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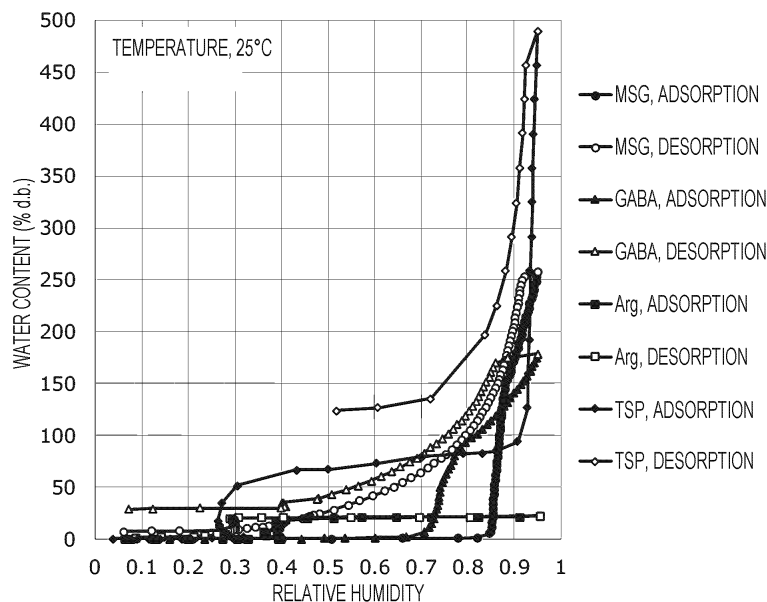
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(54) **ORAL POUCH PRODUCT CONTAINING AMINO ACID OR SALT THEREOF**

(57) Provided is an oral pouch product comprising a composition that contains (A) an amino acid or a salt thereof and (B) nicotine.

Fig. 1



Description

TECHNICAL FIELD

5 **[0001]** The present invention relates to an oral pouch product containing an amino acid or a salt thereof.

BACKGROUND ART

10 **[0002]** Oral tobacco products like snus are known (e.g., PTL 1). The user uses the product by placing it in the oral cavity. Incorporating an amino acid in an oral product for good nicotine delivery inside the oral cavity is known (e.g., PTL 2).

CITATION LIST

PATENT LITERATURE

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[0003]

PTL 1: International Publication No. 2012/133365

PTL 2: Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2010-526875

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SUMMARY OF INVENTION

TECHNICAL PROBLEM

25 **[0004]** PTL 2 specifically discloses an oral product in the form of, for example, tablets or gum. Meanwhile, oral pouch products, in which a composition containing nicotine is packed in a pouch for ease of handling and other purposes, are commercially available. These oral pouch products also face the challenge of improving the feel during use. Under such circumstances, an object of the present invention is to provide an oral pouch product with a good feel during use.

30 SOLUTION TO PROBLEM

[0005] The above problem is solved by the present invention described below.

Aspect 1

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[0006] An oral pouch product including a composition that contains:

(A) an amino acid or a salt thereof; and

(B) nicotine.

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Aspect 2

[0007] The oral pouch product according to aspect 1, wherein the component (A) has deliquescence.

45 Aspect 3

[0008] The oral pouch product according to aspect 2, wherein the component (A) is selected from the group consisting of glutamic acid, γ -aminobutyric acid, salts thereof, and combinations thereof.

50 Aspect 4

[0009] The oral pouch product according to aspect 1, wherein the component (A) is a basic amino acid.

Aspect 5

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[0010] The oral pouch product according to aspect 4, wherein the component (A) is selected from the group consisting of arginine, lysine, and a combination thereof.

Aspect 6

[0011] The oral pouch product according to aspect 1, wherein the composition contains, as the component (A):

an ingredient selected from the group consisting of glutamic acid, γ -aminobutyric acid, salts thereof, and combinations thereof (A1), and
an ingredient selected from the group consisting of arginine, lysine, salts thereof, and combinations thereof (A2).

Aspect 7

[0012] The oral pouch product according to any of aspects 1 to 6, wherein in the composition, 1% to 15% by weight of the component (A) is contained on a dry weight basis.

ADVANTAGEOUS EFFECTS OF INVENTION

[0013] According to the present invention, an oral pouch product with a good feel during use can be provided.

BRIEF DESCRIPTION OF DRAWINGS

[0014]

[Fig. 1] Fig. 1 presents water adsorption isotherms and desorption isotherms of different substances.

[Fig. 2] Fig. 2 presents external images of samples.

DESCRIPTION OF EMBODIMENTS

[0015] The present invention will now be described in detail. In the present invention, "(from) X to Y" includes its limits, i.e., X and Y. In the present invention, a weight represents a dry weight unless specified otherwise. An oral pouch product is a product intended for the user to ingest its active ingredient through the oral mucosa via saliva while the product is within the oral cavity.

1. Composition

[0016] A composition according to this embodiment is a composition for oral pouch products and contains (A) an amino acid or a salt thereof and (B) nicotine.

(1) Component (A): Amino Acid or Salt Thereof

[0017] An amino acid is a compound having a carboxyl group, which is an acidic group, and an amino group, which is a basic group, within its molecule. An amino acid salt is a compound in which the carboxyl group, the amino group, or part of a side chain has formed a salt. The counterion is not limited, but examples include cations of Group 1 metals in the Periodic Table, such as K and Na, and anions derived from mineral acids, such as hydrochloric acid.

[0018] An oral pouch product according to this embodiment presents a superior feel during use, but the advantages vary depending on the type of component (A). In the following, therefore, it will be described in different configurations. It should be noted that component (A) used in the first configuration and component (A) used in the second configuration can be used in combination.

[First Configuration]

[0019] Component (A) in this configuration has deliquescence. A component (A) having deliquescence limits excessive movement of saliva into the composition during use because it transitions to a state in which it has undergone a phase change from solid to liquid or a state close to it inside the user's mouth. As a result, the sensation of dryness during use can be reduced.

[0020] In one configuration, an amino acid or a salt thereof having deliquescence means that when the water adsorption and desorption isotherms of the amino acid or salt thereof are acquired, the amino acid or salt has a percentage water adsorption of 100% by weight or more at a relative pressure of 0.9. An oral pouch product including a composition containing such an amino acid or salt thereof achieves a reduced sensation of dryness during use.

[0021] Examples of components (A) having deliquescence include glutamic acid, γ -aminobutyric acid (also referred to

as "GABA"), and salts thereof. One or multiple types of them can be used. When the amount of component (A) is excessively small, the aforementioned advantages are insufficient, but when it is excessively large, the savor may be impaired. For such reasons, it is preferred that the amount of component (A) in the composition be from 0.01% to 20% by weight. The lower limit is preferably 1% by weight or more, 2% by weight or more, or 5% by weight or more. The upper limit, furthermore, is more preferably 15% by weight or less, even more preferably 10% by weight or less. In addition, the amount of component (A) is preferably from 5% to 30% by weight, more preferably from 10% to 20% by weight, in relation to the substrate described later herein, which is component (C).

[Second Configuration]

[0022] Component (A) in this configuration is a basic amino acid. An oral pouch product made with such a component (A) presents the user with a moderate smoke taste, with little foreign discomfort. The mechanism behind this is not limited, but the inventors consider it as follows.

