanilloids.

[0150] In some embodiments, the one or more sensates comprises a cooling agent. The term "cooling agent" is defined above. It may be menthol or a cooling agent which is a compound of formula (VI) or a salt and/or solvate thereof.



(VI)

wherein X is hydrogen or OR', wherein R' is an alkyl group or an alkenyl group which may be taken together with R_1 to form a three to five-membered heterocyclyl group, wherein the heterocyclyl group is optionally substituted by one or more substituents selected from OH, O-alkyl, alkyl-OH, alkyl-O-alkyl, NH_2, NH-alkyl, N-$(alkyl)_2$, NO_2 and CN; and wherein R_1 and R_2 are each independently selected from hydrogen, OH, OR_a, $C(O)NR_bR_c$ and $C(O)OR_bR_c$; and when the double bond is present, R_2 is absent;

[0151] wherein R_a is an alkyl group, an alkenyl group, a $C(O)R_f$ group, or a C(O)-alkyl-$C(O)R_f$ group wherein the alkyl groups and alkenyl groups are optionally substituted by one or more substituents selected from OH, O-alkyl, NH_2, NH-alkyl, N-$(alkyl)_2$, NO_2 and CN; and wherein R_f is an alkyl group, an alkenyl group, OH, O-alkyl, NH_2, NH-alkyl or N-$(alkyl)_2$, wherein the alkyl groups and alkenyl groups are optionally substituted by one or more substituents selected from OH, O-alkyl, NH_2, NH-alkyl, N-$(alkyl)_2$, NO_2 and CN;

[0152] wherein R_b and R_c are each independently hydrogen, an alkyl group, an alkenyl group, an aryl group, an aralkyl group, a heteroaryl group, or a heteroaralkyl group, wherein the alkyl groups, alkenyl groups, aryl groups and heteroaryl groups are optionally substituted by one or more substituents selected from OH, O-alkyl, NH_2, NH-alkyl, N-$(alkyl)_2$, NO_2, CN and $C(O)R_f$.

[0153] In some embodiments X is hydrogen.

[0154] In some embodiments X is OR', wherein R' is an alkyl group or an alkenyl group which is taken together with R_1 to form a three to five-membered heterocyclyl group, wherein the heterocyclyl group is optionally substituted by OH, O-alkyl or alkyl-OH. In some embodiments X is OR', wherein R' is an alkyl group which is taken together with R_1 to form a four or five-membered heterocyclyl group, wherein the heterocyclyl group is optionally substituted by alkyl-OH. In some embodiments X is OR', wherein R' is an alkyl group which is taken together with R_1 to form a four or five-membered heterocyclyl group, wherein the heterocyclyl group is optionally substituted by alkyl-OH, and wherein R_1 is OR_a wherein R_a is an alkyl group and wherein R_2 is absent or hydrogen.

[0155] In some embodiments R_1 is selected from OH, OR_a and $C(O)NR_bR_c$ and R_2 is either absent or selected from OH and OR_a. In some embodiments R_1 is OH. In some embodiments R_1 is OH and R_2 is selected from OH and OR_a.

[0156] In some embodiments X is hydrogen and R_1 is selected from OH, OR_a and $C(O)NR_bR_c$. R_2 is either absent or selected from OH and OR_a. In some embodiments X is hydrogen, R_1 is selected from OR_a and $C(O)NR_bR_c$ and R_2 is either absent or selected from OH and OR_a.

[0157] In some embodiments R_1 is OR_a and R_a is an alkyl group substituted by one or more OH substituents. R_2 may be hydrogen.

[0158] In some embodiments R_1 is OR_a and R_a is a $C(O)R_f$ group, or a C(O)-alkyl-$C(O)R_f$ group, wherein R_f is an alkyl group optionally substituted by one or more OH substituents or R_f is OH. R_2 may be hydrogen.

[0159] In some embodiments R_1 is $C(O)NR_bR_c$, wherein R_b and R_c are each independently hydrogen, an alkyl group, an aryl group, an aralkyl group, a heteroaryl group, or a heteroaralkyl group. In some embodiments R_1 is $C(O)NR_bR_c$ and at least one of R_b and R_c is hydrogen. R_2 may be hydrogen.

[0160] In some embodiments R_1 is $C(O)NR_bR_c$, wherein R_b is hydrogen and R_c is selected from the group consisting of an alkyl group, an aryl group, an aralkyl group and a heteroaralkyl group. R_2 may be hydrogen.

[0161] As used herein, the term "alkyl" includes both saturated straight chain and branched alkyl groups which may be substituted (mono- or poly-) or unsubstituted. In some embodiments the alkyl group is a C_{1-10} alkyl group. In some embodiments the alkyl group is a C_{1-8} alkyl group. In some embodiments the alkyl group is a C_{1-6} alkyl group. In some embodiments the alkyl group is a C_{1-3} alkyl group. In some embodiments the alkyl groups include, for example, methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, pentyl and hexyl. In some embodiments the alkyl groups include methyl, ethyl, propyl or isopropyl.

[0162] As used herein, the term "alkenyl" includes both unsaturated straight chain and branched alkenyl groups which may be substituted (mono- or poly-) or unsubstituted. In some embodiments the alkenyl group is a C_{2-10} alkenyl group. In some embodiments the alkenyl group is a C_{2-8} alkenyl group. In some embodiments the alkenyl group is a C_{2-6} alkenyl group.

[0163] As used herein, the term "aryl" refers to a C_{6-12} aromatic group which may be substituted (mono- or poly-) or unsubstituted. Typical examples include phenyl and naphthyl etc. In some embodiments the aryl group is phenyl.

[0164] The term "aralkyl" is used as a conjunction of the terms alkyl and aryl as given above. For example, an aryl group may be bonded to the compound of formula (I) through a diradical alkylene bridge, $(-CH_2-)_n$, where n is 1-10 and where "aryl" is as defined above. Alternatively, an alkyl group may be bonded to the compound of formula (I) through a diradical aryl bridge, e.g. phenyl, where "alkyl is as defined above. In some embodiments the term "aralkyl" refers to a phenyl-alkyl group where the phenyl is bonded to the compound of formula (I).

[0165] As used herein the term "heteroaryl" refers to a monovalent aromatic group of from 1 to 12 carbon atoms having one or more oxygen, nitrogen, and sulfur heteroatoms within the ring. In some embodiments there are 1 to 4 oxygen, nitrogen and/or sulfur heteroatoms within the ring. In some embodiments there are 1 to 3 oxygen, nitrogen and/or sulfur heteroatoms within the ring. In some embodiments there are 2 oxygen and/or nitrogen heteroatoms within the ring. In some embodiments there is 1 oxygen or nitrogen heteroatom within the ring. The nitrogen and sulfur heteroatoms may optionally be oxidized. Such heteroaryl groups can have a single ring (e.g., pyridyl or furyl) or multiple condensed rings provided that the point of attachment is through a heteroaryl ring atom.

[0166] In some embodiments the heteroaryl is selected from the group consisting of pyridyl, pyridazinyl, pyrimidinyl, pyrazinyl, triazinyl, pyrrolyl, indolyl, quinolinyl, isoquinolinyl, quinazolinyl, quinoxalinnyl, furanyl, thiophenyl, furyl, pyrrolyl, imidazolyl, oxazolyl, isoxazolyl, isothiazolyl, pyrazolyl benzofuranyl, and benzothiophenyl. Heteroaryl rings may be unsubstituted or substituted. In some embodiments the heteroaryl is selected from the group consisting of pyridyl, pyridazinyl, pyrimidinyl, pyrazinyl, triazinyl and pyrrolyl. In some embodiments the heteroaryl is pyridyl.

[0167] As used herein the term "heterocyclyl" refers to fully saturated or unsaturated, monocyclic groups, which have one or more oxygen, sulfur or nitrogen heteroatoms in the ring. In some embodiments the heterocyclyl has 1 to 3 heteroatoms in the ring. In some embodiments the heterocyclyl has 1 to 3 oxygen and/or nitrogen heteroatoms in the ring. In some embodiments the heterocyclyl has 1 to 3 oxygen heteroatoms in the ring. The nitrogen and sulfur heteroatoms may optionally be oxidized and the nitrogen heteroatoms may optionally be quaternized. The heterocyclic group may be unsubstituted or substituted.

[0168] Exemplary monocyclic heterocyclic groups include, but are not limited to, pyrrolidinyl, pyrrolyl, pyrazolyl, oxiranyl, oxetanyl, pyrazolinyl, imidazolyl, imidazolinyl, imidazolidinyl, oxazolyl, oxazolidinyl, isoxazolinyl, isoxazolyl, thiazolyl, thiadiazolyl, thiazolidinyl, isothiazolyl, isothiazolidinyl, furyl, tetrahydrofuryl, thienyl, oxadiazolyl, piperidinyl, piperazinyl, 2-oxopiperazinyl, 2-oxopiperidinyl, 2-oxopyrrolodinyl, 2-oxoazepinyl, azepinyl, 4-piperidonyl, pyridinyl, pyrazinyl, pyrimidinyl, pyridazinyl, tetrahydropyranyl, morpholinyl, thiamorpholinyl, thiamorpholinyl sulfoxide, thiamorpholinyl sulfone, 1,3-dioxolane and tetrahydro-1,1-dioxothienyl, triazolyl, and triazinyl.

[0169] In some embodiments the heterocyclyl is selected from the group consisting of oxiranyl, oxetanyl, tetrahydrofuryl, tetrahydropyranyl, and 1,3-dioxolane. In some embodiments the heterocyclyl is 1,3-dioxolane.

[0170] All embodiments include, where appropriate, all enantiomers, tautomers and geometric isomers of the compounds of formula (VI). The person skilled in the art will recognise compounds that possess optical properties (one or more chiral carbon atoms) or tautomeric characteristics. The corresponding enantiomers and/or tautomers may be isolated/-prepared by methods known in the art. Some of the compounds of formula (VI) may also exist as stereoisomers and/or geometric isomers - e.g. they may possess one or more asymmetric and/or geometric centres and so may exist in two or more stereoisomeric and/or geometric forms. All embodiments include, where appropriate, the use of all the individual stereoisomers and geometric isomers of those compounds, and mixtures thereof. The terms used in the claims encompass these forms.

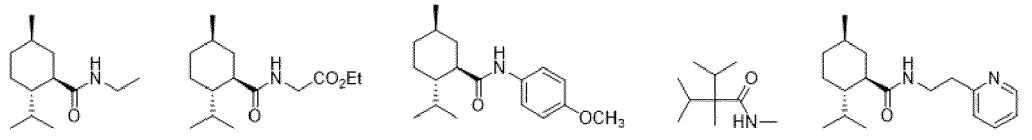
[0171] Suitable salts of the compounds of formula (VI) include suitable acid addition or base salts thereof. Such salts and solvates thereof will be known in the art. Suitable acid addition salts include carboxylate salts (e.g. formate, acetate, trifluoroacetate, propionate, isobutyrate, heptanoate, decanoate, caprate, caprylate, stearate, acrylate, caproate, propiolate, ascorbate, citrate, glucuronate, glutamate, glycolate, α-hydroxybutyrate, lactate, tartrate, phenylacetate, mandelate, phenylpropionate, phenylbutyrate, benzoate, chlorobenzoate, methylbenzoate, hydroxybenzoate, methoxy-

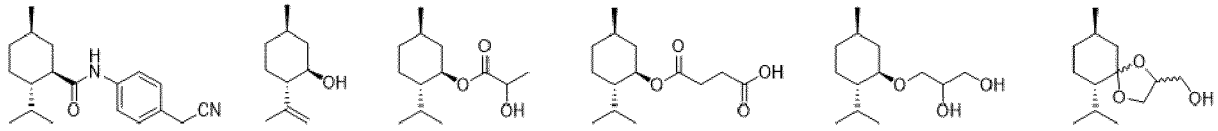
benzoate, dinitrobenzoate, o-acetoxybenzoate, salicylate, nicotinate, isonicotinate, cinnamate, oxalate, malonate, succinate, suberate, sebacate, fumarate, malate, maleate, hydroxymaleate, hippurate, phthalate or terephthalate salts), halide salts (e.g. chloride, bromide or iodide salts), sulfonate salts (e.g. benzenesulfonate, methyl-, bromo- or chlorobenzenesulfonate, xylenesulfonate, methanesulfonate, ethanesulfonate, propanesulfonate, hydroxyethanesulfonate, 1- or 2- naphthalene-sulfonate or 1,5-naphthalenedisulfonate salts) or sulfate, pyrosulfate, bisulfate, sulfite, bisulfite, phosphate, monohydrogenphosphate, dihydrogenphosphate, metaphosphate, pyrophosphate or nitrate salts.

[0172] In some embodiments, the one or more sensates comprises a cooling agent which is selected from the group consisting of: menthol, N-ethyl-5-methyl-2-(propan-2-yl) cyclohexanecarboxamide, ethyl-2-(5-methyl-2-propan-2-yl cyclohexanecarbonyl amino) acetate, N-(4-methoxyphenyl)-p-menthanecarboxamide, N-2,3-trimethyl-2-propan-2-yl butanamide, N-(2-pyridin-2-yl)ethyl)menthyl carboxamide, menthone-1,2-glycerol ketal, menthyl lactate, isopulegol, 3-menthoxypropan-1,2-diol, and menthyl succinate.

[0173] In some embodiments the cooling agent is selected from the group consisting of: menthol, N-ethyl-5-methyl-2-(propan-2-yl) cyclohexanecarboxamide, ethyl-2-(5-methyl-2-propan-2-yl cyclohexanecarbonyl amino) acetate, N-(4-methoxyphenyl)-p-menthanecarboxamide, N-2,3-trimethyl-2-propan-2-yl butanamide, N-(2-pyridin-2-yl)ethyl) menthyl carboxamide, menthone-1,2-glycerol ketal, menthyl lactate, 3-menthoxypropan-1,2-diol, and menthyl succinate.

[0174] In some embodiments, the cooling agent is selected from the group consisting of:





[0175] In some embodiments the cooling agent is WS-23, i.e. N,2-3-trimethyl-2-propan-2-ylbutanamide.

[0176] In some embodiments the cooling agent is selected from the group consisting of (1S,2R,5S)-N-ethyl-5-methyl-2-(propan-2-yl)cyclohexanecarboxamide, ethyl-2-[[(1R,2S,5R)-5-methyl-2-propan-2-ylcyclohexanecarbonyl] amino] acetate, (1R,2S,5R)-N-(4-methoxyphenyl-p-menthanecarboxamide, (1R,2S,5R)-N-(2-(pyridin-2-yl)ethyl) menthylcarboxamide, (-)-menthone 1,2-glycerol ketal, (-)-menthyl lactate, (-)-isopulegol, 3-((-)-menthoxy)propane-1,2-diol, and (-)-menthyl succinate.

[0177] In some embodiments the cooling agent is selected from the group consisting of (1S,2R,5S)-N-ethyl-5-methyl-2-(propan-2-yl)cyclohexanecarboxamide, ethyl-2-[[(1R,2S,5R)-5-methyl-2-propan-2-ylcyclohexanecarbonyl] amino] acetate, (1R,2S,5R)-N-(4-methoxyphenyl-p-menthanecarboxamide, (1R,2S,5R)-N-(2-(pyridin-2-yl)ethyl) menthylcarboxamide, (-)-menthone 1,2-glycerol ketal, (-)-menthyl lactate, 3-((-)-menthoxy)propane-1,2-diol, and (-)-menthyl succinate.

[0178] In some embodiments the cooling agent is selected from the group consisting of (1S,2R,5S)-N-ethyl-5-methyl-2-(propan-2-yl)cyclohexanecarboxamide, ethyl-2-[[(1R,2S,5R)-5-methyl-2-propan-2-ylcyclohexanecarbonyl] amino] acetate, (1R,2S,5R)-N-(4-methoxyphenyl-p-menthanecarboxamide, (1R,2S,5R)-N-(2-(pyridin-2-yl)ethyl) menthylcarboxamide, (-)-menthone 1,2-glycerol ketal, (-)-menthyl lactate, (-)-isopulegol, and 3-((-)-menthoxy)propane-1,2-diol.

[0179] In some embodiments the cooling agent is selected from the group consisting of (1S,2R,5S)-N-ethyl-5-methyl-2-(propan-2-yl)cyclohexanecarboxamide, ethyl-2-[[(1R,2S,5R)-5-methyl-2-propan-2-ylcyclohexanecarbonyl] amino] acetate, ((1R,2S,5R)-N-(2-(pyridin-2-yl)ethyl)menthylcarboxamide, (-)-menthone 1,2-glycerol ketal, (-)-menthyl lactate, (-)-isopulegol, and 3-((-)-menthoxy)propane-1,2-diol.

