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[54] **DETERGENT COMPOSITIONS**

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[58] **Field of Search** ..... 252/89, 99, 135, 136, 142; 260/234 R; 99/100, 103, 107, 154, 156, 157, 159, 222, 224

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[57] **ABSTRACT**

The detergent composition having a good detergency, a good transparency and the function of imparting a freshness preservation ability to food or the like comprises a sucrose ester component which comprises at least one sucrose ester of fatty acid having six to 22 carbon atoms, an organic acid component which is a member selected from the group consisting of malic acid, tartaric acid, alkaline salts of malic acid or tartaric acid and mixtures of the foregoing and preferably further includes an amino acid component and/or a saccharide component.

5 Claims, No Drawings

DETERGENT COMPOSITIONS

BACKGROUND OF THE INVENTION

This invention relates to new and improved detergents, and more particularly to new and improved detergents for food, tableware, containers for food and other articles relating to food.

Heretofore, detergents which are used in large quantities are those whose active component is alkylbenzensulfonate (hereinafter referred to as ABS) or petroleum type non-ionic surfactant.

However, the use of detergents whose active component is ABS salt, etc. not only causes a foam public hazard to social environment but also has adverse effects on the human skin. Further, it raises a problem about its adverse effects when said active component is absorbed in the human body as they penetrate into washed materials or migrate into underground water. Further, most of the materials to be washed are the so-called uncooked food including fish, vegetables, fruit and the like, which tend to undergo oxydization due to air, browning due to enzyme and bacteria, and discoloration due to acids. Such tendency becomes pronounced after washing treatment with detergents.

A new all-around detergent yet remains to be developed which not only avoids the foam public hazard and adverse effects on the human body but also prevents the browning and rotting of materials to be washed and positively preserves the freshness thereof.

An attempt was made, of example as disclosed in Japanese Patent Publication No. 20,553 of 1967, to prevent chapping by incorporating sucrose in ABS salt or aliphatic sulfate. This attempt do not, however, solve the problems including foam public hazard, adverse effects on the human body and discoloration and rotting of materials to be washed. Another attempt was made, in Japanese Patent Publication No. 23,072 of 1971, to provide a detergent for food and the like consisting of a sucrose ester of a fatty acid and citric acid or a salt thereof. This detergent composition did not prevent the discoloration and rotting of materials to be washed, nor did it preserve the freshness thereof. A further attempt in Japanese Patent Publication No. 29,185 of 1971 is directed to provide a freshness preservation treatment method, in which the freshness of fishes and shellfishes is preserved by immersing them in cooling water using an organic or inorganic acid salt with pH being adjusted to 7.8 - 9.0. The compounds used in this method for preserving the freshness of food do never satisfy other requirement for detergents for food.

On the other hand, a liquid detergent must have a stable or sustainable transparency or clearness so that it is free from cloudiness, solid-liquid separation, precipitation and other drawbacks. The is necessary from the standpoint not only of aesthetic value for goods but also of detergency which is the basic property.

The primary object of the invention is to provide a new and improved versatile detergent composition which has no danger of consisting of a foam public hazard and adversely affecting the human body.

Another object of the invention provide a new and improved detergent composition in which said composition has a transparency and its transparency is stable.

A further object of the invention is to provide a new and improved detergent composition which prevents the discoloration and rotting of food and the like to be washed and imparts a freshness preservation ability to those materials to be washed without sacrificing its detergency.

Other objects and advantages of the invention are partly apparent and partly will be described in detail hereinafter.

SUMMARY OF THE INVENTION

Fundamentally, the detergent composition comprises a mixture of a sucrose ester component with an organic acid component. The sucrose ester component comprises at least one sucrose ester of fatty acids. The organic acid component is a member selected from the group consisting of malic acid, tartaric acid, alkali salts of malic acid or tartaric acid and mixtures of the foregoing. Malic acid and alkali malates provide the detergent composition particularly with a stable transparency while tartaric acid and alkali tartrates are particularly effective to improve the freshness preservation ability.

The sucrose ester component may preferably comprise at least one sucrose ester of saturated or unsaturated fatty acid having six to 22 carbon atoms and the degree of sabstitution of said sucrose ester given by the average a value of the number of esterified fatty acid molecules per one sucrose molecule is within the range of 1.0 to 1.8. More preferably, the sucrose ester component comprises a sucrose ester of a mixed fatty acid, at least 70 percent by weight of said mixed fatty acid being fatty acid having 12 carbon atoms and the degree of substitution of said sucrose ester given by the average value of the number of esterified fatty acid molecules per one sucrose molecule being within the range of 1.23 to 1.57.

