

LIQUID COMPOSITION WITH EXCELLENT HEAT STABILITY

BACKGROUND OF THE DISCLOSURE

Field of the Disclosure

Disclosed is a liquid composition with excellent heat stability.

Description of the Related Art

In the normal case of preparing a food composition in a liquid formulation, the raw materials, which are important to be well dissolved in water, are first mixed and dissolved well. Then, other water-soluble liquid raw materials such as acidulants, sweeteners, and concentrates are added thereto, and, in order to secure microbial stability, ultra-high temperature (UHT) sterilization is carried out for several seconds under the temperature condition of 100°C or higher.

However, when the liquid natural scent is used for the customer's relaxedness, after the UHT treatment, the product's scent changes due to the low heat stability of the natural scent. In addition, when amino acids and reducing sugars are contained, heat treatment under a condition of high temperature changes the product scent due to the increase in unusual odors such as burnt taste and nutty flavor. It is thus necessary to develop a technology capable of minimizing the change in the emotional quality of the liquid product applied the natural scent including amino acids and reducing sugars.

Citation List

Patent Literature

Patent Literature 1: Korean Patent Publication No. 10-2003-0091593 A

SUMMARY OF THE INVENTION

In one aspect, the present disclosure aims to provide a heat stabilizer composition for ensuring the heat stability of a liquid composition comprising an amino group-containing material and a reducing sugar, or a liquid composition comprising an amino group-containing material, a reducing sugar and a natural scent material.

In another aspect, the present disclosure aims to provide a liquid composition with secured heat stability.

In still another aspect, the present disclosure aims to provide a method for producing the liquid composition.

In an aspect, the technology disclosed herein provides a heat stabilizer composition, in which the heat stabilizer composition comprises a gum as an active ingredient, and in which the heat stabilizer composition is to enhance the heat stability of a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar.

In an exemplary embodiment, a polyphenol may be further included as an active ingredient.

In an exemplary embodiment, the liquid composition may comprise c) a natural scent material.

In an exemplary embodiment, the gum may comprise one or more selected from the group consisting of arabic gum, carrageenan gum, locust bean gum, guar gum, gellan gum, xanthan gum, and alginate gum.

In an exemplary embodiment, the gum may comprise one or more of gellan gum and xanthan gum.

In an exemplary embodiment, the gellan gum may be one mixed with trisodium citrate and calcium lactate.

In an exemplary embodiment, the heat stabilizer composition may reduce cooked flavor of the liquid composition.

In an aspect, the technology disclosed herein provides a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide, and a protein; and b) a reducing sugar, wherein the liquid composition comprises the heat stabilizer composition.

In an exemplary embodiment, the liquid composition may comprise 500 parts by weight to 1,000 parts by weight of the reducing sugar and 0.1 parts by weight to 5 parts by weight of the gum with respect to 100 parts by weight of the amino group-containing material.

In an exemplary embodiment, the liquid composition may comprise 10 parts by weight to 100 parts by weight of the polyphenol with respect to 100 parts by weight of the amino group-containing material.

In an exemplary embodiment, the liquid composition may be ultra-high temperature (UHT)-sterilized.

In an exemplary embodiment, the liquid composition may be formulated as a liquid, suspension, drop, syrup or ampoule.

In an aspect, the technology disclosed herein provides a method of producing the liquid composition, in which the method comprises the steps of: adding a gum and first-stirring; adding one or more amino group-containing material of an amino acid, a peptide and a protein to the first-stirred mixture and second-stirring; and adding a reducing sugar to the second-stirred mixture and third-stirring.

In an exemplary embodiment, the second-stirring may be performed by adding the amino group-containing material and polyphenol to the first-stirred mixture.

In an exemplary embodiment, the method may comprise the step of adding a natural scent material to the third-stirred mixture and fourth-stirring.

In an exemplary embodiment, the method may comprise the step of ultra-high temperature (UHT)-sterilizing.

In an exemplary embodiment, the step of ultra-high temperature (UHT)-sterilizing may be performed at a temperature of 100°C or more for 3 seconds to 30 seconds.

In an aspect, the technology disclosed herein has an effect of providing a heat stabilizer composition for securing heat stability of a liquid composition comprising amino group-containing materials and reducing sugars, or a liquid composition comprising amino group-containing materials, reducing sugars and natural scent materials.