[0023] It is known that when the pH of a composition for oral pouch products is adjusted to 8 to 9, the composition provides the user with a moderate smoke taste. In the related art, the pH of the composition has been adjusted using an aqueous solution of an inorganic salt, such as a phosphate, carbonate, or chloride salt. Meanwhile, amino acids are water-soluble and have a buffering capacity because of an amino group (pKa = 8.8 to 10.6) and a carboxyl group (pKa = 1.8 to 2.8) (see, for example, Japanese Unexamined Patent Application Publication (Translation of PCT Application) No. 2010-526875). The pK and pI of typical inorganic ions and amino acids are presented in Table 1. Amino acids having a pKa near a pH of 8 to 9 are considered suitable for adjusting the pH of the composition to 8 to 9. In particular, arginine and lysine have their isoelectric points in the basic region and exhibit high solubility in water. Compositions containing these amino acids as an aqueous solution, therefore, have a pH of approximately 8 to 9 and present the user with a moderate smoke taste while reducing the known, inorganic salt-derived foreign discomfort. It should be noted that the pH of the composition is measured in a supernatant obtained by suspending 2 g of the composition in 20 ml of distilled water.

[0024] In one configuration, therefore, a basic amino acid is an amino acid whose isoelectric point (pI) is in the basic region. The isoelectric point is preferably 9 or higher, more preferably 10 or higher. The upper limit to the isoelectric point is not limited, but preferably is 13 or lower. Component (A) is preferably selected from the group consisting of arginine (Arg), lysine, and the combination thereof. The amount of component (A) in this configuration is as described in the first configuration.

[Table 1]

Table 1 pKa (dissociation constants) of Inorganic Ions and pKa and pI (isoelectric points) of Amino Acids						
Inorganic ion		pKa				
Carbonate ion		3.6	10.25			
Phosphate ion		2.12	7.21	12.67		
Ammonium ion		9.25				
Amino acid	Abbreviation	pKa (-COOH group)	pKa (-NH ₃ group)	pKa (others)	pI	
Alanine	Ala	2.34	9.69	-	6	
Arginine	Arg	2.17	9.04	12.48	10.76	
Asparagine	Asn	2.02	8.8	-	5.41	
Aspartic acid	Asp	1.88	9.6	3.65	2.77	
Cysteine	Cys	1.96	10.28	8.18	5.07	
Glutamic acid	Glu	2.19	9.67	4.25	3.22	
Glutamine	Gln	2.17	9.13	-	5.65	
Glycine	Gly	2.34	9.6	-	5.97	
Histidine	His	1.82	9.17	6	7.59	
Hydroxyproline	Hyp	1.82	9.65	-	-	
Isoleucine	Ile	2.36	9.6	-	6.02	
Leucine	Leu	2.36	9.6	-	5.98	
Lysine	Lys	2.18	8.95	10.53	9.74	
Methionine	Met	2.28	9.21	-	5.74	
Phenylalanine	Phe	1.83	9.13	-	5.48	
Proline	Pro	1.99	10.6	-	6.3	
Pyroglutamic acid	Glp	-	-	-	5.68	

(continued)

Amino acid	Abbreviation	pKa (-COOH group)	pKa (-NH ₃ group)	pKa (others)	pI
Serine	Ser	2.21	9.15	-	5.68
Threonine	Thr	2.09	9.1	-	5.6
Tryptophan	Trp	2.83	9.39	-	5.89
Tyrosine	Tyr	2.2	9.11	10.07	5.66
Valine	Val	2.32	9.62	-	5.96
γ -Aminobutyric acid	GABA	4.23	10.43	-	7.3

Source of the amino acid characteristics

<https://www.sigmaaldrich.com/JP/ja/technical-documents/technical-article/protein-biology/protein-structural-analysis/amino-acid-reference-chart>

(2) Component (B): Nicotine

[0025] The composition contains nicotine. The nicotine may be contained alone or may be contained in the form of a nicotine-containing raw material. A nicotine-containing raw material refers to a raw material containing nicotine, such as a nicotine salt or stabilized nicotine. An example of stabilized nicotine is a nicotine carrier, such as nicotine supported on an ion-exchange resin. An example of an ion-exchange resin is a weakly acidic cation-exchange resin. An ion-exchange resin with nicotine supported on it can specifically be a resin complex that contains, for example, 10% by weight or more and 20% by weight or less nicotine, referred to as nicotine polacrillex. The ion-exchange resin used in nicotine polacrillex is a weakly acidic cation-exchange resin. When nicotine polacrillex is used, its amount added in relation to the composition is typically 0.5% by weight or more, preferably 1.0% by weight or more, more preferably 2.0% by weight or more. For savor reasons, however, the amount of nicotine polacrillex added in relation to the composition is typically 15.0% by weight or less, preferably 12.0% by weight or less, more preferably 10.0% by weight or less.

[0026] Moreover, a nicotine-containing raw material may be, for example, a tobacco material containing a tobacco powder obtained by grinding tobacco leaves. The tobacco powder may include constituents such as shreds, fine powder, or fibers of the lamina of dried tobacco leaves and is prepared by, for example, the method described below. The tobacco leaves may include the lamina, the stem, or the root. Besides a tobacco powder basically obtained from the lamina of tobacco leaves, the tobacco material may contain components derived from the midrib or root of tobacco leaves.

[0027] The particle diameter of the tobacco powder is not limited. In order for the composition to fit well inside the oral cavity and feel better during use and for good release of a flavor component contained in the tobacco powder into the oral cavity, however, it is preferred that the tobacco powder be one that has passed through a 1.2-mm mesh. More preferably, the tobacco powder is one that has passed through a 1.0-mm mesh.

[0028] The tobacco species that serves as a raw material for the tobacco powder is not particularly limited. Examples include species within the *Nicotiana* genus, such as the flue-cured and burley cultivars of *Nicotiana tabacum* and the Brazilian cultivar of *Nicotiana rustica*. For the tobacco material and tobacco leaves, described later herein, too, the same species as these can be used.

[0029] The tobacco powder is preferably prepared as follows. First, a base is added to and mixed with a tobacco powder obtained by grinding tobacco leaves. The base that is added can be, for example, potassium carbonate or sodium carbonate, and it is preferred to add it as an aqueous solution. A pH-adjusting agent like sodium dihydrogenphosphate, furthermore, may be added, for example for the stabilization of nicotine during the manufacture of the oral pouch product. The pH of the mixture after the addition of the base is preferably adjusted to 8.0 to 9.0. The percentage of the tobacco powder in this mixture is preferably from 60% to 90% by weight.

[0030] After the addition of the base, heating is performed, for example for 0.5 to 3 hours, preferably 0.8 to 2 hours, for example under conditions under which the mixture temperature will be from 65°C to 90°C, preferably the mixture temperature will be from 70°C to 80°C. Through this, the sterilization of the tobacco powder is carried out. The heating can be performed by either one or both of heating by steam injection and heating with a jacket. The pH of the mixture after heating is preferably from 8.0 to 9.0, and the water content of the mixture after heating is preferably from 10% to 50% by weight.

[0031] After heating, in an embodiment, the resulting processed tobacco powder may be subjected to drying treatment by performing heating with a jacket alone, optionally after stopping steam injection. Then the powder may be cooled at approximately 15°C to 25°C for approximately 1 hour.

[0032] When a tobacco material containing a tobacco powder is used, its amount added in relation to the composition is typically 0.001% by weight or more, preferably 0.01% by weight or more, more preferably 0.05% by weight or more. For savor reasons, however, the amount of the material added in relation to the composition is typically 90% by weight or less, preferably 80% by weight or less, 70% by weight or less, 45% by weight or less, 40% by weight or less, or 30% by weight or

less.