In order to further improve the detergency and the function of imparting the freshness preservation ability, the detergent composition according to the invention may further include an amino acid component which is selected from the group consisting of amino acids and alkali salts thereof. Typically, the amino acid component is a member selected from the group consisting of glutamic acid, alkali salts of glutamine acid, glycine, alkali salts of glycine and mixtures of the foregoing. In a preferred embodiment of the invention, detergent composition which can impart an improved freshness preservation ability to food or the like comprises 5 to 50 parts, more preferably, 10 to 35 parts by weight of the above mentioned sucrose ester component, 15 to 18 parts, more preferably, 30 to 70 parts by weight of sodium tartrate and 5 to 65 parts, more preferably, 10 to 42 parts by weight of sodium glutamate. It should be noted that these values indicate the composition ratios among various components

The detergent composition according to the invention, may further include a saccharide component. The addition of a saccharide component improves the detergency, the stable transparency and the function of imparting a freshness preservation ability. Preferably, the saccharide component is sucrose or sorbitol.

DETAILED EXPLANATION OF THE INVENTION

The sucrose ester of fatty acid (hereinafter referred to as "SE"), which is one of the essential components of the detergent composition according to the invention, can be a superior detergent component which is edible and which has biodegradivity, having no adverse effects on the human body. In some cases the utiliza-

tion of SE in the liquid detergent, however, reduces its detergency and the transparency stability in an aqueous solution. There is therefore a critical range for the SE which can be useful for the present invention.

Considered from the stability of SE in an aqueous solution, it is desirable to decrease as much as possible the number of carbon atoms in the constituent fatty acid of the SE and the substitution degree as well.

On the other hand, considered from the detergency of SE, it is necessary that the number of carbon atoms be 12 or more since 10 or less results in a great loss of detergency.

With sucrose esters of fatty acids having 12 or more carbon atoms, however, it is necessary from the standpoint of a good transparency sustainability to greatly decrease the substitution degree. This, however, involves much difficulties in production and is not desirable as it is not economical. Moreover, the increase of substitution degree results in a decrease in solvency which, in turn, results in a decrease in detergency.

Under the above circumstances, in a preferred embodiment of the invention, the sucrose ester component comprises a sucrose ester of a mixed fatty acid, at least 70 percent by weight of said mixed fatty acid being fatty acid having 12 carbon atoms and the degree of substitution of said sucrose ester given by the average value of the number of esterified fatty acid molecules per one sucrose molecule being within the range of 1.23 to 1.57.

Further, in the practical use of a liquid detergent, it should have a versatile detergency against various and stubborn stains. In many cases, even if the above specified SE is used, the detergency is still in sufficient so that it is necessary to incorporate a substance having a suitable builder effect. Among the substances used as builders there may be considered inorganic salts such as sodium tripolyphosphate, sodium metasilicate, potassium pirophosphate, sodium metaphosphate and sodium carbonate, organic acids such as tartaric acid, lactic acid, and citric acid, salts thereof, amino acids such as glutamic acid and glycine, and salts thereof.

Although these builders contribute to the improvement of detergency, there are detrimental to the sustainable transparency of the SE containing liquid detergents. We have found that malic acid and alkali salts thereof are superior as builders and unexpectedly maintain a good transparency in the SE containing liquid detergents. In addition, malic acid and alkali salts thereof are accepted as food additives and they have no danger of adversely effecting the human body as well as SE does not.

The effect that malic acid and alkali salts thereof unexpectedly maintain a good transparency of the SE-containing liquid detergents and contribute to sustain the transparency is believed owing to the intrinsic property of malic acid and alkali salts thereof, as can be summarized from the fact that they have remarkable miscibility as compared to inorganic acids, other organic acids than malic acid and salts thereof, and the fact that malic acid is decidedly superior in solvent-solubility to any other organic acids.

The liquid detergent according to the invention may preferably comprise 3 to 25 parts by weight of the above mentioned sucrose ester component, 3 to 45 percent by weight of malic acid or alkali salts thereof such as sodium malate and 30 to 94 parts by weight of water. With such mixing ratio, there is obtained a liquid detergent which has a good and a sustained transparency and a good detergency. Any other additives may be added to the liquid detergent composition so far as the above mentioned composition ratio among these components is maintained and there is no detraction from transparency and its stability therein. Preferably, the liquid detergent composition according to the invention is adjusted at a pH value within the range of 5.5 to 7.0.

To the detergent composition including the above mentioned SE component and malic acid or its alkali salt an amino acid or its alkali acid such as glutamic acid or sodium glutamate may be added in order to provide the detergent composition with the function of imparting a freshness preservation ability to food to be washed.

The above mentioned detergent composition having a good detergency and a sustained transparency may further include a saccharide component. The addition of a saccharide component is effective to improve the transparency and its sustainability of the detergent composition when dissolved in water and enables the detergent composition to be preserved for a long time. The detergency of the composition can also be preserved for a long time by the addition of a saccharide component. The reason why the addition of saccharide contributes to stabilize the transparency of the detergent composition is that at the same time as the saccharide is effective to increase viscosity, it undergoes hydrogen bonding with water molecules when dissolved in water as well as SE does the same and acts other medium for dissolving of SE in malic acid or alkali salts thereof to increase miscibility.

The saccharide component may comprise a member selected from monosaccharides, disaccharides, and their derivaties, especially sucrose and sorbitol.

The amount of the saccharide component in a liquid detergent composition may preferably be within the range 5 to 30 percent by weight of the liquid composition.