In another aspect, the technology disclosed herein has the effect of providing a liquid composition with secured heat stability. The liquid composition has a scent trapping ability so as to increase the scent persistence and to minimize the reaction between the raw materials at a high temperature, thereby suppressing the scent change and exhibiting a high scent stability.

In another aspect, the technology disclosed herein has the effect of providing a method of producing the liquid composition.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a view of showing evaluation results of the intensity of lemony scent according to an experimental example of the present disclosure; and

FIG. 2 is a view of showing evaluation results of the intensity of unusual odors according to an experimental example of the present disclosure.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Hereinafter, the present disclosure is described in detail.

In an aspect, the technology disclosed herein provides a heat stabilizer composition, in which the heat stabilizer composition comprises a gum as an active ingredient, and in which the heat stabilizer composition is to increase and/or improve heat stability of a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar.

In an exemplary embodiment, a polyphenol may be further included as an active ingredient.

In another aspect, the technology disclosed herein provides a use of a gum for producing a heat stabilizer composition for increasing heat stability of a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar.

In another aspect, the technology disclosed herein provides a use of a gum for producing a heat stabilizer composition for improving heat stability of a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar.

In an exemplary embodiment, the gum may be used with polyphenol.

In another aspect, the technology disclosed herein provides a use of a gum and polyphenol for producing a heat stabilizer composition for increasing heat stability of a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar.

In another aspect, the technology disclosed herein provides a use of a gum and polyphenol for producing a heat stabilizer composition for improving the heat stability of a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar.

In another aspect, the technology disclosed herein provides a method of increasing and/or improving heat stability of a liquid composition, in which the method comprises the step of producing the liquid composition by adding a gum, and the liquid composition comprises a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar.

In an exemplary embodiment, the method may comprise the step of producing the liquid composition by adding gum and polyphenol.

In another aspect, the technology disclosed herein provides a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar, in which the liquid composition comprises the heat stabilizer composition.

In another aspect, the technology disclosed herein provides a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar, in which the liquid composition comprises a gum.

In another aspect, the technology disclosed herein provides a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and

b) a reducing sugar, in which the liquid composition comprises a gum and polyphenol.

In another aspect, the technology disclosed herein provides a liquid composition with increased and/or improved heat stability, in which the liquid composition comprises at least one amino group-containing material selected from the group consisting of an amino acid a peptide and a protein; a reducing sugar; and a gum.

In an exemplary embodiment, the liquid composition may further comprise a polyphenol.

In an exemplary embodiment, the liquid composition may comprise a natural scent material. The method of increasing and/or improving heat stability of the liquid composition and the heat stabilizer composition increase the scent stability of the natural scent with low heat stability.

The natural scent material is distinguished from the artificial scent material prepared by artificial synthesis and can be obtained by extracting, extruding and/or distilling from plants. The natural scent material may have a liquid formation.

In an exemplary embodiment, the natural scent material may be one or more selected from the group consisting of peach, eucalyptus, jasmine, lemon, orange, rose, lavender, rosemary, pine, banana, vanilla, caramel, coffee, hazelnut, chocolate, peppermint, and cinnamon.

The amino acid is an organic compound having both an amino group and a carboxyl group. The amino acid may comprise glycine, alanine, valine, leucine, isoleucine, threonine, serine, cysteine, cystine, methionine, aspartic acid, asparagine, glutamic acid, diotyrosine, lysine, arginine, histidine, phenylalanine, tyrosine, tryptophan, proline, oxyproline, derivatives thereof, and the like.

The peptide is a compound in which two or more amino acids are linked by peptide bonds, and for example, may be composed of 2 amino acids to 200 amino acids.

The protein is a polymer organic compound linked with a large number of amino acids, and may be obtained from natural microorganisms, animals or plants. The protein may comprise all active enzymes obtained through genetic modification, all inactive proteins, and derivatives, hydrolysates, and denatured products thereof. For example, the protein may comprise keratin, collagen, gelatin, plant proteins, or hydrolysates of these proteins, or derivatives thereof, and the like.

The reducing sugar refers to a saccharide that exhibits reducing power, and is a generic term for one having an aldehyde group or a ketone group of a sugar molecule present in a free or hemiacetal form. All monosaccharides are reducing sugars.