[0033] A nicotine-containing raw material may be a nicotine-containing extract obtained through extraction from a nicotine-containing substance, such as tobacco leaves.

[0034] Of the forms described above, the use of a nicotine carrier is particularly preferred from the viewpoints of appropriate supply of nicotine and the ease of handling. In addition, when a tobacco powder is added, the color of the composition and the oral product usually tends to be the color of the tobacco leaves. When a colorless nicotine-containing compound is used, however, it is possible to provide a white composition and oral product. For those users who like white oral products, such a form is an advantage. One raw material as described above may be used, or two or more may be used in combination.

[0035] The percentage of total nicotine in the composition is not limited, but for palatability to users, it is typically from 0.1% to 20.0% by weight. When a nicotine-containing raw material is used, therefore, the amount of the raw material is adjusted so that the total nicotine percentage will fall within this range. When the nicotine is present as ions, this percentage is a percentage as nicotine ions. The percentage of nicotine in the composition can be measured by, for example, gas chromatography-mass spectrometer (GC-MS) or liquid chromatography (LC, UV detection).

(3) Substrate

[0036] The composition preferably contains a substrate. The substrate is not particularly limited, and examples include polysaccharides or porous structures capable of adsorbing and holding water. Specifically, the substrate is preferably one or more selected from the group consisting of silica, cellulose, microcrystalline cellulose (MCC), spherical cellulose, and porous cellulose. More preferably, the substrate is cellulose or silica in particular, for flexibility in the adjustment of the bulk density of the composition and because it displays a white color. One such substance may be used alone, or two or more may be used in combination in any proportions.

[0037] The percentage of the substrate in the composition (when the composition contains two or more substrates, their total percentage) is not limited. In order that a quality improvement will be sought by reducing the exudation of water during manufacture or product storage and that an appearance desirable to users will be imparted through the enhancement of the whiteness of the product, however, the percentage is typically 10% by weight or more. Preferably, the percentage is 15% by weight or more, more preferably 20% by weight or more. The upper limit to this percentage, furthermore, is not limited, but in view of the limits on how much other raw materials can be contained, the percentage is typically 70% by weight or less. Preferably, the percentage is 68% by weight or less, more preferably 65% by weight or less.

(4) Sugar Alcohol

[0038] The composition preferably contains a sugar alcohol. The type of sugar alcohol is not particularly limited, and examples include xylitol, maltitol, erythritol, sorbitol, mannitol, and lactitol. Of these, maltitol is preferred from the viewpoint of imparting a good savor. One such substance may be used alone, or two or more may be used in combination in any proportions.

[0039] The percentage of the sugar alcohol in the composition (when the composition contains two or more sugar alcohols, their total percentage) is not limited, but for savor adjustment reasons, it is typically 1% by weight or more. Preferably, the percentage is 5% by weight or more, more preferably 10% by weight or more. Its upper limit, furthermore, is typically 80% by weight or less, preferably 70% by weight or less, more preferably 60% by weight or less.

(5) Polyglycerin Fatty Acid Ester

[0040] The composition preferably contains a polyglycerin fatty acid ester. The degree of polymerization of glycerin in the polyglycerin fatty acid ester is preferably from 2 to 10. The polyglycerin fatty acid ester functions as an emulsifier. Incorporating a polyglycerin fatty acid ester, therefore, ensures that a state in which the ingredients in the composition are evenly mixed will be held. The flavor component can be kept in a stable state, which helps achieve a good flavor of the composition. The polyglycerin fatty acid ester, furthermore, imparts moderate viscosity to the composition, allowing its ingredients to be bound together. The ester, therefore, retards the stiffening and drying of the composition, helping achieve good characteristics, such as feel during use and flavor. In addition to these, the ester helps reduce the scattering of the composition during its packing in the pouches or other exterior material even when the composition is of dry type, in which the amount of water (the water content) is small. Overall, incorporating a polyglycerin fatty acid ester in the composition leads to improvements in efficiency in the manufacture of the oral product, such as operational efficiency and production yield.

[0041] Polyglycerin fatty acid esters are fatty acid esters of a dehydration condensate of glycerin. The degree of polymerization of the glycerin is typically two or greater and may be three or greater, and typically is ten or less and may be eight or less.

[0042] Fatty acid ester groups (RCOO- groups) in a polyglycerin fatty acid ester are derived from a fatty acid. The fatty acid is not limited; it may be a saturated fatty acid or may be an unsaturated fatty acid. The number of carbons in the fatty acid, furthermore, is typically 10 or more for a good flavor and manufacturing efficiency reasons. Preferably, the number of carbons is 12 or more, more preferably 14 or more, even more preferably 16 or more. Typically, furthermore, the number of carbons is 30 or fewer, preferably 26 or fewer, more preferably 22 or fewer, even more preferably 20 or fewer. The fatty acid may have a substituent or may be unsubstituted.

[0043] Moreover, the number of fatty acid ester groups that one molecule of the polyglycerin fatty acid ester has is not limited, provided that the polyglycerin fatty acid ester has a structure that allows it to serve a function as an emulsifier; it can be selected as appropriate according to the degree of polymerization of glycerin and the number of glycerin-derived hydroxyl groups. A structure that allows the polyglycerin fatty acid ester to serve a function as an emulsifier is a structure having both of a fatty acid moiety, which serves as a lipophilic group, and a polyhydric alcohol moiety, which serves as a hydrophilic group. Specifically, the number of fatty acid ester groups per molecule of the polyglycerin fatty acid ester only needs to be one or more in general. The number of glycerin-derived hydroxyl groups, furthermore, only needs to be one or more.

[0044] The degree of polymerization of glycerin and the type and number of fatty acid ester groups in the polyglycerin fatty acid ester can be chosen in any combination from the options presented above. More specifically, the alcohol component of the polyglycerin fatty acid ester can be diglycerin, triglycerin, tetraglycerin, pentaglycerin, hexaglycerin, heptaglycerin, octaglycerin, nonaglycerin, or decaglycerin. The acid component of the polyglycerin fatty acid ester can be a fatty acid such as lauric acid, myristic acid, palmitic acid, stearic acid, oleic acid, linoleic acid, or α -linolenic acid. The polyglycerin fatty acid ester, furthermore, can be, for example, a monoester, diester, triester, tetraester, or pentaester. One ester may be used alone as a polyglycerin fatty acid ester, or two or more may be used in combination in any proportions.

[0045] For a good flavor and the ease of operation during manufacture, the polyglycerin fatty acid ester is preferably one or more selected from diglycerin monofatty acid esters and decaglycerin fatty acid esters. A diglycerin monofatty acid ester is preferably selected from the group consisting of diglycerin monolaurate, diglycerin monomyristate, diglycerin monopalmitate, diglycerin monostearate, and diglycerin monooleate, more preferably is diglycerin monooleate. A decaglycerin fatty acid ester is preferably selected from the group consisting of decaglycerin laurates, decaglycerin myristates, decaglycerin palmitates, decaglycerin stearates, and decaglycerin oleates, more preferably is selected from the group consisting of decaglycerin monolaurate, decaglycerin monomyristate, decaglycerin monopalmitate, decaglycerin monostearate, and decaglycerin monooleate.