[0180] In some embodiments the cooling agent is selected from the group consisting of (1S,2R,5S)-N-ethyl-5-methyl-2-(propan-2-yl)cyclohexanecarboxamide, ethyl-2-[[(1R,2S,5R)-5-methyl-2-propan-2-ylcyclohexanecarbonyl] amino] acetate, ((1R,2S,5R)-N-(2-(pyridin-2-yl)ethyl)menthylcarboxamide, (-)-menthone 1,2-glycerol ketal, (-)-menthyl lactate, and 3-((-)-menthoxy)propane-1,2-diol.

[0181] In some embodiments the cooling agent is (1R,2S,5R)-N-(2-(pyridin-2-yl)ethyl)menthylcarboxamide. In another embodiment the cooling agent is (1S,2R,5S)-N-ethyl-5-methyl-2-(propan-2-yl)cyclohexanecarboxamide. As noted above, all embodiments include, where appropriate, all enantiomers and tautomers of the compounds. All embodiments

include, where appropriate, the use of all the individual stereoisomers and geometric isomers of those compounds, and mixtures thereof. The terms used in the claims encompass these forms.

[0182] In some embodiments the consumable further comprises one or more compounds selected from acetic acid, 2-methylbutanoic acid, 3-methylbutanoic acid, 3-methylpentanoic acid, butanoic acid, β-damascenone, β-ionone, α-ionone, α-ionol, β-cyclocitral, safranal, maltol, ethyl maltol, 2-methoxyphenol, 4-methyl-2-methoxyphenol, 3-hydroxy-4,5-dimethyl-2(5H)-furanone, phenylacetic acid, cyclotene, ethyl cyclotene, coronol, mesifurane, maple furanone, benzaldehyde, 4-propyl-2-methoxyphenol, 4-allyl-2,6-dimethoxyphenol, 3-methyl-2,4-nonandione, 5,6,7-trimethylocta-2,5-dien-4-one, or a combination thereof. The above-noted concentration range applies to the inclusion of one or more of these compounds. In some embodiments the consumable further comprises at least one compound selected from compounds A, B, C, D, E and a combination thereof. Each of Compounds A, B, C, D and E are defined below.

Compound A

[0183] In some embodiments A is at least one compound selected from acetic acid, 2-methylbutanoic acid, 3-methylbutanoic acid, 3-methylpentanoic acid, and butanoic acid. In some embodiments, compound A is 3-methylbutanoic acid, also known as isovaleric acid. In some embodiments, compound A is acetic acid. In some embodiments, compound A is 3-methyl pentanoic acid, also known as 3-methylvaleric acid. In some embodiments, compound A is 2-methylbutanoic acid. In some embodiments, compound A is butyric acid, also known as butanoic acid. In some embodiments, A is at least acetic acid and 2-methylbutanoic acid.

Compound B

[0184] In some embodiments, B is at least one compound selected from β-damascone, β-damascenone β-ionone, α-ionone, α-ionol, β-cyclocitral, and safranal. In some embodiments, B is at least two compounds selected from β-damascone, β-damascenone and β-ionone, α-ionone, α-ionol, β-cyclocitral, and safranal. In some embodiments, B is at least β-damascone, β-damascenone and β-ionone.

Compound C

[0185] In some embodiments, C is at least one compound selected from maltol, ethyl maltol, and sotolone. In some embodiments C is at least two compounds selected from maltol, ethyl maltol and sotolone.

Compound D

[0186] In some embodiments D is at least one compound selected from 2-methoxyphenol, 4-methyl-2-methoxyphenol, 4-propyl-2-methoxyphenol, 2,6-dimethoxyphenol, phenylacetic acid, 3-hydroxy-4,5-dimethyl-2(5H)-furanone, cyclotene, ethyl cyclotene, coronol, mesifurane, maple furanone, 4-propyl-2-methoxyphenol, benzaldehyde, and 4-allyl-2,6-dimethoxyphenol.

Compound E

[0187] In some embodiments, E is at least one compound selected from 3-methyl-2,4-nonandione and 5,6,7-trimethylocta-2,5-dien-4-one.

[0188] In some embodiments, the consumable comprises three or more compounds selected from compounds A, B, C, D and E, wherein each of A, B, C, D and E are as defined herein. In some embodiments, the consumable comprises four or more compounds selected from compounds A, B, C, D and E, wherein each of A, B, C, D and E are as defined herein. In some embodiments, the consumable comprises at least compounds A, B, C, and D wherein each of A, B, C, and D are as defined herein. In some embodiments, the consumable comprises a compound from each of compounds A, B, C, D and E, wherein each of A, B, C, D and E are as defined herein.

[0189] In some embodiments, where two or more different A compounds are present, they may be selected from two or more of the group consisting of acetic acid, 3-methylbutanoic acid, 3-methyl pentanoic acid, 2-methylbutanoic acid, and butyric acid. In some embodiments, where two or more different A compounds are present, they are at least butyric acid and 3-methylbutanoic acid.

[0190] The consumable may also comprise, in addition to compounds A, B, C and D, one or more of the following compounds falling within component E: 3-methyl-2,4-nonandione and 5,6,7-Trimethylocta-2,5-dien-4-one.

[0191] When present, compounds A, C and D may be present, relative to compound B (total B components), in the following weight ratios: A:B is from 5 to 10:1; C:B is from 5 to 10:1; and D:B is from 10 to 15:1. In some embodiments, compounds A, C and D may be present, relative to compound B (total B compounds), in the following weight ratios: A:B is

from 1 to 5:1; C:B is from 1 to 5:1; and D:B is from 5 to 10:1. In some embodiments, compounds A, C and D may be present, relative to compound B (total B compounds), in the following weight ratios: A:B is from 5 to 10:1; C:B is from 15 to 25:1; and D:B is from 5 to 10:1.

[0192] The consumable of the present disclosure is particularly suitable for producing a tobacco-like aroma. Furthermore, it has been found that such consumables do not need to be even partly or entirely extracted from tobacco in order to provide such an aroma. Consequently, the consumable of the present disclosure may not, in some embodiments, be derived from tobacco extracts. It is thought that during the process of extracting compounds from tobacco, other impurities (i.e. compounds in addition to the target compound), may be present. It is either impossible or very difficult to completely eliminate such impurities from an extraction which may be problematic for various reasons. As a result, the consumable of the present disclosure may have the advantage that it need not contain additional compounds which do not contribute significantly to the provision of a tobacco-like aroma yet which may be present in a composition derived from tobacco.

[0193] Owing to the consumable optionally not being derived directly from an extract, it is typically the case that the consumable comprises a relatively few number of compounds. For example, in some embodiments, the consumable consists essentially of four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen, or fifteen compounds. These compounds may be those defined in Claim 1. In some embodiments, the consumable consists essentially of 15 or less compounds, such as 14 or less compounds, such as 13 or less compounds, such as 12 or less compounds, such as 11 or less compounds, such as 10 or less compounds, such as 9 or less compounds, such as 8 or less compounds, such as 7 or less compounds, such as 6 or less compounds, such as 5 or less compounds.

Aerosolisable Formulation

[0194] In some embodiments there is provided an aerosolisable formulation for an aerosol provision system comprising the consumable as defined herein, a carrier or a binder, and optionally nicotine. In some embodiments the formulation comprises the consumable as defined herein, a carrier and nicotine. In some embodiments, the formulation comprises the consumable as defined herein, a binder and nicotine.

[0195] In some embodiments the formulation comprises the consumable in an amount of at least about 1% by weight, such as at least about 5 wt% by weight, or even at least about 10 wt% by weight. The consumable may be present in the formulation in an amount of no greater than about 25% by weight, such as no greater than about 20% by weight, or even no greater than about 15 wt% by weight.

[0196] In some embodiments the consumable may be present in the formulation in an amount of from about 1% by weight to about 25% by weight, such as from about 5 wt% by weight to about 20% by weight, even from about 10% by weight to about 15% by weight.

[0197] The aerosolisable formulation may take various forms including a gel, a liquid or a solid. In some preferred embodiments, the aerosolisable formulation is a liquid. In other preferred embodiments, the aerosolisable formulation is a gel. In some embodiments the consumable is in the form of a liquid or gel.

[0198] In some embodiments the aerosolisable formulation may be described as an aerosol-generating material and may be an "amorphous solid". In some embodiments, the amorphous solid is a "monolithic solid". The aerosol-generating material may be non-fibrous or fibrous. In some embodiments, the aerosol-generating material may be a dried gel. The aerosol-generating material may be a solid material that may retain some fluid, such as liquid, within it. In some embodiments, the retained fluid may be water (such as water absorbed from the surroundings of the aerosol-generating material) or the retained fluid may be solvent (such as when the aerosol-generating material is formed from a slurry). In some embodiments, the solvent may be water.

[0199] In some embodiments, the aerosol generating material may comprise, or be, a collection of individual sheets of material. For example, the aerosol generating material may comprise a sheet comprising a fibrous material comprising a botanical material, such as tobacco material. The sheet may be in the form of a wrapper; it may be gathered to form a gathered sheet or it may be shredded to form a shredded sheet. The shredded sheet may comprise one or more strands or strips of aerosol generating material.

[0200] In some embodiments the aerosol-generating material is in the form of a gathered sheet, elongate strips, or a shredded sheet.

[0201] In some embodiments, the shredded sheet comprises a plurality (e.g. two or more) strands or strips of the aerosol-generating material. Where the shredded sheet comprises a plurality of strands or strips of material, the dimensions of each strand or strip may vary between different strands or strips. For example, the shredded sheet may comprise a first population of strands or strips and a second population of strands or strips, wherein the dimensions of the strands or strips of the first population are different to the dimensions of the strands or strips of the second population. In other words, the plurality of strands or strips may comprise a first population of strands or strips having a first aspect ratio and a second population of strands or strips having a second aspect ratio that is different to the first aspect ratio.

[0202] A first dimension, or cut width, of the strands or strips of aerosolisable material is between 0.9 mm and 1.5 mm. When strands or strips of aerosolisable material have a cut width of below 0.9 mm are incorporated into an article for use in

a non-combustible aerosol provision system, the pressure drop across the article may be increased to a level that renders the article unsuitable for use in a non-combustible aerosol-provision device. However, if the strands or strips have a cut width above 2 mm (e.g. greater than 2 mm), then it may be challenging to insert the strands or strips of aerosolisable material into the article during its manufacture. In a preferred embodiment, the cut width of the strands or strips of aerosolisable material is between about 1 mm and 1.5 mm.

[0203] The consumable as defined herein could be incorporated into these materials by spraying onto the sheet/shreds/strands or they could be incorporated into the slurry during their manufacture (not for leaf, though, which comes from the field and is processed, shredded and blended.

Carrier

[0204] When the aerosolisable formulation is a liquid, the carrier of the formulation may be any suitable solvent such that the formulation can be vaporised for use. In some embodiments the solvent is selected from glycerol, propylene glycol, water, and mixtures thereof. In some embodiments the solvent is selected from glycerol, propylene glycol and mixtures thereof. In some embodiments the solvent is at least glycerol. In some embodiments the solvent consists essentially of glycerol. In some embodiments the solvent consists of glycerol. In some embodiments the solvent is at least propylene glycol. In some embodiments the solvent consists essentially of propylene glycol. In some embodiments the solvent consists of propylene glycol. In some embodiments the solvent is at least a mixture of propylene glycol and glycerol. In some embodiments the solvent consists essentially of a mixture of propylene glycol and glycerol. In some embodiments the solvent consists of a mixture of propylene glycol and glycerol.

[0205] The carrier of the formulation may be present in any suitable amount. In some embodiments the carrier is present in an amount of about 50 wt% or more. In some embodiments the carrier is present in an amount of about 70 wt% or more, based on the total weight of the formulation. In some embodiments the carrier is present in an amount of about 50 to about 99 wt% based on the total weight of the formulation, such as about 60 to about 98 wt% based on the formulation, even about 70 to about 95 wt% based on the formulation.

[0206] In some embodiments the formulation is a liquid and comprises about 1% to about 25% by weight of the consumable, about 50 to about 99% by weight of the carrier, and optionally nicotine, such as about 5 wt% by weight to about 20% by weight of the consumable, about 60% to about 98% by weight of the carrier, and optionally nicotine, even about 10% by weight to about 15% by weight of the consumable, about 70% to about 95% by weight of the carrier, and optionally nicotine.

[0207] When the aerosolisable formulation is in the form of a solid, including in the form of the aerosol-generating material described above, the formulation or material may be present on or in a carrier which acts as a support. The carrier may function as a support on which the aerosol-generating material is formed, thereby easing manufacture. The carrier may also provide rigidity to the aerosol-generating material, easing handling.

[0208] The carrier may be any suitable material which can be used to support an aerosol-generating material. In some cases, the carrier may be formed from materials selected from metal foil, paper, carbon paper, greaseproof paper, ceramic, carbon allotropes, such as graphite and graphene, plastic, cardboard, wood or combinations thereof. In some cases, the carrier may be formed from materials selected from metal foil, paper, cardboard, wood or combinations thereof. In some cases, the carrier comprises paper. In some cases, the carrier itself may be a laminate structure comprising layers of materials selected from the preceding lists. In some cases, the carrier may also function as a flavour support. For example, the carrier may be impregnated with a flavourant. The carrier may also function as a support for the consumable defined herein (which, as noted herein, may be considered a 'flavour block').

Nicotine

[0209] Nicotine may be provided in any suitable amount depending on the desired dosage when the formulation is aerosolised and inhaled by the user. In some embodiments nicotine is present in an amount of no greater than about 6 wt% based on the total weight of the formulation. In some embodiments nicotine is present in an amount of from about 0.1 to about 6 wt% based on the total weight of the formulation, such as from about 0.5 to about 6 wt% based on the total weight of the formulation, even about 0.5 to about 5 wt% based on the total weight of the formulation.

[0210] In some embodiments the aerosolisable formulation is a liquid and may comprise about 1% to about 25% by weight of the consumable, where the consumable is defined according to the embodiments above, about 50 to about 99 wt% of the carrier, and about 0.1 to about 6 wt% of nicotine. In some embodiments the aerosolisable formulation is a liquid and may comprise about 5% by weight to about 20% by weight of the consumable, where the consumable is defined according to the embodiments above, about 60 to about 98 wt% of the carrier, and about 0.5 to about 6 wt% of nicotine. In some embodiments the aerosolisable formulation is a liquid and may comprise about 10% by weight to about 15% by weight of the consumable, where the consumable is defined according to the embodiments above, about 70 to about 95 wt% of the carrier, and about 0.5 to about 5 wt% of nicotine.

[0211] In some embodiments the formulation may contain one or more acids in addition to nicotine (as the active agent). In some embodiments, the one or more acids may be one or more organic acids. In some embodiments, the one or more acids may be one or more organic acids selected from the group consisting of benzoic acid, levulinic acid, malic acid, maleic acid, fumaric acid, citric acid, lactic acid, acetic acid, succinic acid, and mixtures thereof. When included in the formulation in combination with nicotine, the one or more acids may provide a formulation in which the nicotine is at least partially in protonated (such as monoprotonated and/or diprotonated) form. In some embodiments the one or more acids comprises benzoic acid and/or levulinic acid. In some embodiments the one or more acids comprises benzoic acid.

Binder

[0212] In some embodiments there is provided an aerosolisable formulation comprising the consumable as defined herein, one or more binders, and optionally a botanical material. In some embodiments, the binder consists of one or more gelling agent(s). Suitably, the aerosolisable formulation comprises from about 2 wt% to about 80 wt% binder(s), for example from about 5 wt%, 7 wt%, 10 wt%, 15 wt%, 17 wt%, 20 wt%, or 25 wt% to about 70 wt%, 60 wt%, 50 wt%, 45 wt%, 40 wt%, 35 wt% or 30 wt% of one or more binders (all calculated on a dry weight basis). For example, the aerosolisable formulation may comprise about 5-70 wt%, 7-60 wt%, 10-50 wt%, 15-45 wt%, 17-40 wt%, 20-35 wt% or 25-30 wt% of the binder(s).

[0213] In some embodiments, the one or more binders comprises one or more gelling agent(s). In some embodiments, the one or more binders consist of one or more gelling agent(s). In some embodiments, the gelling agent comprises a hydrocolloid.

[0214] In some embodiments, the one or more binders comprises (or is) one or more compounds selected from polysaccharide gelling agents, such as alginate, pectin, starch or a derivative thereof, cellulose or a derivative thereof, pullulan, carrageenan, agar and agarose; gelatin; gums, such as xanthan gum, guar gum and acacia gum; silica or silicone compounds, such as PDMS and sodium silicate; clays, such as kaolin; and polyvinyl alcohol.