In an exemplary embodiment, the reducing sugar may comprise one or more selected from the group consisting of xylose, glucose, fructose, galactose, lactose, maltose, maltodextrin, xylitol, sorbitol, maltitol, lactitol and isomalt.

In an exemplary embodiment, the gum may comprise one or more selected from the group consisting of arabic gum, carrageenan gum, locust bean gum, guar gum, gellan gum, xanthan gum, and alginate gum.

In an exemplary embodiment, the gum may comprise one or more of gellan gum and xanthan gum.

In an exemplary embodiment, the gellan gum may be one mixed with trisodium citrate and calcium lactate.

The polyphenol refers to a polyhydric phenol having two or more hydroxyl groups in phenol which refers to a substance in which one of the hydrogens in the benzene ring (C_6H_6) is substituted with a hydroxyl group ($-OH$).

Many compounds having such a structure exist in nature. Catechins in green tea, chlorogenic acids in coffee, red and purple anthocyanin pigments of strawberries, eggplants, grapes, black beans, and red beans are all polyphenol compounds.

In an exemplary embodiment, the polyphenol may be green tea-derived polyphenol.

In an exemplary embodiment, the green tea polyphenol may comprise one or more selected from the group consisting of caffeine, epigallocatechin (EGC), epicatechin (EC), epigallocatechin gallate (EGCG), and epicatechin gallate (ECG).

In an exemplary embodiment, the green tea polyphenol may be a post-fermented tea extract containing green tea polyphenols. Herein, "post-fermentation" includes fermentation by a separate microorganism or a substance other than the enzyme present in the tea leaf, and the post-fermentation tea may be obtained by post-fermentation of green tea.

In an exemplary embodiment, the post-fermented tea extract may comprise one obtained by a general extraction method in the art, regardless of the extraction method, the extraction solvent, the extracted component or the form of the extract and also comprise fractions obtained by fractionating the extract with a specific solvent. The form of the extract may preferably be in liquid or powder form. The extraction or fractionation can be carried out using water, an organic solvent, or a mixed solvent thereof. The organic solvent may comprise alcohol, isopropanol, acetone, hexane, ethyl acetate, carbon dioxide, or a mixture of two or more thereof, but is not limited thereto, and may be extracted or fractionated at room temperature or under warming conditions where the active ingredient of green tea is not destroyed or

minimized. The alcohol may be a lower alcohol of C1 to C5. The number or methods of extraction or fractionation are not particularly limited, and for example, cold water brewing extraction, ultrasonic extraction, reflux cooling extraction, hot water extraction, and the like may be used. Preferably, the extraction or fractionation of the active ingredient is performed by cold water brewing or warming, followed by filtration to obtain post-fermented tea extract.

In an exemplary embodiment, the liquid composition may comprise 500 parts by weight to 1,000 parts by weight of the reducing sugar with respect to 100 parts by weight of the amino group-containing material. More specifically, the liquid composition may comprise 500 parts by weight or more, 600 parts by weight or more, 700 parts by weight or more, 800 parts by weight or more, or 900 parts by weight or more and 1,000 parts by weight or less, 900 parts by weight or less, 800 parts by weight or less, 700 parts by weight or less, or 600 parts by weight or less of the reducing sugar with respect to 100 parts by weight of the amino group-containing material.

In an exemplary embodiment, the liquid composition may comprise 0.1 parts by weight to 5 parts by weight of the gum with respect to 100 parts by weight of the amino group-containing material. More specifically, the liquid composition may comprise 0.1 parts by weight or more, 0.5 parts by weight or more, 1 parts by weight or more, 1.5 parts by weight or more, 2 parts by weight or more, 2.5 parts by weight or more, 3 parts by weight or more, 3.5 parts by weight or more, or 4 parts by weight or more and 5 parts by weight or less, 4.5 parts by weight or less, 4 parts by weight or less, 3.5 parts by weight or less, 3 parts by weight or less, 2.5 parts by weight or less, or 2 parts by weight or less of the gum with respect to 100

parts by weight of the amino group-containing material.