[0046] The percentage of the polyglycerin fatty acid ester in the composition (when the composition contains two or more polyglycerin fatty acid esters, their total percentage) is not limited, but for a good flavor to be obtained and for improved manufacturing efficiency, the percentage is typically 0.1% by weight or more. Preferably, the percentage is 0.2% by weight or more, more preferably 0.3% by weight or more, even more preferably 0.5% by weight or more. In order for moderate viscosity to be imparted to the composition, furthermore, the percentage of the polyglycerin fatty acid ester is typically 20.0% by weight or less. Preferably, the percentage is 15.0% by weight or less, more preferably 10.0% by weight or less, even more preferably 8.0% by weight or less.

[0047] The HLB value of the polyglycerin fatty acid ester is not limited, but for a good flavor to be obtained and for improved manufacturing efficiency, the HLB value is typically 6.0 or greater, preferably 7.0 or greater. In addition, the HLB value is typically 20.0 or less, preferably 18.0 or less, more preferably 16.0 or less.

(6) Release Agent

[0048] The composition preferably contains a release agent. The release agent mitigates troubles like the adhesion of ingredients to manufacturing devices, such as a mixer and a kneader, during the manufacture of the composition or the adhesion of ingredients, for example to a packer, during the packing of the composition in the pouches, helping improve manufacturing efficiency. The release agent, furthermore, reduces caking (aggregation or solidification of the materials constituting the composition) by decreasing the adhesiveness between the materials and helps reduce the stickiness of the composition as well. As a result, the appearance, feel during use, such as feel in the mouth, flavor, etc., of the oral product including the composition improve. In addition, the release agent allows for the reduction of the leakage of the composition from the pouches, helping improve the characteristics of the oral product.

[0049] The release agent is not limited, provided that it delivers the above advantages. Examples of release agents include compounds such as particulate silicon dioxide, magnesium oxide, calcium silicate, magnesium silicate, calcium phosphate, calcium stearate, and magnesium stearate. Of these, it is preferred that the release agent be silicon dioxide because it is superior in the advantages described above and has little impact on flavor. One release agent may be used alone, or two or more may be used in combination in any proportions. When silica (silicon dioxide) is used as a substrate, however, it is also possible not to use a release agent.

[0050] The release agent is preferably in particulate form so that it will deliver the above advantages sufficiently. For improved manufacturing efficiency, the average diameter of the particles is typically 20.0 μm or less. Preferably, the

average particle diameter is 15.0 μm or less, more preferably 10.0 μm or less. The average particle diameter, furthermore, is typically 0.2 μm or more, preferably 0.3 μm or more, more preferably 0.4 μm or more, even more preferably 1.0 μm or more. In the present invention, the average diameter of release agent particles represents the particle diameter at a cumulative volume-based percentage of 50% (D50) in a particle size distribution determined through laser diffraction particle size distribution measurement. The laser diffraction particle size distribution measurement can be performed using a general-purpose device, such as "Mastersizer 3000," manufactured by Malvern Panalytical Ltd. In the present invention, furthermore, silicon dioxide having such an average particle diameter may be referred to as "particulate silicon dioxide."

[0051] The percentage of the release agent in the composition (when the composition contains two or more release agents, their total percentage) is not limited, but to ensure a good flavor and for the agent to deliver the above advantages sufficiently, the percentage is typically 0.05% by weight or more. Preferably, the percentage is 0.1% by weight or more, more preferably 0.5% by weight or more. The percentage, furthermore, is typically 3.0% by weight or less, preferably 2.5% by weight or less, more preferably 2.0% by weight or less.

(7) Water

[0052] The percentage of water in (water content of) the composition is typically 5% by weight or more for the ease of manufacture of the composition. From viewpoints such as improving efficiency in the manufacture of the composition, improving the anticaking properties of the composition, and reducing the stickiness of the composition, furthermore, it is preferred that the lower limit to the percentage of water be 30% by weight or more, more preferably 45% by weight or more. The upper limit is typically 60% by weight or less, preferably 50% by weight or less. In addition, the percentage of water may be 40% by weight or less, may be 30% by weight or less, or may be 20% by weight or less. The percentage of water can be controlled by adjusting the amount of water added and providing heating treatment or drying treatment during the manufacturing stage. The percentage of water in the composition is controlled as appropriate according to the type of product (moist or dry). In the case of the moist type, for example, the percentage of water is typically from 20% to 60% by weight, preferably from 30% to 50% by weight. By contrast, in the case of the dry type, the percentage of water is typically from 5% to 20% by weight, preferably from 10% to 15% by weight.

[0053] The percentage of water in (water content of) the composition can be measured using a heat-drying moisture analyzer (e.g., HB 43-S: manufactured by METTLER TOLEDO). For the measurement, a sample is put into a pre-determined container and heated to an attained temperature of 100°C. The measurement is concluded at the time when the amount of change becomes 1 mg or less per 60 seconds, and the water content is calculated from the measured weights before and after heating.

(8) Others

[0054] Besides the foregoing, the composition may contain additional substances. Examples of additional substances include flavoring agents, pH-adjusting agents, sweeteners (excluding sugar alcohols), humectants, bitterness reducers, white coloring agents (excluding silicon dioxide), and emulsifiers (excluding polyglycerin fatty acid esters). The percentages of the substances are not limited; the amounts can be adjusted as appropriate according to the product design.

1) Flavoring Agent

[0055] Flavoring agents are not limited, and examples include menthol, leaf tobacco extract, natural vegetable flavoring agents (e.g., cinnamon, sage, herbs, chamomile, kudzu, sweet hydrangea leaves, clove, lavender, cardamom, caryophyllus, nutmeg, bergamot, geranium, honey essence, rose oil, lemon, orange, cinnamon bark, caraway, jasmine, ginger, coriander, vanilla extract, spearmint, peppermint, cassia, coffee, celery, cascarilla, sandalwood, cocoa, ylang-ylang, fennel, anise, licorice, St. John's bread, plum extract, and peach extract), saccharides (e.g., glucose, fructose, isomerized sugar, caramel, honey, and molasses), types of cocoa (powder, extract, etc.), esters (e.g., isoamyl acetate, linalyl acetate, isoamyl propionate, and linalyl butyrate), ketones (e.g., menthone, ionone, damascenone, and ethyl maltol), alcohols (e.g., geraniol, linalool, anethole, and eugenol), aldehydes (e.g., vanillin, benzaldehyde, and anisaldehyde), lactones (e.g., γ -undecalactone and γ -nonalactone), animal flavoring agents (e.g., musk, ambergris, civet, and castoreum), and hydrocarbons (e.g., limonene and pinene). One such substance may be used alone as a flavoring agent, or two or more may be used in combination in any proportions.

2) pH-Adjusting Agent

[0056] pH-adjusting agents are not limited, and examples include sodium carbonate, sodium hydrogencarbonate, potassium carbonate, potassium hydrogencarbonate, potassium phosphate, anhydrous sodium phosphate, sodium

dihydrogenphosphate, and sodium citrate. Of these, sodium carbonate, potassium carbonate, or sodium dihydrogenphosphate is particularly preferred from the viewpoint of impact on the taste that the product exhibits. One such substance may be used alone as a pH-adjusting agent, or two or more may be used in combination in any proportions. When the amino acid described above serves as a pH-adjusting agent, however, the pH-adjusting agent described here may be omitted, or the pH of the product may be adjusted to a predetermined range by using the amino acid and the pH-adjusting agent mentioned here in combination.