[0215] In some embodiments the one or more binders comprises (or is) one or more polysaccharide gelling agents. In some embodiments, the polysaccharide gelling agent is selected from alginate, pectin, starch or a derivative thereof, or cellulose or a derivative thereof. In some embodiments the polysaccharide gelling agent is selected from alginate and a cellulose derivative.

[0216] In some embodiments, the one or more binders is a polysaccharide gelling agent, optionally wherein the polysaccharide gelling agent is selected from alginate and a cellulose derivative. In some embodiments, the polysaccharide gelling agent is alginate. In some embodiments, the alginate is sodium alginate.

[0217] In some embodiments, the polysaccharide gelling agent is a cellulose derivative. Without wishing to be bound by theory, it is believed that such gelling agents do not react with calcium ions to form crosslinks. In some embodiments the binder is not cross-linked. The absence of crosslinks in the gelling agent may facilitate quicker delivery of the consumable (and any optional additional active substances and/or flavours) from the aerosolisable formulation.

[0218] Examples of cellulosic binders (also referred to herein as cellulosic gelling agents or cellulose derivatives) include, but are not limited to, hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethylcellulose (CMC), hydroxypropyl methylcellulose (HPMC), methyl cellulose, ethyl cellulose, cellulose acetate (CA), cellulose acetate butyrate (CAB), and cellulose acetate propionate (CAP). In some embodiments the cellulose or derivative thereof is selected from hydroxymethyl cellulose, hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethylcellulose (CMC), hydroxypropyl methylcellulose (HPMC), methyl cellulose, ethyl cellulose, cellulose acetate (CA), cellulose acetate butyrate (CAB), and cellulose acetate propionate (CAP). In some embodiments, the cellulose derivative is CMC. For example, in some embodiments, the binder comprises (or is) one or more of alginate, pectin, hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethylcellulose, pullulan, xanthan gum, guar gum, carrageenan, agarose, acacia gum, fumed silica, PDMS, sodium silicate, kaolin and polyvinyl alcohol.

[0219] In some embodiments, the binder comprises (or is) one or more of hydroxyethyl cellulose, hydroxypropyl cellulose, carboxymethylcellulose, guar gum, acacia gum, alginate and/or pectin.

[0220] In some cases, the binder comprises (or is) alginate and/or pectin, and may be combined with a setting agent (such as a calcium source) during formation of the aerosolisable formulation. In some cases, the binder may comprise a calcium-cross-linked alginate and/or a calcium-cross-linked pectin.

[0221] In some embodiments, the binder comprises (or is) alginate, optionally wherein the alginate is present in the aerosolisable formulation in an amount of from about 5-70 wt%, 7-60 wt%, 10-50 wt%, or 15-45 wt%, of the aerosolisable formulation (calculated on a dry weight basis).

[0222] In some embodiments, alginate is the only binder present in the aerosolisable formulation. In other embodiments, the binder comprises alginate and at least one further binder, such as pectin. In particular embodiments, the binder is carboxymethylcellulose, optionally wherein the carboxymethylcellulose (CMC) is present in an amount of about 2-80 wt%, for example about 5-70 wt%, 10-60 wt%, 15-50 wt%, 17-45 wt%, 20-40 wt% or about 30 wt%. In some embodiments, CMC is the only binder present in the aerosolisable formulation.

[0223] The aerosolisable formulation with one or more binders may be in the form of aerosol-generating material as defined above. In some embodiments the aerosol-generating material may comprise one or more binders and an aerosol-former material. The aerosol-former material may be as defined above and may be present in an amount of from about 1wt%, 5wt%, 10wt%, 12wt% or 13wt% to about 18wt%, 20wt%, 25wt%, 30wt%, 35wt%, 45wt%, 55wt%, 65wt%, 15 75wt% or 80wt% of an aerosol-former material (all calculated on a dry weight basis). In exemplary embodiments, the aerosol-generating material comprises from about 1 to about 80 wt%, from about 1 to about 50 wt%, from about 5 to about 35 wt%, from about 10 to about 25 wt%, from about 12 to about 20 wt% or from about 13 to about 18 wt% of an aerosol-former material (all calculated on a dry weight basis).

[0224] The aerosol-former material may comprise one or more of glycerol, propylene glycol, 1,3-propanediol, diethylene glycol, triethylene glycol, tetraethylene glycol, 1,3-butylene glycol, erythritol, meso-Erythritol, ethyl vanillate, ethyl laurate, a diethyl suberate, triethyl citrate, triacetin, a diacetin mixture, benzyl benzoate, benzyl phenyl acetate, tributyrin, lauryl acetate, lauric acid, myristic acid, and propylene carbonate.

[0225] In some embodiments, the aerosol-former material comprises one or more polyhydric alcohols, such as propylene glycol, triethylene glycol, 1,3-butanediol and glycerine esters of polyhydric alcohols, such as glycerol mono-, di- or triacetate; and/or aliphatic esters of mono, di- or polycarboxylic acids, such as dimethyl dodecanedioate and dimethyl tetradecanedioate In some embodiments the aerosol-former material may comprise glycerol and/or propylene glycol.

Filler

[0226] The aerosolisable formulation may further comprise a filler. Use of a filler may help to reduce tackiness of the aerosolisable formulation, for example if high levels of aerosol-former material are present. Suitably, the aerosolisable formulation comprises from about 2 wt% to about 60 wt% binder and any optional filler.

[0227] In some embodiments, filler is present in an amount of less than about 50 wt% of a filler, such as from about 1 wt% to 50 wt%, or 5 wt% to 40 wt%, or 5 wt% to 30 wt%, or 10 wt% to 20 wt%. In other embodiments, filler is present in an amount of less than 20 wt%, suitably less than 10 wt% or less than 5 wt%. In some cases, the aerosolisable formulation comprises less than 1 wt% of a filler, and in some cases, comprises no filler.

[0228] The filler, if present, may comprise one or more inorganic filler materials, such as calcium carbonate, perlite, vermiculite, diatomaceous earth, colloidal silica, magnesium oxide, magnesium sulphate, magnesium carbonate, and suitable inorganic sorbents, such as molecular sieves. The filler may comprise one or more organic filler materials such as wood pulp; tobacco pulp; hemp fibre; starch and starch derivatives, such as maltodextrin; chitosan; and cellulose and cellulose derivatives, such as ground cellulose, microcrystalline cellulose and nanocrystalline cellulose. In particular cases, the aerosolisable formulation comprises no calcium carbonate such as chalk.

[0229] In particular embodiments which include filler, the filler is fibrous. For example, the filler may be a fibrous organic filler material such as wood pulp, tobacco pulp, hemp fibre, cellulose or cellulose derivatives. In some embodiments, the fibrous organic filler material may be wood pulp, hemp fibre, cellulose or cellulose derivatives. In some embodiments, the fibrous filler is wood pulp. Without wishing to be bound by theory, it is believed that including fibrous filler in an aerosolisable formulation may increase the tensile strength of the material. This may be particularly advantageous in examples wherein the aerosolisable formulation is provided as a sheet, such as when a sheet circumscribes a rod of aerosolisable or aerosol generating material.

Botanical material

[0230] In some embodiments the aerosolisable formulation includes a botanical material. As used herein, the term "botanical" includes any material derived from plants including, but not limited to, extracts, leaves, bark, fibres, stems, roots, seeds, flowers, fruits, pollen, husk, shells or the like. Alternatively, the material may comprise an active compound naturally existing in a botanical, obtained synthetically. The material may be in the form of liquid, gas, solid, powder, dust, crushed particles, granules, pellets, shreds, strips, sheets, or the like.

[0231] Example botanicals are tobacco, eucalyptus, star anise, hemp, cocoa, cannabis, fennel, lemongrass, peppermint, spearmint, rooibos, chamomile, flax, ginger, ginkgo biloba, hazel, hibiscus, laurel, licorice (liquorice), matcha, mate, orange skin, papaya, rose, sage, tea such as green tea or black tea, thyme, clove, cinnamon, coffee, aniseed (anise), basil, bay leaves, cardamom, coriander, cumin, nutmeg, oregano, paprika, rosemary, saffron, lavender, lemon peel, mint, juniper, elderflower, vanilla, wintergreen, beefsteak plant, curcuma, turmeric, sandalwood, cilantro, bergamot, orange blossom, myrtle, cassis, valerian, pimento, mace, damien, marjoram, olive, lemon balm, lemon basil, chive, carvi, verbena, tarragon, geranium, mulberry, ginseng, theanine, theacrine, maca, ashwagandha, damiana, guarana, chlorophyll, baobab or any combination thereof. The mint may be chosen from the following mint varieties: Mentha Arventis, Mentha c.v.,Mentha niliaca, Mentha piperita, Mentha piperita citrata c.v.,Mentha piperita c.v, Mentha spicata crispa, Mentha cardifolia, Memtha longifolia, Mentha suaveolens variegata, Mentha pulegium, Mentha spicata c.v. and Mentha suaveolens.

[0232] In some embodiments, the botanical is tobacco. In some embodiments, the botanical is selected from eucalyptus, star anise, cocoa and hemp. In some embodiments, the botanical is selected from rooibos and fennel.

Further Constituents

[0233] The aerosolisable formulation may comprise one or more further constituents. In particular, one or more further constituents may be selected from one or more active agents, and/or one or more functional constituents. In some embodiments, the active agent is a physiologically active agent and may be selected from nicotine, nicotine salts (e.g. nicotine ditartrate/nicotine bitartrate), nicotine-free tobacco substitutes, other alkaloids such as caffeine, or mixtures thereof. In other embodiments, the aerosolisable formulation is nicotine-free meaning that no nicotine is included in the aerosolisable formulation.

[0234] By "active agent" it is meant an agent which has a biological effect, such as sensorial and/or physiological effect, on a subject when the aerosol is inhaled. In one aspect by "active agent" it is meant an agent which has a physiological effect on a subject when the aerosol is inhaled. In some cases, the active may be a flavour. The active agent may also be selected from nutraceuticals, nootropics, psychoactives and sensates. In some embodiments, the active agent is selected from nutraceuticals, nootropics and psychoactives. The active substance may be naturally occurring or synthetically obtained. The active agent may comprise for example nicotine, caffeine, taurine, theine, vitamins such as B6 or B12 or C, melatonin, cannabinoids, or constituents, derivatives, or combinations thereof. The active agent may comprise one or more constituents, derivatives or extracts of tobacco, cannabis or another botanical. In some embodiments, the active agent comprises caffeine, melatonin or vitamin B12. The one or more active agents may be selected from nicotine, botanicals, and mixtures thereof. The one or more active agents may be of synthetic or natural origin. The active could be an extract from a botanical, such as from a plant in the tobacco family as discussed above. In one aspect the active agent is at least nicotine. In one aspect the active agent consists of nicotine and/or salts thereof as discussed above.

[0235] As noted herein, the active agent may comprise one or more constituents, derivatives or extracts of cannabis, such as one or more cannabinoids or terpenes. Cannabinoids are a class of natural or synthetic chemical compounds that act on cannabinoid receptors (i.e., CB1 and CB2) in cells that repress neurotransmitter release in the brain. Cannabinoids are cyclic molecules exhibiting particular properties such as the ability to cross the blood-brain barrier with ease. Cannabinoids may be naturally occurring (phytocannabinoids) from plants such as cannabis, (endocannabinoids) from animals, or artificially manufactured (synthetic cannabinoids). Cannabis species express at least 85 different phytocannabinoids, and these may be divided into subclasses, including cannabigerols, cannabichromenes, cannabidiols, tetrahydrocannabinols, cannabinols and cannabinodiols, and other cannabinoids, such as cannabigerol (CBG), cannabichromene (CBC), cannabidiol (CBD), tetrahydrocannabinol (THC), including its isomers ∆6a,10a-tetrahydrocannabinol (∆6a,10a-THC), ∆6a(7)-tetrahydrocannabinol (∆6a(7)-THC), ∆8-tetrahydrocannabinol (∆8-THC), ∆9-tetrahydrocannabinol (∆9-THC), ∆10-tetrahydrocannabinol (∆10-THC), ∆9,11-tetrahydrocannabinol (∆9,11-THC), cannabinol (CBN) and cannabinodiol (CBDL), cannabicyclol (CBL), cannabivarin (CBV), tetrahydrocannabivarin (THCV), cannabidivarin (CBDV), cannabichromevarin (CBCV), cannabigerovarin (CBGV), cannabigerol monomethyl ether (CBGM), cannabinerolic acid, cannabidiolic acid (CBDA), Cannabinol propyl variant (CBNV), cannabitriol (CBO), tetrahydrocannabinolic acid (THCA), and tetrahydrocannabivarinic acid (THCV A).

[0236] Although the legal status of specific cannabinoids varies from jurisdiction to jurisdiction, certain active components, for example cannabidiol (CBD), tetrahydrocannabinol (THC) and cannabinol (CBN), are being considered for use in a wide variety of applications, such as in formulations for use in aerosol delivery systems. However, the stability of cannabinoids, such as cannabidiol (CBD), tetrahydrocannabinol (THC) and cannabinol (CBN), has been found to vary depending on certain environmental conditions, such as exposure to air or light, or variation in temperature and pH. This may have unintended and detrimental consequences.

[0237] For example, CBD may oxidise and degrade when exposed to light and/or air to form cannabidiol hydroxyquinone (CBDHQ or HU-331) and its isomeric or functional derivatives. Furthermore, CBD may be converted to ∆9-tetrahydrocannabinol (∆9-THC) in response to variations in temperature and/or pH. As a result, the accuracy of the specified cannabinoid content and/or concentration may vary widely in the formulations, while regulated and restricted cannabinoids may be produced unintentionally that will render the product as illicit or unlicensed in certain jurisdictions. As such, there is a desire to provide formulations comprising one or more cannabinoids that maintain a high degree of purity during manufacture and storage, and in turn prevent the loss or degradation of one or more cannabinoids, such as cannabidiol (CBD), tetrahydrocannabinol (THC) or cannabinol (CBN), in a formulation.

[0238] In some embodiments, the cannabinoid is a synthetic cannabinoid. In some embodiments, the cannabinoid is added to the material in the form of an isolate. An isolate is an extract from a plant, such as a cannabis plant. The cannabinoid(s) of interest are typically present in a high degree of purity, for example greater than 95%, greater than 96%, greater than 97%, greater than 98%, or around 99% purity. A synthetic cannabinoid is one which has been derived from a chemical synthesis as opposed to being isolated from a plant or biological source.

[0239] In some embodiments the cannabinoid(s) of interest are selected from cannabigerol (CBG), cannabichromene

(CBC), cannabidiol (CBD), tetrahydrocannabinol (THC), including its isomers Δ6a,10a-tetrahydrocannabinol (Δ6a,10a-THC), Δ6a(7)-tetrahydrocannabinol (Δ6a(7)-THC), Δ8-tetrahydrocannabinol (Δ8-THC), Δ9-tetrahydrocannabinol (Δ9-THC), Δ10-tetrahydrocannabinol (Δ10-THC), Δ9,11-tetrahydrocannabinol (Δ9,11-THC), cannabinol (CBN) and cannabinodiol (CBDL), cannabicyclol (CBL), cannabivarin (CBV), tetrahydrocannabivarin (THCV), cannabidivarin (CBDV), cannabichromevarin (CBCV), cannabigerovarin (CBGV), cannabigerol monomethyl ether (CBGM), cannabinerolic acid, cannabidiolic acid (CBDA), cannabinol propyl variant (CBNV), cannabitriol (CBO), tetrahydrocannabinolic acid (THCA), and tetrahydrocannabivarinic acid (THCV A). In some embodiments the cannabinoid(s) of interest are selected from cannabigerol (CBG), cannabichromene (CBC), cannabidiol (CBD), Δ8-tetrahydrocannabinol (Δ8-THC), Δ9-tetrahydrocannabinol (Δ9-THC) and cannabinol (CBN).

[0240] In some embodiments the cannabinoid(s) of interest are selected from cannabidiol (CBD), Δ8-tetrahydrocannabinol (Δ8-THC), Δ9-tetrahydrocannabinol (Δ9-THC). In some embodiments the cannabinoid of interest is cannabidiol (CBD). In some embodiments the cannabinoid of interest is Δ8-tetrahydrocannabinol (Δ8-THC). In some embodiments the cannabinoid of interest is Δ9-tetrahydrocannabinol (Δ9-THC). In some embodiments the cannabinoid of interest is cannabinol (CBN).