In an exemplary embodiment, the liquid composition may comprise 10 parts by weight to 100 parts by weight of the polyphenol with respect to 100 parts by weight of the amino group-containing material. More specifically, the liquid composition may comprise 10 parts by weight or more, 20 parts by weight or more, 30 parts by weight or more, 40 parts by weight or more, 50 parts by weight or more, 60 parts by weight or more, 70 parts by weight or more, or 80 parts by weight or more and 100 parts by weight or less, 90 parts by weight or less, 80 parts by weight or less, 70 parts by weight or less, 60 parts by weight or less, 50 parts by weight or less, 40 parts by weight or less, 30 parts by weight or less, or 20 parts by weight or less of the polyphenol with respect to 100 parts by weight of the amino group-containing material.

In an exemplary embodiment, the method of increasing and/or improving heat stability of the heat stabilizer composition and the liquid composition may reduce cooked flavor of the liquid composition.

In an exemplary embodiment, the liquid composition may be one having heat stability.

In an exemplary embodiment, the liquid composition may be one having a scent stability against heat.

In an exemplary embodiment, the heat stability may mean that when the heat treatment is performed at a temperature of 90°C or more or 100°C or more, scent of the composition is not changed, slightly changed, or improved due to a reduced unusual odor or cooked flavor.

In an exemplary embodiment, the liquid composition may be ultra-high temperature (UHT)-sterilized. The UHT sterilization is a sterilization treatment at a very high temperature for a short time, and the composition has excellent scent stability against high temperature even

during UHT treatment.

The liquid composition according to the present disclosure comprises the heat stabilizer composition comprising a gum and a polyphenol to minimize the reaction between the raw materials to suppress the occurrence of unusual odors such as burnt taste and has the effect of having a scent stability against high temperature. Natural scents are generally unstable to heat above 80°C. Particularly, lemon scent has very low heat stability. The liquid composition according to the present disclosure provides a high intensity of natural scents even at high temperature-treatment.

In an exemplary embodiment, the liquid composition may further comprise one or more additives selected from the group consisting of minerals, acidulants, preservatives, antifoams, dispersants, excipients, suspending agents, antioxidants, stabilizers, coloring agents and nutrition enhancers. Examples of the acidulant comprise citric acid, acetic acid, tartaric acid, malic acid, lactic acid, fumaric acid, phosphoric acid, salts thereof, and the like, but are not limited thereto.

In an exemplary embodiment, the liquid composition may be formulated as a liquid, suspension, drop, syrup or ampoule.

In an exemplary embodiment, the liquid composition may be a food composition or a health food composition.

In an exemplary embodiment, the liquid composition may be a beverage composition.

In another aspect, the technique disclosed herein provides a method of producing the liquid composition, in which the method comprises the steps of: adding a gum and first-stirring; adding one or more amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein to the first-stirred

mixture and second-stirring; and adding a reducing sugar to the second-stirred mixture and third-stirring.

In an exemplary embodiment, the second-stirring may be performed by adding the amino group-containing material and polyphenol to the first-stirred mixture.

In an exemplary embodiment, the method may comprise the step of adding a natural scent material to the third-stirred mixture and fourth-stirring.

In an exemplary embodiment, the steps of first-stirring, second-stirring, third-stirring and fourth-stirring may be carried out at 80°C to 90°C.

In an exemplary embodiment, the step of fourth-stirring may be performed by lowering the temperature of the third-stirred mixture to 60 to 70°C and then adding a natural scent material and stirring the mixture.

In an exemplary embodiment, the method may comprise the step of ultra-high temperature (UHT)-sterilizing.

In an exemplary embodiment, the method may comprise ultra-high temperature (UHT)-sterilizing the third-stirred mixture or fourth-stirred mixture.

In an exemplary embodiment, the step of ultra-high temperature (UHT)-sterilizing may be performed at a temperature of 100°C or more or 110°C to 140°C.

In an exemplary embodiment, the step of ultra-high temperature (UHT)-sterilizing may be performed for 3 seconds to 30 seconds.

Hereinafter, the present disclosure is described in more detail with reference to Examples. These Examples are only intended to illustrate the present disclosure, and it will be apparent to those skilled in the art that the scope of the present disclosure is not to be construed as limited by these Examples.

Preparation Example 1

0.005 to 0.01 g of gellan gum, 0.01 to 0.02 g of trisodium citrate and 0.05 to 0.1 g of calcium lactate were added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.) to prepare a heat stabilizer composition.