3) Sweetener

[0057] Examples of sweeteners include, although not limited, sugar alcohols, such as xylitol, maltitol, and erythritol; and substances such as acesulfame potassium, sucralose, and aspartame. Sugar alcohols are preferred from the viewpoint of taste adjustment. One sweetener may be used alone, or two or more may be used in combination in any proportions.

4) Bitterness Reducer

[0058] Bitterness reducers are not limited, but an example is soybean lecithin. Soybean lecithin is phospholipids, with specific examples including phosphatidylcholine, phosphatidylethanolamine, and phosphatidic acid. One such substance may be used alone as a bitterness reducer, or two or more may be used in combination in any proportions.

5) Humectant

[0059] Humectants are not limited, but examples include polyhydric alcohols, such as glycerin and propylene glycol. From the viewpoint of product storability, glycerin is preferred. One such substance may be used alone as a humectant, or two or more may be used in combination in any proportions.

6) White Coloring Agent

[0060] White coloring agents are not limited, but examples include particulate silicon dioxide, titanium dioxide, and calcium carbonate. From the viewpoint of the impact of taste on the product, particulate silicon dioxide is preferred. One such substance may be used alone as a white coloring agent, or two or more may be used in combination in any proportions.

7) Emulsifier or Surfactant

[0061] Emulsifiers (excluding polyglycerin fatty acid esters) are not limited, but examples include emulsifiers that are added to food. An example of an emulsifier is one or more selected from the group consisting of sucrose fatty acid esters, organic acid glycerin fatty acid esters, polyglycerin fatty acid esters, and lecithins. Examples of sucrose fatty acid esters include sucrose palmitate and sucrose stearate. Examples of organic acid glycerin fatty acid esters include succinic acid glycerin fatty acid esters and diacetyltartaric acid glycerin fatty acid esters. Examples of polyglycerin fatty acid esters include decaglycerin fatty acid esters. The percentage of emulsifiers in the composition is preferably an amount that makes the total percentage including the polyglycerin fatty acid ester described above fall within the ranges specified above as percentages of polyglycerin fatty acid esters.

8) Gelling Agent or Gelling Aid

[0062] For use as gelling agents, polysaccharides having a carboxyl group are preferred; for example, carrageenan, pectin, gum arabic, xanthan, gellan, and gum tragacanth are preferred. Carrageenan, pectin, and gellan, furthermore, are preferred because they easily gel in the presence of calcium ions and are capable of forming a crosslink structure by creating junction zones with carboxyl groups and cations. One such substance may be used alone, or two or more may be used in combination in any proportions.

[0063] An example of an ingredient that aids in gelation is calcium ions, and examples of their sources (gelling aids) include, although not limited, hydrogen halide salts (e.g., chloride), citric acid, the carbonate, the sulfate, the phosphate, and the lactate of calcium. Of these, calcium lactate, calcium chloride, or calcium phosphate is preferred because of small impact on taste, high solubility, and the pH after dissolution. In particular, calcium lactate is preferred. One such substance may be used alone, or two or more may be used in combination in any proportions.

[0064] Examples of ingredients that aid in gelation other than calcium ions include ions of metals such as magnesium, silver, zinc, copper, gold, and aluminum, with which the gelling agent can be bound via ionic bonds in the same manner as with calcium ions, and ions of cationic polymers. Examples of their sources (other gelling aids) include hydrogen halide

salts (e.g., chlorides), citric acid, carbonates, sulfates, and phosphates of these metal ions and cationic polymers. One such substance may be used alone, or two or more may be used in combination in any proportions.

(9) Characteristics

1) Flowability

[0065] Based on the flowability of the composition, the viscosity, adhesion to manufacturing devices, anticaking properties, and stickiness of the composition can be evaluated. The flowability is evaluated through a relative comparison of a shear stress value at a normal stress of 5.0 kPa at a measuring temperature of 22°C. The normal stress of 5.0 kPa is a pressure load expected to be applied to the composition under its own weight, for example during its manufacture, transport, or storage, as a condition under which the adhesion to manufacturing devices, caking, and stickiness of the composition can arise. The shear stress is preferably 4.15 kPa or more, more preferably 4.20 kPa or more, even more preferably 4.25 kPa or more, and preferably is 5.85 kPa or less, more preferably 5.80 kPa or less.

[0066] This shear stress of the composition at a normal stress of 5.0 kPa can be measured using a rheometer. For example, when the rheometer used is FT4 Powder Rheometer, manufactured by Freeman Technology Ltd., the shear stress is measured under the following measuring conditions.

- Measurement mode: standard program (25mm_shear_9kPa)
- Measuring temperature: 22°C
- Measuring humidity: 60%RH
- Measuring vessel: A cylindrical vessel with an inside diameter of 25 mm; volume, 10 ml
- Normal loads: 3 to 9 kPa

[0067] The raw materials of interest are each sieved (1.18-mm mesh), and the resulting fine and uniform particles are used as samples for measurement. Measurement is performed according to the procedure for the rheometer.

2) Particle Size

[0068] The composition is preferably composed of multiple solid granular pieces, but the size of the granular pieces is not limited. For a good feel in the mouth during use by the user, the ease of handling during manufacture, and controlled variations in quality, the composition is typically of a size where it passes through a sieve having a sieve aperture of 15 mm (< 15 mm) after being dried. Preferably, the dried composition is of a size where it passes through a sieve having a sieve aperture of 10 mm (< 10 mm), more preferably of a size where it passes through a sieve having a sieve aperture of 5 mm (< 5 mm), even more preferably of a size where it passes through a sieve having a sieve aperture of 3.2 mm (< 3.2 mm). For example, when all of the composition dried to a water content of 5% by weight or less has passed through a sieve with a sieve aperture of 3.2 mm, it indicates that the maximum particle size after drying of the composition is 3.2 mm or less. There is no need to set the lower limit to the particle size of the composition after drying, but typically, the particle size is 3 μm or more for the prevention of leakage from the pouches.

[0069] The method for preparing the dried composition described above is not limited, provided that it allows for the reduction of the water content to 5% by weight or less, but an example is the method of preparing it by allowing the oral composition to stand for a predetermined duration under temperature conditions such as normal temperature or 70°C to 80°C. The maximum particle size of the composition can be controlled as appropriate, for example by adjusting the particle size, water content, etc., of the ion-exchange resin with nicotine supported on it.

3) pH

[0070] The pH of the composition is not limited, but typically is 7.0 or higher because of impact on taste. Preferably, the pH is 7.5 or higher, more preferably 8.0 or higher. The pH, furthermore, is typically 10.0 or lower, preferably 9.5 or lower, more preferably 9.0 or lower. This pH is a measured value at 25°C.

[0071] The pH of the composition at a measuring temperature of 25°C can be measured using a pH analyzer (e.g., LAQUA F-72 with a flat ISFET pH electrode: manufactured by HORIBA, Ltd.), by adding 20 mL of water to 2 g of the composition, shaking the mixture for 10 minutes, and analyzing the supernatant. The calibration of the equipment is performed preferably by three-point calibration using a phthalate pH standard solution (pH 4.01), a phosphate pH standard equimolar solution (pH 6.86), and a tetraborate pH standard solution (pH 9.18) (all from Wako Pure Chemical Industries, Ltd.).

2. Oral Pouch Product

[0072] The oral pouch product is used by taking it in the mouth. The oral pouch product includes a main material (composition) and a pouch in which the main material is packaged (also referred to as an exterior material).