[0241] As noted herein, the active agent may comprise or be derived from one or more botanicals or constituents, derivatives or extracts thereof. In some embodiments, the active agent comprises or is derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is tobacco. In some embodiments, the active agent comprises or is derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is selected from eucalyptus, star anise, cocoa and hemp. In some embodiments, the active agent comprises or is derived from one or more botanicals or constituents, derivatives or extracts thereof and the botanical is selected from rooibos and fennel.

[0242] When nicotine is present in the formulation, it may be present in protonated and/or unprotonated form. In some embodiments, the formulation comprises nicotine in unprotonated form and nicotine in monoprotonated form. It may also be that small amounts of diprotonated nicotine are present. In one aspect the formulation comprises nicotine in unprotonated form, nicotine in monoprotonated form and nicotine in diprotonated form.

[0243] As discussed herein the formulation may additionally comprise nicotine in unprotonated form and nicotine in protonated form. As will be understood by one skilled in the art, the protonated form of nicotine may be prepared by reacting unprotonated nicotine with an acid. The acid(s) are one or more suitable acids, such as organic acids. In some embodiments, the acid is a carboxylic acid. The carboxylic acid may be any suitable carboxylic acid. In some embodiments, the acid is a mono-carboxylic acid. In some embodiments, the acid is selected from the group consisting of acetic acid, benzoic acid, levulinic acid, lactic acid, formic acid, citric acid, pyruvic acid, succinic acid, tartaric acid, oleic acid, sorbic acid, propionic acid, phenylacetic acid, and mixtures thereof. In some embodiments, the acid is benzoic acid and/or levulinic acid. In some embodiments, the acid is benzoic acid.

[0244] In alternative embodiments, the aerosolisable formulation may be free of organic or inorganic acids and their corresponding salts. For example, the aerosolisable formulation may be free of carboxylic acids and free of phosphoric acids.

[0245] Where present, the amount of organic acid present may vary. The formulation may comprise from about 0.01 % to about 10% by weight of organic acid, present as one or more organic acids, based on the total weight of the formulation. In some embodiments, the formulation comprises at least about 0.01%, at least about 0.1 %, about 0.2%, about 0.3%, about 0.4%, about 0.5%, about 0.6%, about 0.7%, about 0.8%, about 0.9%, about 1%, about 2%, about 3%, about 4%, about 5%, about 6%, about 7%, about 8%, about 9%, or at least about 10% organic acid by weight, based on the total weight of the formulation. In some preferred embodiments, the formulation comprises from about 0.01% to about 5% by weight of organic acid. For example, the formulation comprises an organic acid in an amount of from about 0.1% to about 2.5% by weight of the formulation. In the case where a salt of an organic acid is added (e.g., citric acid anhydrate), the percent by weight is calculated based on the weight of the free acid, not including any counter-ion which may be present.

[0246] In some embodiments, the further constituent is selected from a "flavour" and/or "flavourant" which, where local regulations permit, may be used to create a desired taste or aroma in a product for adult consumers. It will be recognized by the person skilled in the art that a flavour or flavourant, in the context of the present disclosure, is not a sensate compound as defined herein. In some instances flavours or flavourants may include one or more of extracts (e.g., liquorice, hydrangea, Japanese white bark magnolia leaf, chamomile, fenugreek, clove, Japanese mint, aniseed, cinnamon, herb, wintergreen, cherry, berry, peach, apple, Drambuie, bourbon, scotch, whiskey, spearmint, peppermint, lavender, cardamom, celery, cascarilla, nutmeg, sandalwood, bergamot, geranium, honey essence, rose oil, vanilla, lemon oil, orange oil, cassia, caraway, cognac, jasmine, ylang-ylang, sage, fennel, pimento, anise, coriander, coffee, and other additives such as charcoal, chlorophyll, minerals, or botanicals. They may be imitation, synthetic or natural ingredients or blends thereof. They may be in any suitable form, for example, oil, liquid, or powder.

[0247] The flavour may be added to the aerosolisable formulation as part of a so-called "flavour block", where one or more flavours are blended together and then added to the aerosolisable material. The "flavour block" may be in addition to the consumable defined above, which may itself be a "flavour block".

[0248] Where present, a flavouring agent may be included in the formulation in an amount up to about 10% by weight, such as up to about 5% by weight, such as up to about 1% by weight of the formulation. In some embodiments, a flavouring agent is present in an amount of from about 0.01 % to about 5% by weight, preferably in an amount of from about 0.1% to about 2.5% by weight of the formulation, and more preferably in an amount of from about 0.25% to about 1% by weight of the formulation.

[0249] The one or more other functional constituents may comprise one or more of colouring agents, preservatives, binders and/or fillers. Fillers, for example, may fulfil multiple functions, such as enhancing certain organoleptic properties such as texture and mouthfeel, enhancing cohesiveness or compressibility of the product, and the like. More details are set out above. A binder (or combination of binders) may be employed in the product in certain embodiments, in amounts sufficient to provide the desired physical attributes and physical integrity to the product. More details are set out above. A colouring agent may be employed in amounts sufficient to provide the desired physical attributes to the product.

[0250] In some embodiments, the aerosolisable material comprises less than 12%w/w water. In some embodiments, the aerosolisable material comprises less than 11%w/w water. In some embodiments, the aerosolisable material comprises less than 10%w/w water. In some embodiments, the aerosolisable material comprises less than 5%w/w water. In some embodiments, the aerosolisable material comprises less than 1%w/w water. In some embodiments, the aerosolisable material comprises less than 0.5%w/w water. In some embodiments, the aerosolisable material comprises substantially no water.

[0251] Such embodiments may also be defined with the concentration of consumable, carrier, and/or nicotine according to the embodiments above. It will be appreciated that such features are not repeated here for conciseness.

[0252] As the aerosolisable formulation embodiments include the consumable as defined herein, it will be appreciated that the components of the consumable are as defined above. This definition is not repeated here for conciseness but is equally applicable to the description of the aerosolisable formulation.

Article, Aerosol Provision System and Container

[0253] In a further aspect there is provided an article comprising the aerosolisable formulation as defined herein. The article may be a container, such as a bottle, or may be a component for use with an aerosol provision device. For example, the article may comprise an area (store) for receiving the aerosolisable formulation defined herein, an aerosol generating component, an aerosol generating area, and optionally a mouthpiece.

[0254] In some embodiments, there is provided an article for use with an aerosol provision system, the article comprising a store comprising an aerosolisable formulation as defined herein, an aerosol generating component (such as a heater), an aerosol generating area, a transport element, and a mouthpiece. Aerosolisable material (aerosolisable formulation) may be transferred from the store for receiving an aerosolisable material to the aerosol generating component via a transport element, such as a wick, pump or the like. The skilled person is able to select suitable transport elements depending on the type of aerosolisable material that is to be transported and the rate at which it must be supplied. Particular mention may be made of transport elements, such as wicks, formed from fibrous materials, foamed materials, sintered materials, woven and non-woven materials.

[0255] An airflow pathway typically extends through the article (optionally via the device) to an outlet. The pathway is oriented such that generated aerosol is entrained in the airflow such that it can be delivered to the outlet for inhalation by a user.

[0256] In some embodiments, the aerosol generating component is a heater.

[0257] Typically, the area for receiving an aerosolisable material will allow for the article to be refilled with aerosolisable material as the aerosolisable material is depleted during use.

[0258] In a further aspect there is provided an aerosol provision system comprising an aerosol provision device and an article as defined herein. The aerosol provision system is preferably non-combustible. A non-combustible aerosol provision system is a system that releases compounds from an aerosol-generating material without combusting the aerosol-generating material, such as electronic cigarettes, tobacco heating products, and hybrid systems to generate aerosol using a combination of aerosol-generating materials. According to the present disclosure, a "non-combustible" aerosol provision system is one where a constituent aerosol-generating material of the aerosol provision system (or component thereof) is not combusted or burned in order to facilitate delivery of at least one substance to a user. The system may heat an aerosol-generating material or aerosolisable formulation or consumable thereof to a temperature of at least about 200°C. In some embodiments the aerosol provision system generates aerosol by heating to a temperature of about 250°C to about 400°C.

[0259] The aerosol provision system may also be referenced herein as an aerosol delivery system. In some embodiments, the delivery system is a non-combustible aerosol provision system, such as a powered non-combustible aerosol provision system. In some embodiments, the non-combustible aerosol provision system is an electronic cigarette, also known as a vaping device or electronic nicotine delivery system (END), although it is noted that the presence of nicotine in the aerosol-generating material is not a requirement.

[0260] In some embodiments, the non-combustible aerosol provision system is an aerosol-generating material heating system, also known as a heat-not-burn system. An example of such a system is a tobacco heating system.

[0261] In some embodiments, the non-combustible aerosol provision system is a hybrid system to generate aerosol using a combination of aerosol-generating materials, one or a plurality of which may be heated. Each of the aerosol-generating materials may be, for example, in the form of a solid, liquid or gel and may or may not contain nicotine. In some embodiments, the hybrid system comprises a liquid or gel aerosol-generating material and a solid aerosol-generating material. The solid aerosol-generating material may comprise, for example, tobacco or a non-tobacco product.

[0262] Typically, the non-combustible aerosol provision system may comprise a non-combustible aerosol provision device and a consumable for use with the non-combustible aerosol provision device. The consumable being as defined herein.

[0263] In some embodiments, the non-combustible aerosol provision system, such as a non-combustible aerosol provision device thereof, may comprise a power source and a controller. The power source may, for example, be an electric power source or an exothermic power source. In some embodiments, the exothermic power source comprises a carbon substrate which may be energised so as to distribute power in the form of heat to an aerosol-generating material or to a heat transfer material in proximity to the exothermic power source.

[0264] Figure 1 is a highly schematic diagram (not to scale) of an example aerosol provision system, such as an e-cigarette 10, to which embodiments are applicable although not limited. The e-cigarette has a generally cylindrical shape, extending along a longitudinal axis indicated by a dashed line (although aspects of the invention are applicable to e-cigarettes configured in other shapes and arrangements), and comprises two main components, namely an aerosol provision device 20 and an article 30.

[0265] The article 30 includes a store for aerosolisable material (source liquid) 38 containing an aerosolisable material (source liquid) from which an aerosol is to be generated. The article 30 further comprises an aerosol generating component (heating element or heater) 36 for heating aerosolisable material to generate the aerosol. A transport element or wicking element or wick 37 is provided to deliver aerosolisable material from the store 38 to the heating element 36. A part or parts of the wick 37 are in fluid communication with aerosolisable material in the store 38 and by a wicking or capillary action aerosolisable material is drawn along or through the wick 37 to a part or parts of the wick 37 which are in contact with the heater 36.

[0266] Vaporization of the aerosolisable material occurs at the interface between the wick 37 and the heater 36 by the provision of heat energy to the aerosolisable material to cause evaporation, thus generating the aerosol. The aerosolisable material, the wick 37 and the heater 36 may be collectively referred to as an aerosol or vapour source. The wick 37 and the heater 36 may be collectively referred to as a vaporizer or an atomiser 15. Typically, a single wick will be present, but it is envisaged that more than one wick could be present, for example, two, three, four or five wicks.

[0267] As described above, the wick may be formed a sintered material. The sintered material may comprise sintered ceramic, sintered metal fibers/powders, or a combination of the two. The (or at least one of/all of the) sintered wick(s) may have deposited thereon/embedded therein an electrically resistive heater. Such a heater may be formed from heat conducting alloys such as NiCr alloys. Alternatively, the sintered material may have such electrical properties such that when a current is passed there through, it is heated. Thus, the aerosol generating component and the wick may be considered to be integrated. In some embodiments, the aerosol generating component and the wick are formed from the same material and form a single component.

[0268] In some embodiments, the wick is formed from a sintered metal material and is generally in the form of a planar sheet. Thus, the wick element may have a substantially thin flat shape. For example, it may be considered as a sheet, layer, film, substrate or the like. By this it is meant that a thickness of the wick is less or very much less than at least one of the length and the width of the wick. Thus, the wick thickness (its smallest dimension) is less or very much less than the longest dimension.

[0269] The wick may be made of a homogenous, granular, fibrous or flocculent sintered metal(s) so as to form said capillary structure. Wick elements can be made from a conductive material which is a nonwoven sintered porous web structure comprising metal fibres, such as fibres of stainless steel. For example, the stainless steel may be AISI (American Iron and Steel Institute) 316L (corresponding to European standard 1.4404). The material's weight may be in the range of 100 - 300 g/m^2.

[0270] Where the wick is generally planar, the thickness of the wick may be in the range of 75 - 250 μm. A typical fibre diameter may be about 12 μm, and a typical mean pore size (size of the voids between the fibres) may be about 32 μm. An example of a material of this type is Bekipor (RTM) ST porous metal fibre media manufactured by NV Bekaert SA, Belgium, being a range of porous nonwoven fibre matrix materials made by sintering stainless steel fibres.

[0271] Note also that while the material is described as planar, this refers to the relative dimensions of the sheet material and the wick (a thickness many times smaller than the length and/or width) but does not necessarily indicate flatness, in particular of the final wick made from the material. A wick may be flat but might alternatively be formed from sheet material into a non-flat shape such as curved, rippled, corrugated, ridged, formed into a tube or otherwise made concave and/or convex.

[0272] The wick element may have various properties. It is formed from a porous material to enable the required wicking or capillary effect for drawing source liquid through it from a store for aerosolisable material (where the wick meets the aerosolisable material at a store contact site) to the vaporisation interface. Porosity is typically provided by a plurality of interconnected or partially interconnected pores (holes or interstices) throughout the material, and open to the outer surface of the material. Any level of porosity may be employed depending on the material, the size of the pores and the required rate of wicking. For example, a porosity of between 30% and 85% might be selected, such as between 40% and 70%, between 50% and 80%, between 35% and 75% or between 40% and 75%. This might be an average porosity value for the whole wick element, since porosity may or may not be uniform across the wick. For example, pore size at the store contact site might be different from pore size nearer to the heater.

[0273] It is useful for the wick to have sufficient rigidity to support itself in a required within the article. For example, it may be mounted at or near one or two edges and be required to maintain its position substantially without flexing, bending or sagging. As an example, porous sintered ceramic is a useful material to use as the wick element. Any ceramic with appropriate porosity may be used. If porous ceramic is chosen as the porous wick material, this is available as a powder which can be formed into a solid by sintering (heating to cause coalescence, possibly under applied pressure). Sintering then solidifies the ceramic to create the porous wick.

[0274] The article 30 further includes a mouthpiece 35 having an opening through which a user may inhale the aerosol generated by the vaporizer 15. The aerosol for inhalation may be described as an aerosol stream or inhalable airstream.

[0275] The aerosol delivery device 20 includes a power source (a re-chargeable cell or battery 14, referred to herein after as a battery) to provide power for the e-cigarette 10, and a controller (printed circuit board (PCB)) 28 and/or other electronics for generally controlling the e-cigarette 10. The aerosol delivery device can therefore also be considered as a battery section, or a control unit or section.

[0276] During operation of the device, the controller will determine that a user has initiated a request for the generation of an aerosol. This could be done via a button on the device which sends a signal to the controller that the aerosol generator should be powered. Alternatively, a sensor located in or proximal to the airflow pathway could detect airflow through the airflow pathway and convey this detection to the controller. A sensor may also be present in addition to the presence of a button, as the sensor may be used to determine certain usage characteristics, such as airflow, timing of aerosol generation etc.

[0277] For example, in use, when the heater 36 receives power from the battery 14, as controlled by the circuit board 28 possibly in response to pressure changes detected by an air pressure sensor (not shown), the heater 36 vaporizes aerosolisable material delivered by the wick 37 to generate the aerosol, and this aerosol stream is then inhaled by a user through the opening in the mouthpiece 35. The aerosol is carried from the aerosol source to the mouthpiece 35 along an air channel (not shown in Figure 1) that connects the aerosol source to the mouthpiece opening as a user inhales on the mouthpiece.

[0278] In this particular example, the device 20 and article 30 are detachable from one another by separation in a direction parallel to the longitudinal axis, as shown in Figure 1, but are joined together when the system 10 is in use by cooperating engagement elements 21, 31 (for example, a screw, magnetic or bayonet fitting) to provide mechanical and electrical connectivity between the device 20 and the article 30, in particular connecting the heater 36 to the battery 14. The battery may be charged as is known to one skilled in the art.

[0279] In some embodiments, the article comprises/forms a sealed container. For example, the sealed container may be hermetically sealed. The hermetically sealed container may comprise a blister pack with one or more hermetically sealed compartments for storage of one or more articles comprising the aerosolisable formulation described herein.