Preparation Example 2

0.005 to 0.01 g of gellan gum, 0.01 to 0.02 g of trisodium citrate and 0.05 to 0.1 g of calcium lactate were added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.), and then 0.5 g of green tea polyphenol was added and stirred for 10 minutes at 90°C to prepare a heat stabilizer composition.

Preparation Example 3

0.01 to 0.02 g of xanthan gum was added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.) to prepare a heat stabilizer composition.

Preparation Example 4

0.01 to 0.02 g of xanthan gum was added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.), and then 0.5g of green tea polyphenol was added and stirred for 10 minutes at 90°C to prepare a heat stabilizer composition.

Comparative Example 1

0.5 g of soy isoflavone, 1 g of arginine and 0.5 g of green tea polyphenol were added and stirred at 80°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.), and then 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener and 0.5 g of citric acid were added and stirred at 80°C for 30 minutes. The temperature

of the mixture was reduced to 60-65°C, and 0.2 g of vitamin C and 0.1 g of flavoring agent were added and stirred for 5 minutes to prepare a liquid composition.

Exemplary Example 1

0.005 to 0.01 g of gellan gum, 0.01 to 0.02 g of trisodium citrate and 0.05 to 0.1 g of calcium lactate were added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.), and 0.5 g of soy isoflavone and 1 g of arginine were added and stirred at 90°C for 10 minutes. Then, 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener and 0.5 g of citric acid were added and stirred at 80°C for 30 minutes. Then, the temperature of the mixture was reduced to 60-65°C, and 0.2 g of vitamin C and 0.1 g of flavoring agent were added and stirred for 5 minutes to prepare a liquid composition. Finally, the mixture was UHT-sterilized at 110°C for 10 seconds.

Exemplary Example 2

0.005 to 0.01 g of gellan gum, 0.01 to 0.02 g of trisodium citrate and 0.05 to 0.1 g of calcium lactate were added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.), and 0.5 g of soy isoflavone, 1 g of arginine and 0.5 g of green tea polyphenol were added and stirred at 90°C for 10 minutes. Then, 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener and 0.5 g of citric acid were added and stirred at 80°C for 30 minutes. Then, the temperature of the mixture was reduced to 60-65°C, and 0.2 g of vitamin C and 0.1 g of flavoring agent were added and was stirred for 5 minutes to prepare a liquid composition. Finally, the mixture was UHT-sterilized at

110°C for 10 seconds.

Exemplary Example 3

0.01 to 0.02 g of xanthan gum was added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.), and 0.5 g of soy isoflavone, 1 g of arginine and 0.5 g of green tea polyphenol were added and stirred at 90°C for 10 minutes. Then, 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener and 0.5 g of citric acid were added and stirred at 80°C for 30 minutes. Then, the temperature of the mixture was reduced to 60-65°C, and 0.2 g of vitamin C and 0.1 g of flavoring agent were added and stirred for 5 minutes to prepare a liquid composition. Finally, the mixture was UHT-sterilized at 110°C for 10 seconds.

Exemplary Example 4

0.5 g of soy isoflavone, 1 g of arginine and 0.5 g of green tea polyphenol were added and stirred at 80°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.). Then, 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener and 0.5 g of citric acid were added and stirred at 80°C for 30 minutes. Then, the temperature of the mixture was reduced to 60-65°C, and 0.2 g of vitamin C and 0.1 g of flavoring agent were added and stirred for 5 minutes to prepare a liquid composition. Finally, the mixture was UHT-sterilized at 110°C for 10 seconds.

Exemplary Example 5

0.1 to 0.2 g of guar gum was added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.), and 0.5 g of soy isoflavone, 1 g of

arginine and 0.5 g of green tea polyphenol were added and stirred at 90°C for 10 minutes. Then, 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener and 0.5 g of citric acid were added and stirred at 80°C for 30 minutes. Then, the temperature of the mixture was reduced to 60-65°C, and 0.2 g of vitamin C and 0.1 g of flavoring agent were added and stirred for 5 minutes to prepare a liquid composition. Finally, the mixture was UHT-sterilized at 110°C for 10 seconds.