(1) Pouch

[0073] The pouch is not limited and can be a known one, provided that it allows the composition to be packaged therein, is insoluble in water, and, at the same time, is permeable to liquids (e.g., water and saliva) and water-soluble ingredients in the composition. An example of a material for the pouch is cellulose-based nonwoven fabric, and commercially available nonwoven fabric may also be used. The pouch product can be produced by shaping a sheet made from such a material into a bag, packing the composition into the bag, and sealing the bag by means such as heat sealing.

[0074] The grammage of the sheet is not particularly restricted and typically is 12 gsm or more and 54 gsm or less, preferably 24 gsm or more and 30 gsm or less. The thickness of the sheet is not particularly restricted and typically is 100 μm or more and 300 μm or less, preferably 175 μm or more and 215 μm or less.

[0075] At least one of the inner surface or outer surface of the pouch may be partially coated with a water-repellent material. For use as the water-repellent material, a water-repellent fluoropolymer is suitable. Specifically, an example of a water-repellent fluoropolymer of this type is AsahiGuard[®], manufactured by Asahi Glass Co., Ltd. Water-repellent fluoropolymers are used to coat packaging materials for fat-containing foods and products, including confectionery, dairy products, ready-prepared foods, fast food, and pet food. Water-repellent fluoropolymers of this type, therefore, are safe even when applied to a pouch intended to be placed in the oral cavity. This water-repellent material is not limited to fluoropolymers; it may be a material having a water-repellent effect such as a paraffin resin, silicone resin, or epoxy resin.

[0076] The pouch may contain any ingredients. Examples of such ingredients include raw materials for adjusting flavor and taste, flavoring agents, additives, tobacco extract, and colorants. The form in which these ingredients are contained, furthermore, is not limited, and examples include the form in which the ingredients are applied to the surface of the pouch or infiltrated into the pouch and, when the pouch is made of fibers, the form in which the ingredients are incorporated into the fibers.

[0077] The appearance of the pouch is not limited either. The pouch may be nontransparent, translucent, or transparent. When the pouch is translucent or transparent, the packed composition is visible through it.

[0078] The size of the oral pouch product is not limited. For the size of the product before use, the lower limit to the longer sides may be 25 mm or more, 28 mm or more, 35 mm or more, or 38 mm or more. The upper limit, furthermore, may be 40 mm or less. The lower limit to the shorter sides may be 10 mm or more or 14 mm or more. The upper limit, furthermore, may be 20 mm or less or 18 mm or less. The percentage of the weight of the composition to the total weight of the oral pouch product is typically 80% by weight or more, although not limited. Preferably, the percentage is 85% by weight or more, more preferably 90% by weight or more. The percentage, furthermore, is typically 99% by weight or less, preferably 97% by weight or less, more preferably 95% by weight or less.

(2) Composition

[0079] The composition packed in the pouch is also referred to as filling. The amount of filling per unit of the oral pouch product is preferably from 0.4 to 1.5 g.

3. Manufacturing Method

(1) Manufacture of the Composition

[0080] The composition is manufactured by any method, but preferably is manufactured through a step of mixing at least components (A) and (B) and optionally a substrate, a sugar alcohol, a polyglycerin fatty acid ester, and a release agent. The mixing can be carried out by introducing all raw materials into a mixer and mixing them.

[0081] In a preferred manufacturing method, component (A), component (B), a substrate, a sugar alcohol, a release agent, and optionally water and other substances (e.g., a sweetener, a flavoring agent, and a humectant) are first mixed together to give a first mixture. Heating may be performed during this. The order of mixing of the raw materials, furthermore, is not limited; the materials may be put into the mixer and mixed together in any order or simultaneously, or solid raw materials may be mixed until uniform before adding liquid raw materials and further mixing. When the ease of operation is considered, the latter approach is preferred.

[0082] Then a polyglycerin fatty acid ester solution is sprayed onto the first mixture while the first mixture is stirred, through which the first mixture and the polyglycerin fatty acid ester are mixed together, giving a second mixture. Because the polyglycerin fatty acid ester will produce an anticaking effect, caking will be less likely to occur in subsequent steps. The

solvent for the polyglycerin fatty acid ester solution is not limited, provided that the polyglycerin fatty acid ester can be dissolved in it, but preferably is an alcohol solvent, such as ethanol. To prevent much of the solvent for the polyglycerin fatty acid ester solution from remaining in the second mixture, heating treatment may be applied during or after the end of the spraying of the polyglycerin fatty acid ester solution onto the first mixture.

[0083] After the preparation of the second mixture, furthermore, a treatment in which the second mixture is dried may be performed (drying step). After that, a treatment in which the mixture is cooled may be performed. The cooling may be natural cooling or may be performed using some cooling means (cooling step). By performing drying, the water content of the second mixture can be adjusted, for example to a desired value within the range of 5% to 60% by weight. This facilitates the adjustment of the water content of the composition.

[0084] To the mixture obtained as described above, an aqueous solution containing a pH-adjusting agent, a sweetener, such as acesulfame potassium, a flavoring agent, such as menthol, a bitterness reducer, such as soybean lecithin, and a humectant, such as glycerin, can optionally be added (additive addition step). These additives may be added as solids or may be added as aqueous solutions, in which the additives have been dissolved in water. When added as aqueous solutions, the additives may be pre-dissolved in a predetermined amount of water before addition so that the final water content of the oral product can be achieved.

(2) Manufacture of the Oral Pouch Product

[0085] By packaging the composition with the pouch (exterior material), the oral pouch product can be manufactured (packaging step). The method for packaging the composition is not limited, and known methods can be applied. For example, known methods such as the method of putting the composition into a bag-shaped nonwoven fabric and then sealing the bag can be used. In the packaging step, desired additional water may be added after sealing (hydration step). For example, when the percentage of water in the final composition is 50% by weight and when the percentage of water in the packed composition is 15% by weight, water equivalent to the remaining 35% by weight is added.

EXAMPLES

[Examples 1 to 3 and Comparative Example 1] Improvement of Feel during Use

[0086] A substrate was prepared by combining 65% by weight silica (Sipernat 2200, manufactured by Evonik Resource Efficiency GmbH) and 35% by weight cellulose (Vitacel L00, manufactured by J. Rettenmaier & Söhne GmbH). Then loading solutions were prepared by dissolving 50, 100, 10, and 90 mg of Na glutamate (MSG), γ -aminobutyric acid (GABA), arginine (Arg), and tripotassium phosphate (TPP), respectively, in 100 ml of distilled water. Samples were prepared by adding each of these aqueous solutions to the substrate to achieve predetermined percentages. Appropriate amounts of water, however, were added to the aqueous solutions so that the water content of each aqueous solution would be 44% by weight. The chemical makeups of the samples are presented in Table 2. It was found that the pH of the composition can be adjusted to a preferred range using Arg.

[Table 2]

		Table 2 Chemical Makeups			
		Comparative Example 1	Example 1	Example 2	Example 3
Substrate	% by weight	55.0	51.4	48.5	51.7
MSG	% by weight		2.2	2.0	
GABA	% by weight			2.0	2.2
Arg	% by weight		2.2	2.0	0.5
TPP	% by weight	0.8			
Water	% by weight	44.2	44.3	45.4	45.6
Water content	%	44.4	44.9	43.7	44.5
pH	-	7.7	8.5	8.5	7.9

[0087] Oral products were produced by packing the above samples into pouches according to the conventional method, and sensory tests were conducted as follows. The results are presented in Table 3.