[0280] In some embodiments, the article comprises a housing within which the aerosolisable formulation is contained. The housing may be transparent such that the aerosolisable formulation can be viewed from outside of the housing. It may also be that the housing has a degree of opacity such that the passage of light through the housing is limited. This can be important so as to prevent light (such as ultra violet light) from entering the housing and compromising the stability of the aerosolisable material. In some embodiments, the housing is formed from a material which inhibits/prevents the passage of ultra violet light there through. In some embodiments, it may be that the sealed container mentioned above is formed from a material which has a degree of opacity such that the passage of light through the sealed container is limited. Further, the sealed container mentioned above may be formed from a material which inhibits/prevents the passage of ultra violet light there through. This may be in addition to said sealed container being hermetically sealed and/or comprising a blister pack with one or more hermetically sealed compartments for storage of one or more articles comprising the aerosolisable material described herein.

Process and Uses

[0281] In some embodiments described herein there is provided a process for forming an aerosol, the process comprising providing an aerosolisable formulation as defined herein and aerosolising the formulation. The process may alternatively comprise providing the aerosol provision system defined herein and aerosolising the formulation or

consumable in the system.

[0282] According to some embodiments, there is provided the use of a consumable as defined herein to modify at least one sensory property of an aerosolisable formulation, such as wherein the sensory property is flavour, and the flavour is modified relative to the aerosolisable formulation without the consumable.

[0283] In some embodiments, there is provided the use of a consumable as defined herein to modify aroma of an aerosolisable formulation, wherein the aroma is modified relative to the aerosolisable formulation without the consumable. In some embodiments the aroma is modified to replicate smoking a combustible tobacco product (e.g. a cigarette). The aroma may be described as tobacco-like.

[0284] In some embodiments, there is provided the use of a consumable as defined herein to modify the tobacco flavour intensity of an aerosolisable formulation. In some embodiments, the use comprises increasing the tobacco flavour intensity of the aerosolisable formulation relative to the formulation without the consumable.

[0285] In some embodiments, there is provided the use of a consumable as defined herein to modify or improve at least one sensory property selected from taste, mouthfeel, in-smoking experience, and a combination thereof, of an aerosolisable formulation. The mouthfeel and/or in-smoking experience may include saturation, aftertaste, impact and nicotine hit, to replicate smoking a combustible tobacco product (e.g. a cigarette). The modification or improvement may be relative to the aerosolisable formulation without the consumable.

[0286] In some embodiments the use comprises modifying or improving taste of the formulation to replicate smoking a combustible tobacco product (e.g. a cigarette). In some embodiments the use comprises modifying or improving mouthfeel of the formulation to replicate smoking a combustible tobacco product (e.g. a cigarette). In some embodiments the use comprises modifying or improving saturation to replicate smoking a combustible tobacco product (e.g. a cigarette). In some embodiments the use comprises modifying or improving aftertaste to replicate smoking a combustible tobacco product (e.g. a cigarette). In some embodiments the use comprises modifying or improving nicotine hit to replicate smoking a combustible tobacco product (e.g. a cigarette). In some embodiments the use comprises modifying or improving impact to replicate smoking a combustible tobacco product (e.g. a cigarette). In some embodiments the use comprises modifying or improving in-smoking experience to replicate smoking a combustible tobacco product (e.g. a cigarette). In some embodiments the use comprises improving nicotine sensation to replicate smoking a combustible tobacco product (e.g. a cigarette).

[0287] In each of these uses, the aerosolisable formulation may be characterized according to the features and embodiments defined herein for the formulation and/or consumable.

[0288] These sensory properties may be measured by a trained sensory panel. A trained sensory panel is a team of trained assessors who define the sensory attributes (e.g. flavour including taste and aroma, mouthfeel and/or in-smoking experience) which best describe products that are being evaluated. The trained sensory panel ideally consists of smokers and/or dualists (i.e. users of cigarettes and e-cigarettes).

Other Aspects

[0289] The present disclosure further provides a consumable for an aerosolisable formulation, wherein the consumable comprises (a) an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof; and (b) at least two further compounds selected from substituted pyrroles, substituted furans, substituted furanones, substituted pyridines, substituted pyrazines, rose ketones, acyclic monoterpenoids, and trisulfides, wherein the consumable does not include a sweetener. The aliphatic and/or alkoxy phenol, aliphatic aldehyde, substituted pyrrole, substituted furan, substituted furanones, substituted pyridine, substituted pyrazine, rose ketone, acyclic monoterpenoid, and trisulfide are as defined hereinabove. When such consumable is included in an aerosolisable formulation, the formulation similarly does not include a sweetener. The consumable and formulation may be described as "sweetener-free".

[0290] By the term "sweetener" is meant a substance used to make food or drink taste sweeter, used instead of sugar (sucrose), i.e. a sugar substitute. Sweeteners are easily recognised in the art and the term would be well-understood by the person skilled in the art. Examples of natural sweeteners include fructose, glucose, maltose, mannose, galactose, lactose, stevia, and the like. Examples of artificial sweeteners include sucralose, isomaltulose, maltodextrin, saccharin, aspartame, acesulfame K, neotame and the like. A sweetener may be defined as a compound that binds to T1R2 and/or T1R3. It will be appreciated by one skilled in the art that the expression "binds to T1R2 and/or T1R3" means a compound that binds to the T1R2 receptor and/or the T1R3 receptor. T1R2 is otherwise known as "Taste receptor type 1 member 2", it is a protein in humans that is encoded by the TAS1R2 gene. Similarly, T1R3 is otherwise known as "Taste receptor type 1 member 3", it is a protein that in humans is encoded by the TAS1R3 gene. The sweet taste receptor in humans is predominately formed as a dimer of T1R2 and T1R3. Natural sweeteners are, however, understood to interact with the orthosteric binding pocket of either T1R2 or T1R3.

[0291] Binding of sweet substances to the sweet receptors actives trimeric G protein(s) and generates second messengers in taste cells. Both cyclic AMP and calcium may act as second messengers. The sweetener and receptor(s) involves several molecular interactions (e.g., van der Waals, electrostatic, hydrogen bonds, hydrophobic, and others) and

physical-chemical complementarity among the receptor(s) and the sweetener. The protein structure file (receptor(s)) may be retrieved from the Protein Data Bank and has been described using x-ray diffraction. The details are as follows:
T1R2/T1R3: PDB: 5X2P, https://www.rcsb.org/structure/5X2P, DOI: 10.2210/pdb5X2P/pdb
Active site pockets of a protein molecule are the sites where the sweeteners bind to a protein. The skilled person will understand how to determine whether a compound binds to the active site pockets of T1R2 and/or T1R3. These experiments may, for example, involve the use of a HEK-based (Human embryonic kidney 293 cells) calcium fluorescence imaging assay as described and employed in Winnig et al., BMC Structural Biology 2007, 7:66 with reference to neohesperidin dihydrochalcone.

[0292] There is also provided a consumable comprising (a) 4-propylphenol, 3-ethylphenol, 2,6-dimethoxyphenol, or 3-methylbutanal, and (b) at least two further compounds selected from indole, 4-ethyl-2-methoxyphenol, 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, beta-damascone, geraniol, and dimethyl trisulfide, wherein the consumable does not include a sweetener. The term "sweetener" is defined above.

[0293] In some embodiments (a) is 4-propylphenol or 3-ethylphenol, and (b) includes at least two compounds selected from indole, 4-ethyl-2-methoxyphenol, 2-furfurylthiol, 2-ethyl-3,5-dimethylpyrazine, furaneol, sotolone, and 2,4-dimethylpyridine. When (a) is 4-propylphenol, (b) may include at least two compounds selected from indole, 4-ethyl-2-methoxyphenol, 2-furfurylthiol, 2-ethyl-3,5-dimethylpyrazine, sotolone, and 2,4-dimethylpyridine, optionally where (b) further comprises (i) 2-furfurylthio, (ii) sotolone, or (iii) 2,4-dimethylpyridine and 2-ethyl-3,5-dimethylpyrazine. When (a) is 3-ethylphenol, (b) may include at least two compounds selected from 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, and beta-damascone.

[0294] In some embodiments, (a) is 3-ethylphenol, and (b) comprises sotolone and at least one further compound selected from 2-furfurylthiol, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, and furaneol, optionally wherein (b) comprises: (i) furaneol, 3-ethyl-3,5-dimethylpyrazine, and Sotolone; (ii) 2-furfurylthiol, 2,4-dimethylpyridine, sotolone, and dimethyl trisulphide.

[0295] In some embodiments, (a) is 3-ethylphenol and (b) comprises at least two compounds selected from 2-furfurylthiol, 2,4-dimethylpyridine, and beta-damascone.

[0296] In some embodiments, (a) is 2,6-dimethoxyphenol, and (b) comprises at least two compounds selected from 2-ethyl-3,5-dimethylpyrazine, dimethyl trisulphide, and geraniol. In some embodiments, (a) is 2,6-dimethoxyphenol, and (b) comprises 2-ethyl-3,5-dimethylpyrazine, and geraniol, optionally wherein (b) further comprises diethyl trisulphide.

[0297] In some embodiments (a) is 3-methylbutanal, and (b) comprises at least two compounds selected from 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, 2-furfurylthiol, and furaneol. In some embodiments (a) is 3-methylbutanal, and (b) comprises furaneol and 2-ethyl-3,5-dimethylpyrazine, optionally further comprising 2,4-dimethylpyridine, 2-furfurylthiol, or a combination thereof.

[0298] In any of the above embodiments, the total amount of the compounds (a) and (b) may be about 0.01 wt% to about 10 wt%, based on the total weight of the consumable. In some embodiments the total amount of the compounds (a) and (b) may be about 0.01 wt% to about 5 wt%, based on the total weight of the consumable.

[0299] In any of the above embodiments, the consumable may comprise an aerosol former material as defined herein.

[0300] The present disclosure further provides a consumable for an aerosolisable formulation, wherein the consumable is a flavour block and comprises (a) at least 40 wt% of an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof; and (b) 60 wt% or less of at least two further compounds selected from substituted pyrroles, substituted furans, substituted furanones, substituted pyridines, substituted pyrazines, rose ketones, acyclic monoterpenoids, and trisulfides. The aliphatic and/or alkoxy phenol, aliphatic aldehyde, substituted pyrrole, substituted furan, substituted furanones, substituted pyridine, substituted pyrazine, rose ketone, acyclic monoterpenoid, and trisulfide are as defined hereinabove. Specific combinations are also set out below.

[0301] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para- position;

(iii) an aromatic substituted pyrrole, optionally wherein the aromatic group is a C_6-C_{12} aromatic group;

(iv) a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic

thiol; and

(v) a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, C_{1-10} alkyl groups, C_{1-10} alkenyl groups, hydroxyl groups and C_{1-10} alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0302] In some embodiments the consumable comprises:

(i) 75 wt% to about 99 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.1 to about 30 wt% of an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para-position;

(iii) 0.1 to about 5 wt% of an aromatic substituted pyrrole, optionally wherein the aromatic group is a C_6-C_{12} aromatic group; and

(iv) 0.0001 wt% to about 0.1 wt% of a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; or

(v) 0.01 wt% to about 10 wt% of a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, C_{1-10} alkyl groups, C_{1-10} alkenyl groups, hydroxyl groups and C_{1-10} alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0303] In some embodiments the consumable comprises 4-propylphenol, 4-ethyl-2-methoxyphenol, and indole, and 2-furfurylthiol or sotolone. In some embodiments the consumable comprises 75 wt% to about 99 wt% 4-propylphenol, 0.1 to about 30 wt% 4-ethyl-2-methoxyphenol, and 0.1 to about 5 wt% indole, and 0.0001 wt% to about 0.1 wt% 2-furfurylthiol or 0.01 wt% to about 10 wt% sotolone.

[0304] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para- position;

(iii) an aromatic substituted pyrrole, optionally wherein the aromatic group is a C_6-C_{12} aromatic group; and

(iv) an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups; and

(v) an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups.

[0305] In some embodiments the consumable comprises:

(i) 75 wt% to about 99 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.1 to about 30 wt% of an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para-position;

(iii) 0.1 to about 5 wt% of an aromatic substituted pyrrole, optionally wherein the aromatic group is a C_6-C_{12} aromatic group; and

(iv) 0.01 wt% to about 40 wt% of an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups; and

(v) 0.01 wt% to about 15 wt% of an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups.

[0306] In some embodiments the consumable comprises 4-propylphenol, 4-ethyl-2-methoxyphenol, indole, 2,4-dimethylpyridine, and 2-ethyl-3,5-dimethylpyrazine. In some embodiments the consumable comprises 75 wt% to about 99 wt% 4-propylphenol, 0.1 to about 30 wt% 4-ethyl-2-methoxyphenol, 0.1 to about 5 wt% indole, 0.01 wt% to about 40 wt% 2,4-dimethylpyridine, and 0.01 wt% to about 15 wt% 2-ethyl-3,5-dimethylpyrazine.

[0307] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) a substituted furanone represented by a compound of formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group; and

(iv) a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0308] In some embodiments the consumable comprises:

(i) 60 wt% to 99 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.01 wt% to about 15 wt% of an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 15 to about 35 wt% of a substituted furanone represented by a compound of formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group; and

(iv) 0.01 wt% to about 10 wt% of a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0309] In some embodiments the consumable comprises 3-ethylphenol, 2-ethyl-3,5-dimethylpyrazine, sotolone and furaneol. In some embodiments the consumable comprises 60 wt% to 99 wt% 3-ethylphenol, 0.01 wt% to about 15 wt% 2-ethyl-3,5-dimethylpyrazine, 0.01 wt% to about 10 wt% sotolone and 15 to about 35 wt% furaneol.

[0310] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; and

(iv) a rose ketone which is an α,β-ketone with a trimethylcyclohexene substituent at the α- position from the ketone group.

[0311] In some embodiments the consumable comprises:

(i) 75 wt% to about 99 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.01 wt% to about 40 wt% of an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 0.0001 wt% to about 0.1 wt% of a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; and

(iv) 0.1 to about 10 wt% of a rose ketone which is an α,β-ketone with a trimethylcyclohexene substituent at the α-position from the ketone group

[0312] In some embodiments the consumable comprises 2-furfurylthiol, 2,4-dimethylpyridine, 3-ethylphenol, and β-damascone. In some embodiments the consumable comprises 0.0001 wt% to about 0.1 wt% 2-furfurylthiol, 0.01 wt% to about 40 wt% 2,4-dimethylpyridine, 75 wt% to about 99 wt% 3-ethylphenol, and 0.1 to about 10 wt% β-damascone.

[0313] In some embodiments the consumable comprises:

(i) an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para- position;

(ii) an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) an oxygen-containing acyclic monoterpenoid, optionally wherein the oxygen-containing group is a hydroxyl- or alkoxy- group; and

(iv) an aliphatic trisulfide, such as an alkyl trisulfide.

[0314] In some embodiments the consumable comprises:

(i) 75 wt% to about 99 wt% of an alkoxyphenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl, alkenyl or an alkoxy group, the alkyl, alkenyl and alkoxy group being selected from C_1-C_{10} alkyls, C_1-C_{10} alkenyls and C_1-C_{10} alkoxy groups, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is an alkoxy group, optionally wherein the compound of formula (I) has at least one alkoxy group at the ortho- or para-position;

(ii) 0.01 wt% to about 15 wt% of an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 0.1 wt% to about 5 wt% of an oxygen-containing acyclic monoterpenoid, optionally wherein the oxygen-containing

group is a hydroxyl- or alkoxy- group; and

(iv) 0.0001 to about 0.1 wt% of an aliphatic trisulfide, such as an alkyl trisulfide.

[0315] In some embodiments the consumable comprises 2-ethyl-3,5-dimethylpyrazine, 2,6-dimethoxyphenol, geraniol, and dimethyl trisulphide. In some embodiments the consumable comprises 0.01 wt% to about 15 wt% 2-ethyl-3,5-dimethylpyrazine, 75 wt% to about 99 wt% 2,6-dimethoxyphenol, 0.1 wt% to about 5 wt% geraniol, and 0.0001 to about 0.1 wt% dimethyl trisulphide.

[0316] In some embodiments the consumable comprises:

(i) an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol;

(iv) a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group; and

(v) an aliphatic trisulfide, such as an alkyl trisulfide.

[0317] In some embodiments the consumable comprises an aerosol former material, and:

(i) 60 wt% to about 99 wt% of an aliphatic phenol represented by a compound of formula (I), wherein R_1, R_2, R_3, R_4 and R_5 are each independently hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups being selected from C_1-C_{10} alkyls and C_1-C_{10} alkenyls, provided that at least one of R_1, R_2, R_3, R_4 and R_5 is not hydrogen, optionally wherein the compound of formula (I) has at least one non-hydrogen substituent at the meta- or para-position;

(ii) 0.01 wt% to about 40 wt% of an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 0.0001 wt% to about 0.1 wt% of a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol;

(iv) 0.01 wt% to about 10 wt% of a substituted furanone represented by a compound of formula (II), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, $C_{1\text{-}10}$ alkyl groups, $C_{1\text{-}10}$ alkenyl groups, hydroxyl groups and $C_{1\text{-}10}$ alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group; and

(v) 0.0001 wt% to about 0.1 wt% of an aliphatic trisulfide, such as an alkyl trisulfide.