Exemplary Example 6

0.1 to 0.2 g of soybean polysaccharide was added and stirred at 90°C for 10 minutes using a hotplate stirrer (RCT Basic, IKA Co., Ltd.), and 0.5 g of soy isoflavone, 1 g of arginine and 0.5 g of green tea polyphenol were added and stirred at 90°C for 10 minutes. Then, 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener and 0.5 g of citric acid were added and stirred at 80°C for 30 minutes. Then, the temperature of the mixture was reduced to 60-65°C, and 0.2 g of vitamin C and 0.1 g of flavoring agent were added and stirred for 5 minutes to prepare a liquid composition. Finally, the mixture was UHT-sterilized at 110°C for 10 seconds.

Experiment 1. Evaluation of lemony scent and unusual odor

Twenty-two consumers including women and men in their 30s to 50s evaluated the lemony scent and unusual odor intensity for each sample prepared above, and the result are shown in Tables 1 and 2 below. The intensity of lemony scent was evaluated on a 15-point scale from 1 (weak) to 15 (strong) according to lemon taste felt when ingested, and the results are shown Table 1 and FIG. 1.

The intensity of unusual odor was evaluated on a 15-point scale from 1 (weak) to 15 (strong) according to cooked flavor (e.g., burnt taste, nutty flavor, caramel flavor) generated during high temperature-heating process, and the results are shown Table 2 and FIG. 2. Mean values for each sample were compared and tested for significance by one-way ANOVA.

[Table 1]

	Comparative Example 1	Exemplary Example 1	Exemplary Example 2	Exemplary Example 3	Exemplary Example 4	Exemplary Example 5	Exemplary Example 6
gum	X	Gellan gum	Gellan gum	Xanthan gum	X	Guar gum	Soybean polysaccharides
UHT	X	0	0	0	0	0	0
polyphenol	0	X	0	0	0	0	0
n1	8	7	14	11	6	3	3
n2	10	8	13	12	8	7	6
n3	7	7	13	11	5	4	6
n4	7	7	8	8	5	5	4
n5	8	9	7	4	6	5	5
n6	9	7	11	9	9	3	7
n7	9	9	9	10	6	6	5
n8	9	9	12	12	5	4	4
n9	8	7	6	11	6	3	3
n10	8	6	11	8	3	3	6
n11	7	9	11	8	2	5	5
n12	10	6	12	11	9	8	6
n13	8	6	12	10	7	4	4
n14	9	9	13	10	9	4	4
n15	9	8	5	8	5	8	5
n16	10	6	8	6	7	5	7

n17	8	7	11	11	8	6	6
n18	12	5	3	8	8	6	2
n19	8	8	12	10	5	4	9
n20	10	5	13	11	8	9	9
n21	6	8	10	9	4	3	3
n22	8	10	10	10	5	5	7
Mean	8.545	7.409	10.182	9.455	6.182	5.000	5.273

[Table 2]

	Comparative Example 1	Exemplary Example 1	Exemplary Example 2	Exemplary Example 3	Exemplary Example 4	Exemplary Example 5	Exemplary Example 6
gum	X	Gellan gum	Gellan gum	Xanthan gum	X	Guar gum	Soybean polysaccharides
UHT	X	0	0	0	0	0	0
polyphenol	0	X	0	0	0	0	0
n1	8	7	11	7	10	12	11
n2	6	10	12	6	9	8	14
n3	4	7	8	7	10	13	9
n4	7	7	7	7	8	11	7
n5	3	7	5	3	3	7	9
n6	11	9	5	6	6	9	11
n7	12	8	13	7	13	10	7
n8	10	6	6	8	11	10	11

n9	8	8	12	7	11	9	8
n10	7	8	7	7	11	10	9
n11	6	11	7	7	9	8	7
n12	10	9	6	8	8	6	11
n13	14	11	5	6	9	10	7
n14	8	6	3	8	12	5	10
n15	5	6	5	7	5	7	10
n16	7	9	5	5	9	8	10
n17	8	9	6	8	10	5	8
n18	7	9	8	11	10	12	7
n19	7	8	7	7	10	10	9
n20	6	9	7	6	9	6	7
n21	6	12	5	5	7	9	9
n22	8	8	5	7	10	10	7
Mean	7.636	8.364	7.045	6.818	9.091	8.864	9.000

After the UHT sterilization treatment, the lemony scent intensity is decreased due to the low heat stability of the natural scent. In Exemplary Example 2 including gellan gum and polyphenol and Exemplary Example 3 including xanthan gum and polyphenol, the natural scent is well preserved even at a high temperature and shows higher lemony scent than before UHT treatment. In addition, after the UHT sterilization treatment, the cooked flavor and unusual odor such as the burnt smell are increased due to the reaction of the amino acid and the reducing sugar. In Exemplary Example 2 including gellan gum and polyphenol and Exemplary Example 3 including xanthan gum and polyphenol, unusual odor was decreased and the unusual taste and unusual odor intensity was not changed compared with before the UHT treatment. Therefore, it was confirmed that the heat stability was excellent. These effects were significantly excellent than when gum or polyphenol was used alone.