Sufficiently trained panelists: Seven
Amount of sample: 0.7 g/pouch

Evaluation method: The panelists placed the pouch in their oral cavity and evaluated its mouthfeel for up to 60 seconds using the three grades of A to C. Feel during use derived from the texture of the oral product itself, such as the roughness of particles and the stiffness of nonwoven fabric, was excluded from the evaluation.

[0088] When replacing the pouch, the panelists were given a 3-minute interval and allowed to take water to lightly moisten their oral cavity.

[Table 3]

Table 3 Sensory Evaluation Results (n - 7; P1 to P7, individual raw data)						
Sample	Comparative Example	Example 1	Example 2	Example 3	Grade	Grading criteria
Overall grade	C	B	B	B	A	Better feel during use than B
P1	C	B	A	B		
P2	C	B	B	B	B	Good feel during use compared to C
P3	C	B	B	B		
P4	C	B	B	B	C	A strong stiff and dry sensation leads to an unfavorable mouthfeel
P5	C	B	B	B		
P6	C	B	B	B		
P7	C	B	B	B		

[0089] As shown in the table, it is clear that with the samples prepared in the Examples, the users are unlikely to feel a sensation of dryness. From the panelists, comments such as the following were obtained: in the Examples, no absorption of saliva into the product was felt; when comparing the Examples and the Comparative Example, the feel during use in the Examples was improved; and no difference in the sensation of moistness between the Examples was noticeable.

[Experimental Example] Deliquescence

[0090] To elucidate the deliquescence of amino acids, the water adsorption isotherm was measured for amino acids and an amino acid salt (MSG, GABA, and Arg) and trisodium phosphate (TSP). For the measurement, MicrotracBEL (MicrotracBEL Corporation) BELSORP MAX III was used. As a pretreatment of samples, the samples were vacuum-dried at 105°C until the leakage was 1 Pa/min or less.

The measurement conditions were set as follows.

[0091] At relative pressures (humidity levels) from 0.025 to 0.3: measurements are taken at relative pressure intervals of 0.025

[0092] At relative pressures (humidity levels) beyond 0.3 to 0.95: measurements are taken at relative pressure intervals of 0.05

[0093] After reaching a relative pressure of 0.95: measurements are taken at equal relative pressure intervals until a relative pressure of 0.1 (For TSP, however, the relative pressure limit was set to approximately 0.5 because measurement accuracy is reduced due to a prolonged measurement time.)

[0094] The equilibration conditions were that at relative pressures of 0.9 or lower, pressure changes should be 0.3% or smaller variations over 300 sec, and that at relative pressures of 0.9 or higher, pressure changes should be 0.3 Pa, as a pressure value, or smaller variations over 300 sec.

[0095] The water adsorption isotherms and desorption isotherms obtained are presented in Fig. 1. From this figure, it can be seen that for MSG, GABA, and TSP, the water content increases in the high-relative-pressure region, and the substance captures 100% d.b. or more water at relative pressures of 0.9 or higher.

[0096] The images of the samples after the end of the measurement are presented in Fig. 2. From this figure, it can be seen that for MSG and GABA, a solid has undergone a phase change and transitioned to a transparent liquid state. This state had already been observed in the state of the samples that reached adsorption equilibrium at a relative pressure of 0.95.

[0097] Changes in the samples between before and after the measurement of the adsorption and desorption isotherms were measured using Konica Minolta, Inc.'s spectrophotometer (CM-5). The measurement conditions were reflection

measurement and the SCI method, and the measurements were taken with the observation window of a 3-mm ϕ target mask covered with the glass container after the adsorption and desorption measurement. A blank tube, with no sample placed in it, was also subjected to the measurement, through which a measurement in a transparent state was determined. The results are presented in Table 4. The measurements are converted values for a 10° field of view and a D65 light source.

[Table 4]

Table 4 Spectrocolorimeter Measurements				
		L* (D65)	a* (D65)	b* (D65)
Before adsorption and desorption measurement	MSG	84.8	-0.2	1.1
	GABA	87.1	-0.1	1.5
	Arg	99.0	-0.1	0.4
	TSP	98.5	0.0	0.5
After adsorption and desorption measurement	MSG	33.7	-0.1	-0.2
	GABA	26.5	-0.3	-0.9
	Arg	94.8	-0.2	0.1
	TSP	92.4	-0.1	0.1
9 days after adsorption and desorption measurement	Glu	53.6	-0.7	-1.7
	GABA	33.1	-0.3	-0.9
A blank tube (note)		33.0	-0.2	-0.5

[0098] It was found that since the tubes are glass objects having curvature, the L* measurement is limited, with L* = 33 being the minimum. For MSG and GABA, the sample exhibited a white color and opacity, similar to Arg and the phosphate, before the adsorption and desorption equilibrium measurement. After deliquescence following the adsorption and desorption equilibrium measurement, however, the L* measurement greatly decreased, and the sample had a degree of transparency similar to that of the blank tube as shown in the figure. When the tubes were tightly closed and stored for 9 days at normal temperature after the adsorption and desorption equilibrium measurement, furthermore, the sample with GABA maintained the degree of transparency after the adsorption and desorption equilibrium measurement even following 9 days of storage. In terms of physical appearance, the sample was present stably in the liquid state after the phase change. As for MSG, the L* measurement increased over the 9 days of storage, and the sample became a whitened film form in terms of physical appearance. From the foregoing, it is clear that MSG and GABA have deliquescence. In the Examples, it was revealed that the samples made using MSG and GABA achieved an improved feel during use. The inventors attributed this phenomenon to the MSG or GABA contained in the composition deliquescing and undergoing a rapid phase change from solid to liquid upon contact with saliva and water in the oral cavity. The resulting liquid covers the surface of the product, thereby limiting abrupt movement of saliva into the substrate component.

[0099] Aspects will be presented below.

Aspect 1

[0100] An oral pouch product including a composition that contains:

- (A) an amino acid or a salt thereof; and
- (B) nicotine.

Aspect 2

[0101] The oral pouch product according to aspect 1, wherein the component (A) has deliquescence.

Aspect 3

[0102] The oral pouch product according to aspect 2, wherein the component (A) is selected from the group consisting of glutamic acid, γ -aminobutyric acid, salts thereof, and combinations thereof.

Aspect 4

[0103] The oral pouch product according to aspect 1, wherein the component (A) is a basic amino acid.

Aspect 5

[0104] The oral pouch product according to aspect 4, wherein the component (A) is selected from the group consisting of arginine, lysine, and a combination thereof.

Aspect 6

[0105] The oral pouch product according to aspect 1, wherein the composition contains, as the component (A):

a component selected from the group consisting of glutamic acid, γ -aminobutyric acid, salts thereof, and combinations thereof (A1), and

a component selected from the group consisting of arginine, lysine, salts thereof, and combinations thereof (A2).

Aspect 7

[0106] The oral pouch product according to any of aspects 1 to 6, wherein in the composition, 1% to 10% by weight of the component (A) is contained on a dry weight basis.

Claims

1. An oral pouch product comprising a composition that contains:

(A) an amino acid or a salt thereof; and

(B) nicotine.

2. The oral pouch product according to claim 1, wherein the component (A) has deliquescence.

3. The oral pouch product according to claim 2, wherein the component (A) is selected from the group consisting of glutamic acid, γ -aminobutyric acid, salts thereof, and combinations thereof.