[0318] In some embodiments the consumable comprises 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 3-ethylphenol, and dimethyl trisulphide. In some embodiments the consumable comprises 0.0001 wt% to about 0.1 wt% 2-furfurylthiol, 0.01 wt% to about 10 wt% sotolone, 0.01 wt% to about 40 wt% 2,4-dimethylpyridine, 60 wt% to about 99 wt% 3-ethylphenol, and 0.0001 wt% to about 0.1 wt% dimethyl trisulphide.

[0319] In some embodiments the consumable comprises:

(i) an aliphatic aldehyde, optionally wherein the aliphatic group is a $C_{1\text{-}10}$ alkyl group;

(ii) an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iv) a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic

thiol; and

(v) a substituted furanone represented by a compound of formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, C_{1-10} alkyl groups, C_{1-10} alkenyl groups, hydroxyl groups and C_{1-10} alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0320] In some embodiments the consumable comprises:

(i) 40 wt% to about 75 wt% of an aliphatic aldehyde, optionally wherein the aliphatic group is a C_{1-10} alkyl group;

(ii) 0.01 wt% to about 40 wt% of an aliphatic substituted pyridine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iii) 0.01 wt% to about 15 wt% of an aliphatic substituted pyrazine, optionally wherein the aliphatic groups are C_1-C_{10} alkyl groups;

(iv) 0.0001 wt% to about 0.1 wt% of a furan substituted with a sulphur-containing group, optionally wherein the sulphur-containing group is an aliphatic thiol; and

(v) 15 to about 35 wt% of a substituted furanone represented by a compound of formula (III), wherein R_1, R_2 and R_3 are each independently selected from hydrogen, C_{1-10} alkyl groups, C_{1-10} alkenyl groups, hydroxyl groups and C_{1-10} alkoxy groups, provided that at least one of R_1, R_2 and R_3 is a hydroxyl group.

[0321] In some embodiments the consumable comprises 2-furfurylthiol, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, and 3-methylbutanal. In some embodiments the consumable comprises 0.0001 wt% to about 0.1 wt% 2-furfurylthiol, 0.01 wt% to about 40 wt% 2,4-dimethylpyridine, 0.01 wt% to about 40 wt% 2-ethyl-3,5-dimethylpyrazine, 15 to about 35 wt% furaneol, and 40 wt% to about 75 wt% 3-methylbutanal.

[0322] The present invention will now be described with reference to the following non-limiting examples.

EXAMPLES

Experimental 1

[0323] An investigation was conducted to address the sensorial gap between the use of aerosol delivery devices (i.e. vape products) and smoking conventional cigarettes. The first stage of the investigation was to conduct a sensory analysis of each of the compounds defined in the appended claims, in combination with aerosol former material. This analysis involved the preparation of the aerosolisable formulations detailed in Table 1, a sensory analysis of the formulation before smoking the formulation using a non-combustible aerosol provision system, and a sensory analysis after smoking the formulation using a non-combustible aerosol provision system. The sensory analysis was conducted by a sensory panel of dualists. The aerosolisable formulations were prepared using a 50/50 mixture of propylene glycol (PG) and glycerol (VG).

Table 1

Compound	CAS No.	Concentr ation in PG/VG (50/50) [wt%]	Sensory impression before smoking	Sensory impression after smoking
geraniol	106-24-1	0.5	Rose, lemon	Floral smoke, pleasant, green, rubbery
indole	120-72-9	0.5	Faecal, rotten	Skunk, rotten jasmine flowers
β-damascone	23726-91-2	0.5	Apple, tobacco	Apple mild on tongue, pleasant smoke
2-ethyl-3,5-dimethyl-pyrazine	27043-05-6	1	Musty	Musty, dusty, smoky, brown
4-ethyl-2-methoxyphenol	2785-89-9	0.5	Guaiacol	Smokey, guaiacol like

(continued)

Compound	CAS No.	Concentr ation in PG/VG (50/50) [wt%]	Sensory impression before smoking	Sensory impression after smoking
sotolone	28664-35-9	0.5	Fenugreek, savoury	Fenugreek, dry green, dry hay
furaneol	3658-77-3	5	Sugar, strawberry	Heiße maroni
dimethyl trisulphide	3658-80-8	0.1	Sulphur	Savoury, onion, sulphur
3-methylbutanal	590-86-3	0.5	malty	Bitter taste, cocoa
3-ethylphenol	620-17-7	0.01	Jute sac, phenolic	Dusty, rubber balloon, mouthfeel
4-propylphenol	645-56-7	0.5	Phenolic, dusty	Sweet, metallic taste, quaiacol like, nelke
2,6-dimethoxyphenol	91-10-1	0.5	Phenolic	Phenolic, smoky, BBQ, burnt guaiacol
2-furfurylthiol	98-02-2	0.0001	Savoury	Savoury, sulphur mild, roasted food
2,4-Dimethylpyridine	108-47-4	1	Smokey, faecal	Smokey, faecal, tar, strong body.

[0324] From the above sensory analysis, it is notable that the sensory impression after smoking differs from that before smoking. On the basis of the sensory analysis after smoking, the formulations as defined in the appended claims, i.e. containing at least three of the above compounds, were prepared and analysed for their sensorial properties in an aerosolisable formulation. Such formulations were found to provide a smoky, leathery and/or savoury aroma which was described as "tobacco-like" and beneficial for replicating an FMC-like experience in a non-combustible aerosol provision system.

Experimental 2

[0325] Following Experimental 1, four exemplary aerosolisable formulations according to the present disclosure were prepared and compared against a baseline aerosolisable formulation for their ability to replicate smoking a combustible tobacco product. The baseline aerosolisable formulation (Tobacco Flavour e-liquid) was selected due to its popularity with smokers in the UK market; it is commercially available from Nicoventures Retail (UK) Limited.

[0326] The sensorial focus areas were: impact, irritation, tobacco taste intensity, and mouthfeel. These areas represent consumer-specified differences between aerosol delivery devices and conventional cigarettes.

[0327] Consumables comprising compounds as described in Table 1 were prepared. In particular, stock solutions of individual compounds were obtained and aliquots of each stock solution were combined and brought up to a defined volume to achieve the target concentrations. The consumables as prepared are detailed in Table 2. These consumables were then formulated into aerosolisable formulations. The consumables were included at 10 wt% in the aerosolisable formulation along with at least 80 wt% of a PG/VG carrier and nicotine.

[0328] The sensory analysis was conducted by a trained sensory panel of 8 cigarette users and/or dualists. The panel were chosen for their expertise and knowledge in both design and sensory performance of conventional cigarettes. Samples were prepared according to the details in Table 2 and the panellists compared the sensory experience of each formulation against Tobacco Flavour e-liquid in an aerosol delivery device. The wt% values are relative to the total weight of the consumable.

[0329] The same aerosol provision device was used for all formulations. This was a non-combustible aerosol provision device. The same instructions were provided to all participants. The only difference between each test was the formulation being used in the non-combustible aerosol provision device. All of the formulations included 18 mg/ml nicotine.

Table 2

Formulation No.	Components of the Consumable	Consumable Concentrations (wt%), based on the total weight of the consumable
1	Tobacco Flavour e-liquid	-
2	2-furfurylthiol 4-propylphenol 4-ethyl-3-methoxyphenol Indole PG/VG mixture	(a) 0.2 wt% of the combination of 4-propylphenol and 4-ethyl-2-methoxyphenol (b) 0.004 wt% of the combination of 2-furfurylthiol and indole Balance PG/VG mixture
3	4-propylphenol 4-ethyl-2-methoxyphenol Sotolone Indole	(a) 0.2 wt% of the combination of 4-propylphenol and 4-ethyl-2-methoxyphenol (b) 0.003 wt% of the combination of sotolone and indole Balance PG/VG mixture
4	2-ethyl-3,5-dimethylpyrazine 3-ethylphenol Sotolone Furaneol	(a) 0.1 wt% 3-ethylphenol (b) 0.04 wt% of the combination of 2-ethyl-3,5-dimethylpyrazine, sotolone and furaneol Balance PG/VG mixture
5	2-ethyl-3,5-dimethylpyridine Dimethyl trisulfide 2,6-dimethoxyphenol geraniol	(a) 0.1 wt% 2,6-dimethoxyphenol (b) 0.01 wt% of the combination of 2-ethyl-3,5-dimethylpyridine, dimethyl trisulfide, and geraniol Balance PG/VG mixture

[0330] The sensory analysis was conducted using a sequential monadic scale (1-10). The results are shown in Figure 2.

[0331] Figure 2 shows the immediate results, namely after 2 puffs, for impact, irritation, mouthful of aerosol/mouthfeel and tobacco taste intensity. It can be see that Formulations 2, 3, 4 and 5 provide comparable levels of impact, irritation, and mouthfeel when compared to tobacco flavour e-liquid (Formulation 1). There is also a comparable tobacco taste intensity for Formulations 2 and 5. This is a significant result because of the need to balance impact, irritation, mouthfeel and taste when delivering an e-liquid to replicate smoking a combustible tobacco product. Formulations 3 and 4 are also able to deliver directionally higher tobacco taste intensity compared to the FMC-like benchmark formulation (Formulation 1). The same results were observed at the end of the sensory analysis, i.e. reflective of the overall experience by the panellists.

[0332] In addition to the above analysis, the panelists were asked to comment on how the formulations compared to an FMC like (i.e. factory made cigarette like) experience. The comments are presented in Table 3 below.

Table 3

Formulation	Comparable to FMC experience?
1	• Impact • Irritation
2	• Smokiness
3	• Smokiness
4	• Smokiness • Impact
5	• Smokiness

[0333] As demonstrated by the above results, each of Formulations 2, 3, 4 and 5 provide a modified sensory experience when compared with a Tobacco Flavour e-liquid (Formulation 1). In particular, they are able to improve the "Smokiness" of the formulation so as to more closely replicate the in-smoking experience in terms of flavor and specifically aroma. Formulation 4 is also able to provide an impact comparable to an FMC experience.

Experimental 3

[0334] Further prototype consumables were prepared as aerosolisable formulations and testing with a sensory analysis. These formulations were described by panellists as providing a "tobacco-like" aroma. The formulation details are set out in Table 4. The consumable was included in the aerosolisable formulation at 10 wt% along with at least 80 wt% of a PG/VG carrier and nicotine.

Table 4

Consumable Components	Consumable Concentrations (wt%), based on the total weight of the consumable
4-propylphenol 4-ethyl-3-methoxyphenol 2,4-dimethylpyridine Indole PG/VG mixture	(a) 0.3 wt% of the combination of 4-propylphenol and 4-ethyl-2-methoxyphenol (b) 0.004 wt% of the combination of 2,4-dimethylpyridine and indole Balance PG/VG mixture
3-ethylphenol 2,4-dimethylpyridine 2-furfurylthiol Beta-damascone	(a) 0.1 wt% 3-ethylphenol (b) 0.02 wt% of the combination of 2,4-dimethylpyridiine, 2-furfurylthiol, and beta-damascone Balance PG/VG mixture
3-ethylphenol 2,4-dimethylpyridine sotolone 2-furfurylthiol Dimethyl trisulfide	(a) 0.05 wt% 3-ethylphenol (b) 0.02 wt% of the combination of 2,4-dimethylpyridiine, sotolone, 2-furfurylthiol, and dimethyl trisulfide Balance PG/VG mixture
3-methylbutanal 2,4-dimethylpyridine 2-ethyl-3,5-dimethylpyrazine 2-furfurylthiol Furaneol	(a) 0.02 wt% 3-methylbutanal (b) 0.02 wt% of the combination of 2,4-dimethylpyridiine, 2-ethyl-3,5-dimethylpyrazine, 2-furfurylthiol, and furaneol Balance PG/VG mixture

[0335] The invention will be described in further detail in the following numbered embodiments.

1. A consumable for an aerosolisable formulation, wherein the consumable comprises:

   (a) less than about 1 wt% of an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof; and

   (b) at least two further compounds selected from substituted pyrroles, substituted furans, substituted furanones, substituted pyridines, substituted pyrazines, rose ketones, acyclic monoterpenoids, and trisulfides, wherein the total amount of the at least two further compounds is less than about 5 wt%.

2. The consumable according to embodiment 1, wherein the consumable comprises (a) aliphatic phenol and alkoxy phenol.

3. The consumable according to embodiment 1, wherein the consumable comprises (a) aliphatic phenol(s).

4. The consumable according to embodiment 1, wherein the consumable comprises (a) alkoxy phenol(s).

5. The consumable according to any preceding embodiment, wherein the consumable comprises (a) aliphatic aldehyde(s).

6. The consumable according to any preceding embodiment, wherein the aliphatic and/or alkoxy phenol is selected from alkyl phenols and alkoxyphenols.

7. The consumable according to any preceding embodiment, wherein the aliphatic and/or alkoxy phenol is selected from propylphenol, ethylphenol, dimethoxyphenol, and ethylmethoxyphenol.

8. The consumable according to any preceding embodiment, wherein the aliphatic and/or alkoxy phenol is selected from 4-propylphenol, 3-ethylphenol, 2,6-dimethoxyphenol, and 4-ethyl-2-methoxyphenol.

9. The consumable according to any preceding embodiment, wherein the aliphatic and/or alkoxy phenols are selected from 4-propylphenol, 3-ethylphenol, 4-ethyl-2-methoxyphenol, or a combination thereof.

10. The consumable according to any preceding embodiment, wherein the aliphatic and/or alkoxy phenols are a combination of 4-propylphenol and 4-ethyl-2-methoxyphenol.

11. The consumable according to any preceding embodiment, wherein the aliphatic and/or alkoxy phenols are 3-ethylphenol.

12. The consumable according to any preceding embodiment, wherein the alkoxy phenol is 2,6-dimethoxyphenol.

13. The consumable according to any preceding embodiment, wherein the aliphatic aldehyde is an alkyl aldehyde.

14. The consumable according to any preceding embodiment, wherein the aliphatic aldehyde is methylbutanal.

15. The consumable according to any preceding embodiment, wherein the aliphatic aldehyde is 3-methylbutanal.

16. The consumable according to any preceding embodiment, wherein the at least two further compounds are selected from aromatic substituted pyrroles, thiol substituted furans, substituted furanones, aliphatic substituted pyridines, aliphatic substituted pyrazines, rose ketones, hydroxyl-containing acyclic monoterpenoids, and alkyl trisulfides.

17. The consumable according to any preceding embodiment, wherein the at least two further compounds are selected from indole, 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, beta-damascone, geraniol, and dimethyl trisulphide.

18. The consumable according to any preceding embodiment, wherein the at least two further compounds are selected from indole, 2-furfurylthiol, 2-ethyl-3,5-dimethylpyrazine, furaneol, sotolone, and 2,4-dimethylpyridine.

19. The consumable according to any preceding embodiment, wherein the at least two further compounds are selected from indole, 2-furfurfylthiol, sotolone, 2,-dimethylpyridine, and 2-ethyl-3,5-dimethylpyrazine.

20. The consumable according to any preceding embodiment, wherein the at least two further compounds are indole and 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, or 2-ethyl,3-5-dimethylpyrazine.

21. The consumable according to any preceding embodiment, wherein the at least two further compounds are indole and 2-furfurylthiol.

22. The consumable according to any preceding embodiment, wherein the at least two further compounds are indole and sotolone.

23. The consumable according to any preceding embodiment, wherein the at least two further compounds are a combination of indole, 2,4-dimethylpyridine and 2-ethyl,3-5-dimethylpyrazine.

24. The consumable according to any preceding embodiment, wherein the at least two further compounds are selected from 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, beta-damascone, dimethyl trisulphide or a combination thereof.

25. The consumable according to any preceding embodiment, wherein the at least two further compounds include sotolone, and a compound selected from 2-furfurylthiol, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, dimethyl trisulphide or a combination thereof.

26. The consumable according to any preceding embodiment, wherein the at least two further compounds comprise:

(i) furaneol, 2-ethyl-3,5-dimethylpyrazine, and sotolone; or

(ii) 2-furfurylthiol, 2,4-dimethylpyridine, sotolone, and dimethyl trisulphide.

27. The consumable according to any preceding embodiment, wherein the at least two further compounds are a combination of 2-ethyl-3,5-dimethylpyrazine, sotolone and furaneol.