Formulation examples of the composition according to one aspect of the present disclosure are described below. However, it is also applicable in various other formulations, and the examples are intended to be illustrative only and not to limit the present disclosure.

[Formulation 1] Ampoule

0.005 to 0.01 g of gellan gum, 0.01 to 0.02 g of trisodium citrate, 0.05 to 0.1 g of calcium lactate, 0.5 g of soy isoflavone, 1 g of arginine, 0.5 g of green tea polyphenol, 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener, 0.5 g of citric acid, 0.2 g of vitamin C and 0.1 g of flavoring agent were stirred according to the method in Exemplary Example 1. 15 ml of purified water was added thereto, and the mixture was

filled into the ampoule bottle, followed by sterilization to prepare liquid ampoule.

[Formulation 2] Liquid (healthy drink)

0.005 to 0.01 g of gellan gum, 0.01 to 0.02 g of trisodium citrate, 0.05 to 0.1 g of calcium lactate, 0.5 g of soy isoflavone, 1 g of arginine, 0.5 g of green tea polyphenol, 5 g of indigestible maltodextrin, 2 g of concentrate and sweetener, 0.5 g of citric acid, 0.2 g of vitamin C and 0.1 g of flavoring agent were stirred according to the method in Exemplary Example 2. 85 ml of purified water was added thereto, and the mixture was filled into the drink bottle, followed by sterilization to prepare liquid.

As described above, specific portions of the present disclosure have been described in detail, and for those skilled in the art, it is obvious that such specific techniques are merely preferred embodiments, and thus the scope of the present disclosure is not limited thereto. Thus, the substantial scope of the present disclosure is defined by the appended claims and their equivalents.

What is claimed is:

1. A heat stabilizer composition, wherein the heat stabilizer composition comprises at least one of gellan gum and xanthan gum; and a polyphenol as an active ingredient, and

wherein the heat stabilizer composition is to increase heat stability of a liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar.

2. The heat stabilizer composition of claim 1, wherein the liquid composition comprises c) a natural scent material.

3. The heat stabilizer composition of claim 1, wherein the gellan gum is one mixed with trisodium citrate and calcium lactate.

4. The heat stabilizer composition of claim 1, wherein the heat stabilizer composition reduces cooked flavor of the liquid composition.

5. A liquid composition comprising a) at least one amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein; and b) a reducing sugar,

wherein the liquid composition comprises the heat stabilizer composition according to any one of claims 1 to 4.

6. The liquid composition of claim 5, wherein the liquid composition comprises 500 parts by weight to 1,000 parts by weight of the reducing sugar and 0.1 parts by weight to 5 parts by weight of the gum with respect to 100 parts by weight of the amino group-containing material.

7. The liquid composition of claim 5, wherein the liquid composition comprises 10 parts by weight to 100 parts by weight of the polyphenol with respect to 100 parts by weight of the amino group-containing material.

8. The liquid composition of claim 5, wherein the liquid composition is ultra-high temperature (UHT)-sterilized.

9. The liquid composition of claim 5, wherein the liquid composition is formulated as a liquid, suspension, drop, syrup or ampoule.

10. A method of producing the liquid composition of claim 5, the method comprising the steps of:

adding a gum and first-stirring;

adding one or more amino group-containing material selected from the group consisting of an amino acid, a peptide and a protein and a polyphenol to the first-stirred mixture and second-stirring; and

adding a reducing sugar to the second-stirred mixture and third-stirring.

11. The method of claim 10, comprising the step of adding a natural scent material to the third-stirred mixture and fourth-stirring.

12. The method of claim 10, comprising the step of ultra-high temperature (UHT)-sterilizing.

13. The method of claim 12, wherein the step of ultra-high temperature (UHT)-sterilizing is performed at a temperature of 100°C or more for 3 seconds to 30 seconds.