4. The oral pouch product according to claim 1, wherein the component (A) is a basic amino acid.

5. The oral pouch product according to claim 4, wherein the component (A) is selected from the group consisting of arginine, lysine, and a combination thereof.

6. The oral pouch product according to claim 1, wherein the composition contains, as the component (A):

an ingredient selected from the group consisting of glutamic acid, γ -aminobutyric acid, salts thereof, and combinations thereof (A1), and

an ingredient selected from the group consisting of arginine, lysine, salts thereof, and combinations thereof (A2).

7. The oral pouch product according to any of claims 1 to 6, wherein in the composition, 1% to 15% by weight of the component (A) is contained on a dry weight basis.

Fig. 1

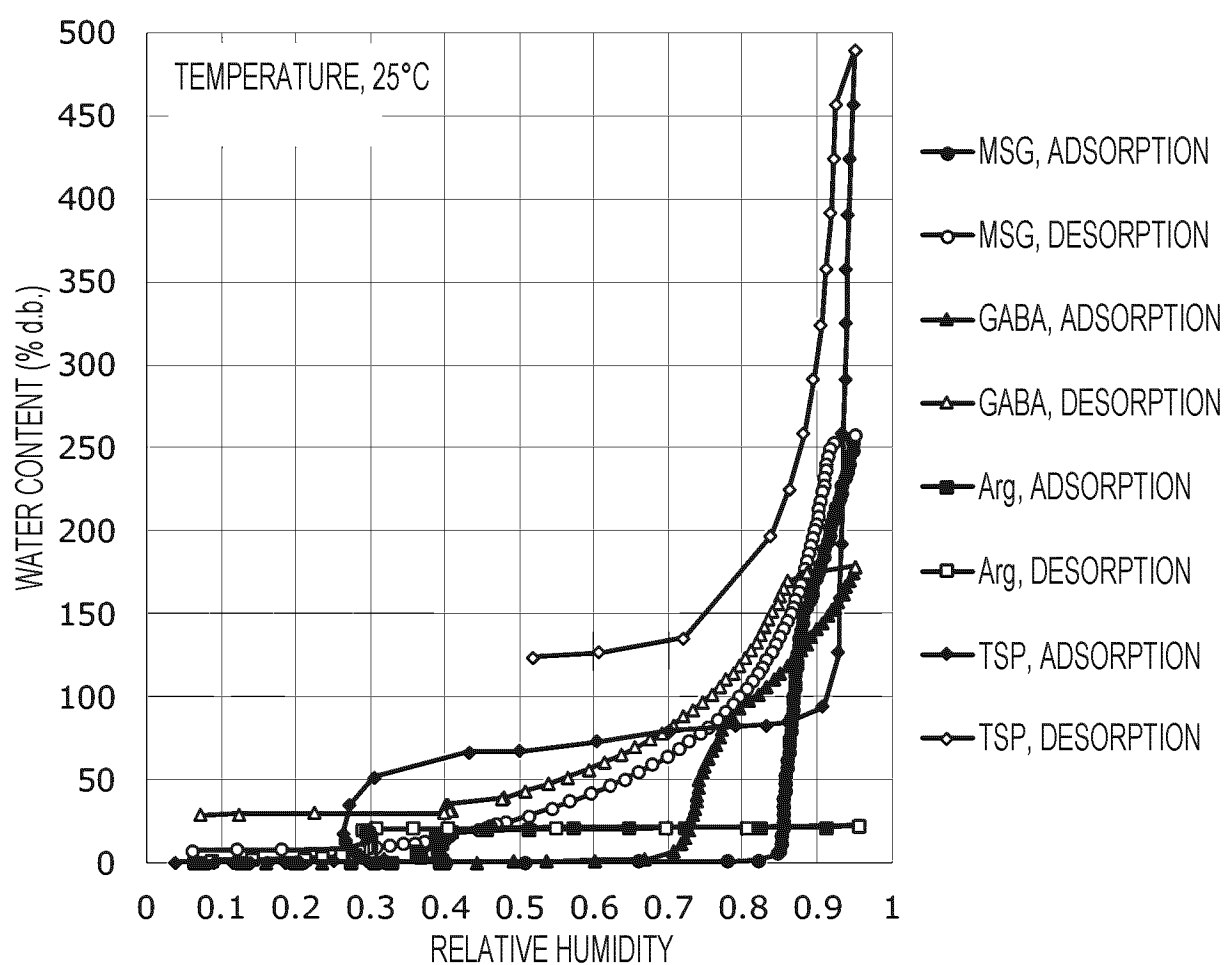
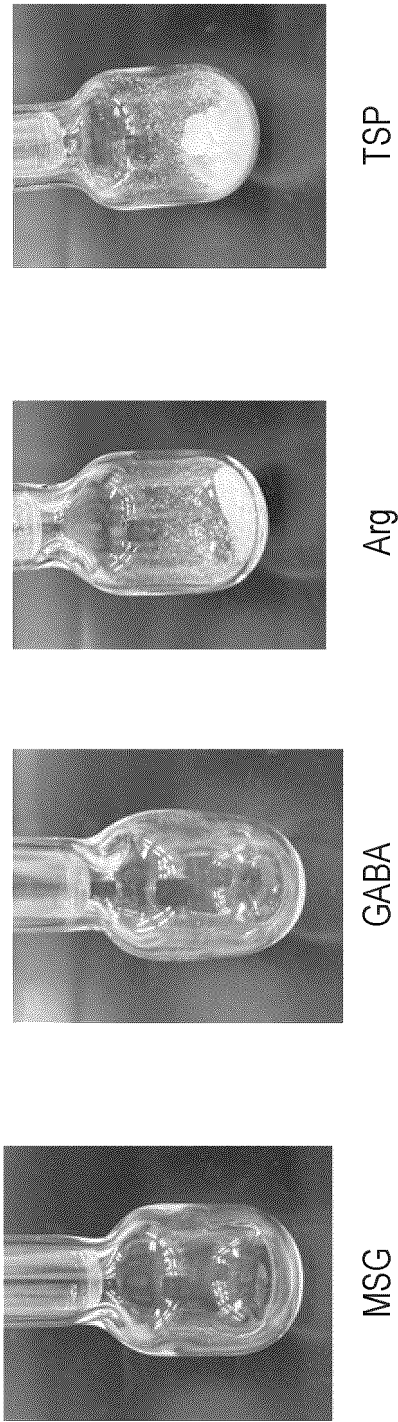


Fig. 2



INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2022/033528

A. CLASSIFICATION OF SUBJECT MATTER

A24B 13/00(2006.01)i

FI: A24B13/00

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A24B13/00

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

Published examined utility model applications of Japan 1922-1996

Published unexamined utility model applications of Japan 1971-2022

Registered utility model specifications of Japan 1996-2022

Published registered utility model applications of Japan 1994-2022

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2021/0378948 A1 (NICOVENTURES TRADING LIMITED) 09 December 2021 (2021-12-09) paragraphs [0129], [0136], [0137], [0196], [0204]	1-7

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

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

29 September 2022

Date of mailing of the international search report

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Japan

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/JP2022/033528

5	Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
10	US 2021/0378948 A1	09 December 2021	WO 2021/250516 A1	
15				
20				
25				
30				
35				
40				
45				
50				
55				

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- WO 2012133365 A [0003]
- JP 2010526875 PCT [0003] [0023]