28. The consumable according to any preceding embodiment, wherein the at least two further compounds are a combination of 2,4-dimethylpyridine, 2-furfurylthiol, and beta-damascone.

29. The consumable according to any preceding embodiment, wherein the at least two further compounds are selected from 2,4-dimethylpyridine, 2-furfurylthiol and sotolone.

30. The consumable according to any preceding embodiment, wherein the consumable comprises alkoxy phenol and the at least two further compounds are selected from 2-ethyl-3,5-dimethylpyrazine, dimethyl trisulphide, and geraniol.

31. The consumable according to any preceding embodiment, wherein the at least two further compounds are 2-ethyl-3,5-dimethylpyrazine and geraniol.

32. The consumable according to any preceding embodiment, wherein the consumable comprises the aliphatic aldehyde and the at least two further compounds are selected from 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, 2-furfurylthiol, and furaneol.

33. The consumable according to any preceding embodiment, wherein the at least two further compounds are furaneol and 2-ethyl-3,5-dimethylpyrazine, optionally further comprise 2,4-dimethylpyridine, 2-furfurylthiol, or a combination thereof.

34. The consumable according to any preceding embodiment, wherein the consumable further comprises 2,4-dimethylpyridine, 2-furfurylthiol, or a combination thereof.

35. The consumable according to any preceding embodiment, wherein the consumable further comprises dimethyl trisulphide.

36. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.000001 wt% to about 10 wt%, based on the total weight of the consumable.

37. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.000001 wt% to about 9 wt%, based on the total weight of the consumable.

38. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.000001 wt% to about 8 wt%, based on the total weight of the consumable.

39. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.000001 wt% to about 7 wt%, based on the total weight of the consumable.

40. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.000001 wt% to about 6 wt%, based on the total weight of the consumable.

41. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.000001 wt% to about 5 wt%, based on the total weight of the consumable.

42. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.00001 wt% to about 5 wt%, based on the total weight of the consumable.

43. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.0001 wt% to about 4 wt%, based on the total weight of the consumable.

44. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.0001 wt% to about 3 wt%, based on the total weight of the consumable.

45. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.0001 wt% to about 2 wt%, based on the total weight of the consumable.

46. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.0001 wt% to about 2 wt%, based on the total weight of the consumable.

47. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.001 wt% to about 2 wt%, based on the total weight of the consumable.

48. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.01 wt% to about 2 wt%, based on the total weight of the consumable.

49. The consumable according to any preceding embodiment, wherein the total amount of (a) and (b) is about 0.01 wt% to about 1 wt%, based on the total weight of the consumable.

50. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.75 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

51. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.5 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

52. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.25 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

53. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.001 wt% to about 1 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

54. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.005 wt% to about 1 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

55. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 1 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

56. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.75 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

57. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.5 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

58. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.25 wt% of the aliphatic and/or alkoxy phenol, aliphatic aldehyde, or combination thereof.

59. The consumable according to any preceding embodiment, wherein the total amount of the at least two further compounds is about 0.000001 wt% to about 5 wt%, based on the total weight of the consumable.

60. The consumable according to any preceding embodiment, wherein the total amount of the at least two further compounds is about 0.00001 wt% to about 5 wt%, based on the total weight of the consumable.

61. The consumable according to any preceding embodiment, wherein the total amount of the at least two further compounds is about 0.0001 wt% to about 5 wt%, based on the total weight of the consumable.

62. The consumable according to any preceding embodiment, wherein the total amount of the at least two further compounds is about 0.0001 wt% to about 4 wt%, based on the total weight of the consumable.

63. The consumable according to any preceding embodiment, wherein the total amount of the at least two further compounds is about 0.0001 wt% to about 3 wt%, based on the total weight of the consumable.

64. The consumable according to any preceding embodiment, wherein the total amount of the at least two further compounds is about 0.0001 wt% to about 2 wt%, based on the total weight of the consumable.

65. The consumable according to any preceding embodiment, wherein the total amount of the at least two further

compounds is about 0.0001 wt% to about 1 wt%, based on the total weight of the consumable.

66. The consumable according to any preceding embodiment, wherein the total amount of the at least two further compounds is about 0.001 wt% to about 1 wt%, based on the total weight of the consumable.

67. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.75 wt% of the aliphatic and alkoxy phenol.

68. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.5 wt% of the aliphatic and alkoxy phenol.

69. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.25 wt% of the aliphatic and alkoxy phenol.

70. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.001 wt% to about 1 wt% of the aliphatic and alkoxy phenol.

71. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.005 wt% to about 1 wt% of the aliphatic and alkoxy phenol.

72. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 1 wt% of the aliphatic and alkoxy phenol.

73. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.75 wt% of the aliphatic and alkoxy phenol.

74. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.5 wt% of the aliphatic and alkoxy phenol.

75. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.25 wt% of the aliphatic and alkoxy phenol.

76. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.75 wt% of the aliphatic phenol.

77. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.5 wt% of the aliphatic phenol.

78. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.25 wt% of the aliphatic phenol.

79. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.001 wt% to about 1 wt% of the aliphatic phenol.

80. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.005 wt% to about 1 wt% of the aliphatic phenol.

81. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 1 wt% of the aliphatic phenol.

82. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.75 wt% of the aliphatic phenol.

83. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.5 wt% of the aliphatic phenol.

84. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.25 wt% of the aliphatic phenol.

85. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.75 wt% of the alkoxy phenol.

86. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.5 wt% of the alkoxy phenol.

87. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.25 wt% of the alkoxy phenol.

88. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.001 wt% to about 1 wt% of the alkoxy phenol.

89. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.005 wt% to about 1 wt% of the alkoxy phenol.

90. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 1 wt% of the alkoxy phenol.

91. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.75 wt% of the alkoxy phenol.

92. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.5 wt% of the alkoxy phenol.

93. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.25 wt% of the alkoxy phenol.

94. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.75 wt% of the aliphatic aldehyde.

95. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.5 wt% of the aliphatic aldehyde.

96. The consumable according to any preceding embodiment, wherein the consumable comprises less than about 0.25 wt% of the aliphatic aldehyde.

97. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.001 wt% to about 1 wt% of the aliphatic aldehyde.

98. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.005 wt% to about 1 wt% of the aliphatic aldehyde.

99. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 1 wt% of the aliphatic aldehyde.

100. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.75 wt% of the aliphatic aldehyde.

101. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.5 wt% of the aliphatic aldehyde.

102. The consumable according to any preceding embodiment, wherein the consumable comprises about 0.01 wt% to about 0.25 wt% of the aliphatic aldehyde.

103. The consumable according to any preceding embodiment, wherein 2,4-dimethylpyridine is present in an amount of less than 0.1 wt% on the basis of the total mass of the consumable.

104. The consumable according to any preceding embodiment, wherein 2-ethyl-3,5-dimethylpyrazine is present in an

amount of less than 0.01 wt% on the basis of the total mass of the consumable.

105. The consumable according to any preceding embodiment, wherein 2-furfurylthiol is present in an amount of less than 0.0001 wt% on the basis of the total mass of the consumable.

106. The consumable according to any preceding embodiment, wherein 4-propylphenol is present in an amount of less than 1.0 wt% on the basis of the total mass of the consumable.

107. The consumable according to any preceding embodiment, wherein 3-ethylphenol is present in an amount of less than 1.0 wt% on the basis of the total mass of the consumable.

108. The consumable according to any preceding embodiment, wherein 4-ethyl-2-methoxyphenol is present in an amount of less than 1.0 wt% on the basis of the total mass of the consumable.

109. The consumable according to any preceding embodiment, wherein sotolone is present in an amount of less than 0.1 wt% on the basis of the total mass of the consumable.

110. The consumable according to any preceding embodiment, wherein indole is present in an amount of less than 0.1 wt% on the basis of the total mass of the consumable.

111. The consumable according to any preceding embodiment, wherein furaneol is present in an amount of less than 0.1 wt% on the basis of the total mass of the consumable.

112. The consumable according to any preceding embodiment, wherein dimethyl trisulphide is present in an amount of less than 0.0001 wt% on the basis of the total mass of the consumable.

113. The consumable according to any preceding embodiment, wherein 2,6-dimethoxyphenol is present in an amount of less than 1.0 wt% on the basis of the total mass of the consumable.

114. The consumable according to any preceding embodiment, wherein 3-methylbutanal is present in an amount of less than 1.0 wt% on the basis of the total mass of the consumable.

115. The consumable according to any preceding embodiment, wherein beta-damascone is present in an amount of less than 0.1 wt% on the basis of the total mass of the consumable.

116. The consumable according to any preceding embodiment, wherein geraniol is present in an amount of less than 0.1 wt% on the basis of the total mass of the consumable.

117. The consumable according to any preceding embodiment, wherein 2,4-dimethylpyridine is present in an amount of 0.0001 to 0.1 wt% on the basis of the total mass of the consumable.

118. The consumable according to any preceding embodiment, wherein 2-ethyl-3,5-dimethylpyrazine is present in an amount of 0.00001 to 0.01 wt% on the basis of the total mass of the consumable.

119. The consumable according to any preceding embodiment, wherein 2-furfurylthiol is present in an amount of 0.0000001 to 0.0001 wt% on the basis of the total mass of the consumable.

120. The consumable according to any preceding embodiment, wherein 4-propylphenol is present in an amount of 0.01 to 1.0 wt% on the basis of the total mass of the consumable.

121. The consumable according to any preceding embodiment, wherein 3-ethylphenol is present in an amount of 0.001 to 1.0 wt% on the basis of the total mass of the consumable.

122. The consumable according to any preceding embodiment, wherein 4-ethyl-2-methoxyphenol is present in an amount of 0.0001 to 1.0 wt% on the basis of the total mass of the consumable.

123. The consumable according to any preceding embodiment, wherein sotolone is present in an amount of 0.0001 to 0.1 wt% on the basis of the total mass of the consumable.

124. The consumable according to any preceding embodiment, wherein indole is present in an amount of 0.0001 to 0.1 wt% on the basis of the total mass of the consumable.

125. The consumable according to any preceding embodiment, wherein furaneol is present in an amount of 0.0001 to 0.1 wt% on the basis of the total mass of the consumable.

126. The consumable according to any preceding embodiment, wherein dimethyl trisulphide is present in an amount of 0.0000001 to 0.0001 wt% on the basis of the total mass of the consumable.

127. The consumable according to any preceding embodiment, wherein 2,6-dimethoxyphenol is present in an amount of 0.0001 to 1.0 wt% on the basis of the total mass of the consumable.

128. The consumable according to any preceding embodiment, wherein 3-methylbutanal is present in an amount of 0.0001 to 1.0 wt% on the basis of the total mass of the consumable.

129. The consumable according to any preceding embodiment, wherein beta-damascone is present in an amount of 0.0001 to 0.1 wt% on the basis of the total mass of the consumable.

130. The consumable according to any preceding embodiment, wherein geraniol is present in an amount of 0.0001 to 0.1 wt% on the basis of the total mass of the consumable.

131. The consumable according to any preceding embodiment, wherein the consumable further comprises an aerosol former material.

132. The consumable according to embodiment

133. The consumable according to any preceding embodiment, wherein the consumable further comprises an aerosol former material. 130, wherein the aerosol former material comprise one or more of glycerol, propylene glycol, water, diethylene glycol, triethylene glycol, tetraethylene glycol, 1,3-butylene glycol, erythritol, meso-Erythritol, ethyl vanillate, ethyl laurate, a diethyl suberate, triethyl citrate, triacetin, a diacetin mixture, benzyl benzoate, benzyl phenyl acetate, tributyrin, lauryl acetate, lauric acid, myristic acid, propylene carbonate, ethanol and benzyl alcohol.

134. The consumable according to embodiment 130 or 131, wherein the aerosol former material comprises glycerol, propylene glycol and one or more of water, diethylene glycol, triethylene glycol, tetraethylene glycol, 1,3-butylene glycol, erythritol, meso-Erythritol, ethyl vanillate, ethyl laurate, a diethyl suberate, triethyl citrate, triacetin, a diacetin mixture, benzyl benzoate, benzyl phenyl acetate, tributyrin, lauryl acetate, lauric acid, myristic acid, propylene carbonate, ethanol and benzyl alcohol.

135. The consumable according to any one of embodiments 130 to 133, wherein the aerosol former material consists of glycerol, propylene glycol, ethanol, benzyl alcohol, water and combinations thereof.

136. The consumable according to any one of embodiments 130 to 134, wherein the aerosol former material consists of glycerol, propylene glycol, water and combinations thereof.

137. The consumable according to any one of embodiments 130 to 135, wherein the aerosol former material consists of ethanol, benzyl alcohol and combinations thereof.

138. The consumable according to any one of embodiments 130 to 136, wherein, based on the total amount of propylene glycol and glycerol in the aerosol former material, the aerosol former material comprises: 60 to 90 wt% propylene glycol; and 40 to 10 wt% glycerol.

139. The consumable according to any one of embodiments 130 to 137 , wherein, based on the total amount of propylene glycol and glycerol in the aerosol former material, the aerosol former material comprises: 70 to 80%w/w propylene glycol; and 30 to 20%w/w glycerol.

140. The consumable according to any preceding embodiment, wherein the consumable comprises aerosol former material in an amount of at least 70 wt% on the basis of the total mass of the consumable.

141. The consumable according to any preceding embodiment, wherein the consumable comprises aerosol former material in an amount of at least 80 wt% on the basis of the total mass of the consumable.

142. The consumable according to any preceding embodiment, wherein the consumable comprises aerosol former material in an amount of at least 90 wt% on the basis of the total mass of the consumable.

143. The consumable according to any preceding embodiment, wherein the consumable comprises aerosol former material in an amount of at least 95 wt% on the basis of the total mass of the consumable.

144. The consumable according to any preceding embodiment, wherein the consumable comprises aerosol former material in an amount of at least 99 wt% on the basis of the total mass of the consumable.

145. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine.

146. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of less than 10 wt% on the basis of the total mass of the consumable.

147. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of less than 5 wt% on the basis of the total mass of the consumable.

148. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of less than 4 wt% on the basis of the total mass of the consumable.

149. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of less than 3 wt% on the basis of the total mass of the consumable.

150. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of less than 2 wt% on the basis of the total mass of the consumable.

151. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of less than 1 wt% on the basis of the total mass of the consumable.

152. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of 0.01 to 10 wt% on the basis of the total mass of the consumable.

153. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of 0.01 to 5 wt% on the basis of the total mass of the consumable.

154. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of 0.01 to 4 wt% on the basis of the total mass of the consumable.

155. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of 0.01 to 3 wt% on the basis of the total mass of the consumable.

156. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of 0.01 to 2 wt% on the basis of the total mass of the consumable.

157. The consumable according to any preceding embodiment, wherein the consumable further comprises nicotine in an amount of 0.01 to 1 wt% on the basis of the total mass of the consumable.

158. The consumable according to any preceding embodiment, wherein the consumable further comprises an acid.

159. The consumable according to embodiment 157, wherein the acid is selected from acids having a pka of from 2 to 5.

160. The consumable according to embodiment 157 or 158, wherein the acid is selected from the group consisting of acetic acid, lactic acid, formic acid, citric acid, benzoic acid, pyruvic acid, levulinic acid, succinic acid, tartaric acid, sorbic acid, propionic acid, phenylacetic acid, and mixtures thereof.

161. The consumable according to embodiment 159, wherein the acid is selected from the group consisting of citric acid, benzoic acid, levulinic acid, lactic acid, sorbic acid, and mixtures thereof.

162. The consumable according to embodiment 159 or 160, wherein the acid is selected from the group consisting of citric acid, benzoic acid, levulinic acid, and mixtures thereof.

163. The consumable according to embodiments 157 to 161, wherein the molar ratio of acid to nicotine is from 5:1 to 1:5.

164. The consumable according to embodiments 157 to 162, wherein the molar ratio of acid to nicotine is from 4:1 to 1:4.

165. The consumable according to embodiments 157 to 163, wherein the molar ratio of acid to nicotine is from 3:1 to 1:3.

166. The consumable according to embodiments 157 to 164, wherein the molar ratio of acid to nicotine is from 2:1 to 1:2.

167. The consumable according to embodiments 157 to 165, wherein the molar ratio of acid to nicotine is from 1.5:1 to 1:1.5.

168. The consumable according to embodiments 157 to 166, wherein the molar ratio of acid to nicotine is from 1.2:1 to 1:1.2.

169. The consumable according to any preceding embodiment, wherein the consumable comprises nicotine in protonated form.

170. The consumable according to any preceding embodiment, wherein the consumable comprises nicotine in unprotonated form.

171. The consumable according to any preceding embodiment, wherein the consumable comprises nicotine in protonated form and unprotonated form.

172. The consumable according to any preceding embodiment, wherein the consumable does not include nicotine.

173. An aerosolisable formulation for an aerosol provision system comprising the consumable according to any preceding embodiment, a carrier or a binder, and optionally nicotine.

174. The aerosolisable formulation according to embodiment 172, wherein the carrier is present at about 50 wt% or more, based on the total weight of the formulation.

175. The aerosolisable formulation according to embodiment 172 or 173, wherein the carrier comprises propylene glycol, glycerol, water, or a combination thereof.

176. The aerosolisable formulation according to embodiment 172, wherein the binder is present and the binder comprises one or more gelling agent(s).

177. The aerosolisable formulation according to embodiment 175, wherein the formulation comprises a botanical material.

178. The aerosolisable formulation according to any of embodiments 172 to 176, wherein the formulation is in the form of a liquid or a gel.

179. An article comprising the consumable as defined in any of embodiments 1 to 171 or the aerosolisable formulation of any one of embodiments 172 to 177.

180. The article according to embodiment 178, the article comprising a store for receiving the consumable as defined in any of embodiments 1 to 171 or the aerosolisable formulation of any one of embodiments 172 to 177.

181. The article according to embodiment 178, the article further comprising, an aerosol generating component, an aerosol generating area, a transport element.

182. The article according to embodiment 178 or embodiment 179, wherein the article further comprises a mouthpiece,

183. The article according to embodiment 178 or embodiment 179, wherein the aerosol generating component comprises a heater and/or wherein the transport element is a wick.

184. An aerosol provision system comprising an aerosol provision device and an article according to any one of embodiments 178 to 182.

185. The aerosol provision system of embodiment 183, wherein the aerosol provision device is non-combustible.

186. A process for forming an aerosol, the process comprising providing the aerosolisable formulation as defined in any one of embodiments 172 to 177, or the aerosol provision system as defined in embodiment 183 or embodiment 184, and aerosolising the formulation in the system.

187. Use of a consumable as defined in any of embodiments 1 to 171, to modify at least one sensory property of an aerosolisable formulation.

188. The use of embodiment 186, wherein the sensory property is aroma and the aroma is modified relative to the aerosolisable formulation without the consumable.

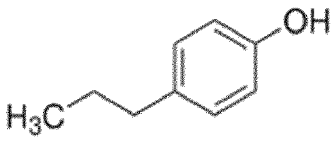
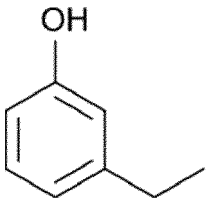
189. The use of embodiment 187, wherein the modification in aroma provides an aerosolisable formulation which replicates smoking a combustible tobacco product.

190. Use of a consumable as defined in any of embodiments 1 to 171, to modify the tobacco flavour intensity of an aerosolisable formulation.

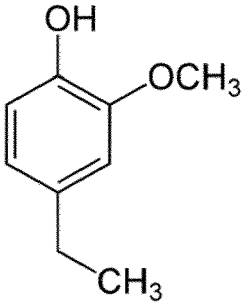
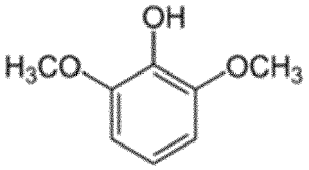
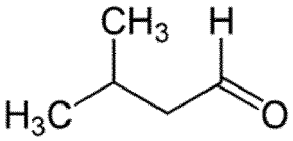
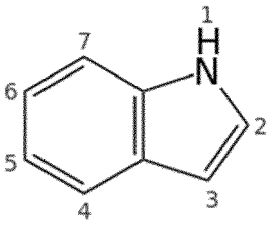
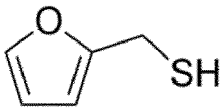
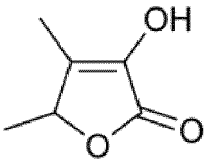
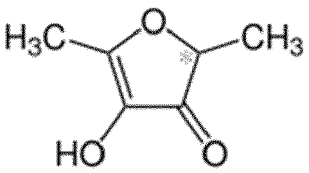
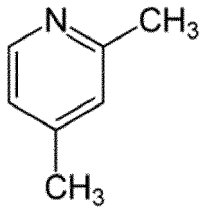
[0336] The various embodiments described herein are presented only to assist in understanding and teaching the claimed features. These embodiments are provided as a representative sample of embodiments only, and are not exhaustive and/or exclusive. It is to be understood that advantages, embodiments, examples, functions, features, structures, and/or other aspects described herein are not to be considered limitations on the scope of the invention as defined by the claims or limitations on equivalents to the claims, and that other embodiments may be utilised and modifications may be made without departing from the scope of the claimed invention. Various embodiments of the invention may suitably comprise, consist of, or consist essentially of, appropriate combinations of the disclosed elements, components, features, parts, steps, means, etc., other than those specifically described herein. In addition, this disclosure may include other inventions not presently claimed, but which may be claimed in future.

Annex 1

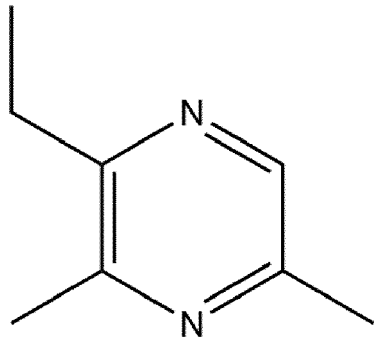
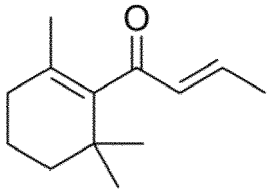
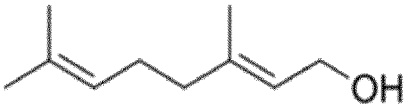
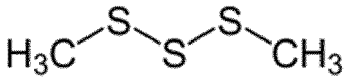
[0337]

Chemical Name	CAS No.	Chemical Structure
4-propylphenol	645-56-7	
3-ethylphenol	620-17-7	

(continued)

Chemical Name	CAS No.	Chemical Structure
4-ethyl-2-methoxyphenol	2785-89-9	
2,6-dimethoxyphenol	91-10-1	
3-methylbutanal	590-86-3	
Indole	120-72-9	
2-furfurylthiol	98-02-2	
Sotolone	28664-35-9	
Furaneol	3658-77-3	
2,4-dimethylpyridine	108-47-4	

(continued)

Chemical Name	CAS No.	Chemical Structure
2,ethyl-3,5-dimethylpyrazine	27043-05-06	
Beta-damascone	35044-68-9	
Geraniol	106-24-1	
Dimethyl trisulfide	3658-80-8	

Claims

1. A consumable for an aerosolisable formulation, wherein the consumable comprises:

   less than about 1 wt% of an aliphatic and/or alkoxy phenol, an aliphatic aldehyde, or a combination thereof; and at least two further compounds selected from substituted pyrroles, substituted furans, substituted furanones, substituted pyridines, substituted pyrazines, rose ketones, acyclic monoterpenoids, and trisulfides, wherein the total amount of the at least two further compounds is less than about 5 wt%.

2. The consumable according to claim 1, wherein the consumable further comprises an aerosol former material, optionally wherein the aerosol former material is present in an amount of at least about 70 wt%, based on the total weight of the consumable.

3. The consumable according to claim 1 or claim 2, wherein the total amount of the at least two further compounds is about 0.0001 wt% to about 5 wt%, based on the total weight of the consumable, optionally about 0.001 wt% to about 1 wt%, based on the total weight of the consumable.

4. The consumable according to any preceding claim, wherein the aliphatic and/or alkoxy phenol is selected from alkyl phenols, alkoxyphenols, and alkyl alkoxyphenols, such as 4-propylphenol, 3-ethylphenol, 2,6-dimethoxyphenol, and 4-ethyl-2-methoxyphenol, and optionally wherein the aliphatic aldehyde is an alkyl aldehyde, such as 3-methylbutanal.

5. The consumable according to any preceding claim, wherein the at least two further compounds are selected from aromatic substituted pyrroles, thiol substituted furans, hydroxyl-substituted furanones, aliphatic substituted pyridines, aliphatic substituted pyrazines, damascenes, damascenones, hydroxyl-containing acyclic monoterpenoids, and alkyl trisulfides, such as indole, 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol,

beta-damascone, geraniol, and dimethyl trisulphide.

6. The consumable according to claim 5, wherein the at least two further compounds are selected from indole, 2-furfurylthiol, 2-ethyl-3,5-dimethylpyrazine, furaneol, sotolone, and 2,4-dimethylpyridine, optionally wherein the consumable further comprises the aliphatic and/or alkoxy phenols, such as 4-propylphenol, 3-ethylphenol, 4-ethyl-2-methoxyphenol, or a combination thereof.

7. The consumable according to any preceding claim, wherein the consumable comprises the aliphatic phenol, such as 4-propylphenol, the aliphatic alkoxy phenol, such as 4-ethyl-2-methoxyphenol, and the at least two further compounds are selected from indole, 2-furfurfylthiol, sotolone, 2,-dimethylpyridine, and 2-ethyl-3,5-dimethylpyrazine, such as wherein the at least two further compounds are indole, and 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, or 2-ethyl,3-5-dimethylpyrazine.

8. The consumable according to any one of claims 1 to 5, wherein the consumable comprises the aliphatic phenol, such as 3-ethylphenol, and the at least two further compounds are selected from 2-furfurylthiol, sotolone, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, and beta-damascone, such as wherein the at least two further compounds include sotolone, and a compound selected from 2-furfurylthiol, 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, furaneol, or a combination thereof.

9. The consumable according to claim 8, wherein the at least two further compounds comprise:

(i) furaneol, 2-ethyl-3,5-dimethylpyrazine, and sotolone; or
(ii) 2-furfurylthiol, 2,4-dimethylpyridine, sotolone, and dimethyl trisulphide.

10. The consumable according to any one of claims 1 to 5, wherein the consumable comprises the aliphatic phenol, such as 3-ethylphenol, and the at least two further compounds are selected from 2-furfurylthiol, 2,4-dimethylpyridine, and beta-damascone;
or wherein the consumable comprises the alkoxy phenol, such as 2,6-dimethoxyphenol, and the at least two further compounds are selected from 2-ethyl-3,5-dimethylpyrazine, dimethyl trisulphide, and geraniol, such as wherein the at least two further compounds are 2-ethyl-3,5-dimethylpyrazine and geraniol, optionally further comprising dimethyl trisulphide.

11. The consumable according to any one of claims 1 to 5, wherein the consumable comprises the aliphatic aldehyde, such as 3-methylbutanal, and the at least two further compounds are selected from 2,4-dimethylpyridine, 2-ethyl-3,5-dimethylpyrazine, 2-furfurylthiol, and furaneol, such as wherein the at least two further compounds are furaneol and 2-ethyl-3,5-dimethylpyrazine, optionally further comprising 2,4-dimethylpyridine, 2-furfurylthiol, or a combination thereof.

12. An aerosolisable formulation for an aerosol provision system comprising the consumable according to any preceding claim, a carrier or a binder, and optionally nicotine, such as wherein the carrier is present at about 50 wt% or more, based on the total weight of the formulation, or wherein the binder is present and the binder comprises one or more gelling agent(s).

13. An aerosol provision system comprising an aerosol provision device and an aerosolisable formulation according to claim 12, such as wherein the aerosol provision system is non-combustible.

14. Use of a consumable as defined in any of claims 1 to 11, to modify at least one sensory property of an aerosolisable formulation, such as wherein the sensory property is flavour, and the flavour is modified relative to the aerosolisable formulation without the consumable.

15. Use of a consumable as defined in any of claims 1 to 11, to modify the tobacco flavour intensity of an aerosolisable formulation.

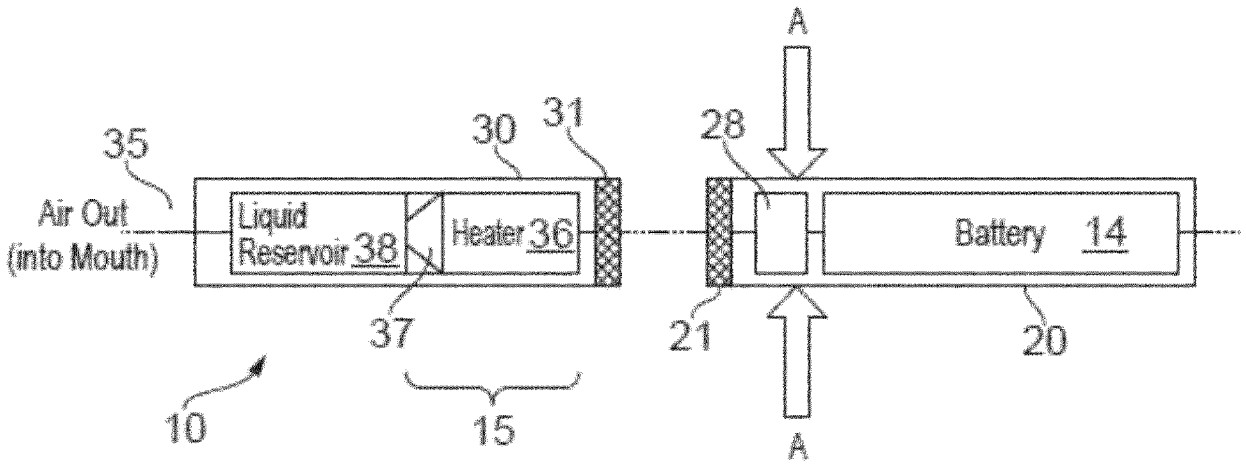

A
35
30
31
28
Air Out
(into Mouth)
Liquid
Reservoir 38
Heater 36
Battery 14
37
21
20
10
15
A

FIG. 1

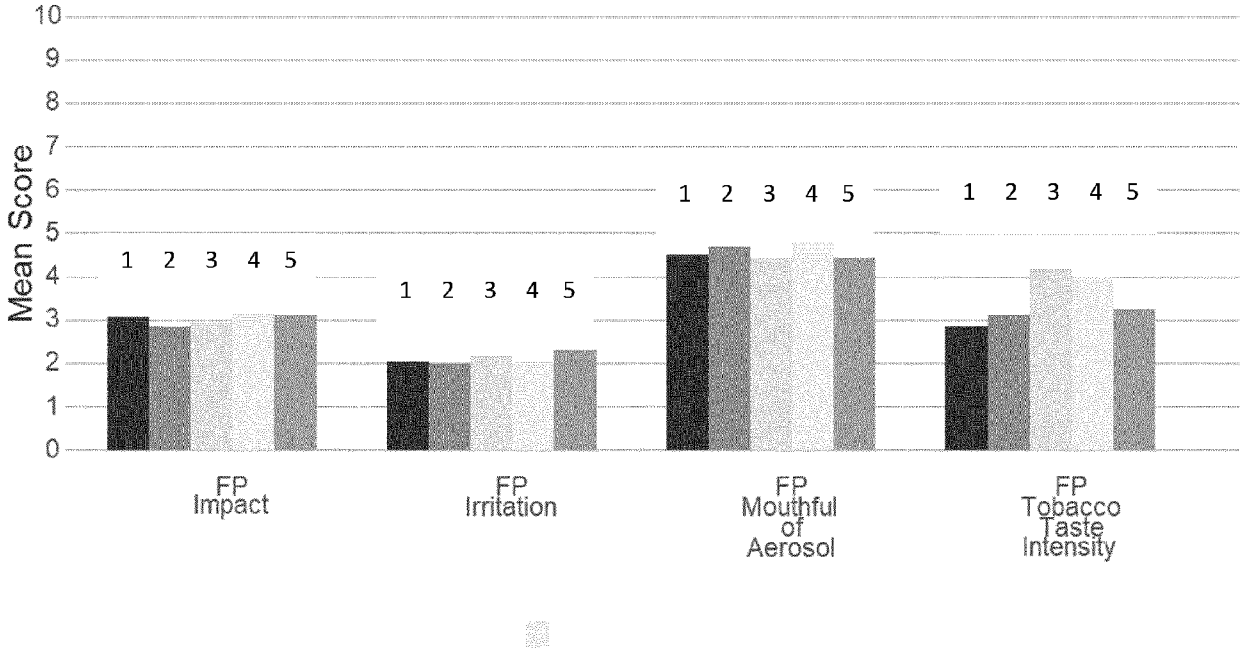

Mean Score
10
9
8
7
6
5
4
3
2
1
0
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
FP Impact
FP Irritation
FP Mouthful of Aerosol
FP Tobacco Taste Intensity

FIG. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 23 21 9410

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A24B
A24F
A24D
A23L

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	6 May 2024	Krajewski, Doris

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