In some cases the crude reaction product in the production of SE includes unreacted sucrose. Such the crude reaction product including both SE and sucrose may be conveniently and economically used as the material for the detergent composition according to the invention, although the composition ratio must be adjusted so as to be within the beforementioned range.

In another embodiment of the invention tartaric acid or its alkali salt is used instead of or in addition to malic acid or its alkali salt an an amino acid component is further added to the detergent composition. This embodiment particularly provides a detergent component which has a good detergency and is effective to impart a good freshness preservation ability to the materials to be washed.

The reason why the combined use of the above three components in the detergent composition according to the invention can selectively achieve the preservation of the freshness of materials to be washed is not clear. It has, however, been found that the use of SE alone does not provide these merits and that the combined use of SE and tartaric acid or an alkali salts thereof or the combined use of SE and glutamic acid or an alkali salt thereof also fails to achieve these merits to the full. From these facts it is considered that the combined use of the above mentioned three components would effect penetration of some of those compliments into a mate-

rial to be washed and there would be caused some change, bond, etc., with respect to the discoloring and denaturing components existing on the surface or in the interior of said material, thereby preventing the action of the discoloring and denaturing components.

As to the sucrose ester component before described discussion can be repeated here. That is to say, the sucrose ester component may comprise at least one sucrose ester of saturated or unsaturated fatty acid having six to 22 carbon atoms and the degree of substitution of said sucrose ester given by the average value of the number of esterified fatty acid molecules per one sucrose molecule is within the range of 1.0 to 1.8. Preferably, the sucrose ester component comprises a sucrose ester of a mixed fatty acid, at least 70 percent by weight of said mixed fatty acid being fatty acid having 12 carbon atoms and the degree of substitution of said sucrose ester given by the average value of the number of esterified fatty acid molecules per one sucrose molecule being within the range of 1.23 to 1.57. This composition ration is particularly important to maintain a good transparency of the detergent composition.

The organic acid component of this embodiment is tartaric acid or any of alkali salts of tartaric acid. Among alkali salts of tartaric acid there are included sodium tartrate and potassium tartrate. Sodium tartrate is most preferable as it is accepted as a food additive.

The amino acid component of the above detergent composition may be selected from the group consisting of amino acids and alkali salts thereof. Typically, the amino acid component may be any of glutamic acid, alkali salts of glutamic acid, glycine, alkali salts of glycine and mixtures of foregoing. Among alkali salts of glutamic acid there are included sodium glutamate and potassium glutamate. Sodium glutamate is most preferred because it is accepted as a food additive.

The detergent composition which has the function of imparting a good freshness preservation ability to the materials to be washed may comprise 5 to 50 parts, preferably 10 to 35 parts by weight of the above mentioned sucrose ester component, 15 to 80 parts, preferably 30 to 70 parts by weight of tartaric acid or its alkali salt such as sodium tartrate and 5 to 65 parts, preferably 10 to 42 parts by weight of glutamic acid or its alkali salt such as sodium glutamate. It should be noted that these values indicate the composition ratio range among the essential components.

When the above detergent composition is used in the form of an aqueous solution, the system may preferably be adjusted at a pH value within the range of 5.5 to 7.5, most preferably, within the range of 6.0 to 7.0.

The above detergent composition which essentially comprises a sucrose ester component, an organic acid component and an amino acid component may further include any of additives such as oxalic acid, lactic acid, citric acid, malic acid, fumaric acid, ascorbic acid, polyphosphoric acid, sulfurous acid, lysine, glycine, cystein, aminobutyric acid, asparaginic acid and slats thereof, sodium bicarbonate, table salts, and sugars such as sucrose and sorbitol.

The addition of a saccharide is particularly preferred because it improves the freshness preservation capacity. It is considered that this would be owing to the fact that the saccharide component adheres to the material to be washed to form a coating layer thereon which in turn isolates the discoloring and yellowing components from air.

The saccharide component which may be sucrose or sorbitol may be included in an amount of 5 to 30 percent by weight with respect to the total amount of the detergent composition including the sucrose ester component, the organic acid component, the amino acid component and other additives.

The crude reaction product obtained in the production of SE usually includes unreacted sucrose. Such the crude reaction product including both SE and sucrose may be conveniently and economically used as the material for the detergent composition according to the invention, as already discussed before.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

For the better and complete understanding of this invention, typical examples thereof together with some comparative examples are shown in the following in which percentages and parts are indicated by weight:

EXAMPLE 1

A sucrose ester of a mixed fatty acid was prepared. The material mixed fatty acid consisted of 1.0% of C_6 fatty acid, 6.6% of C_8 fatty acid, 11.4% of C_{10} fatty acid, 77.3% of C_{12} fatty acid and 3.7 % of C_{14} or higher fatty acids. The substitution degree of the SE was 1.41 and the purity of the SE was 93.9 percent. Aqueous solutions of 0.25 and 0.5 percent of a mixture of an amount of the above SE with an equal amount of each of various builders shown in Table 1 were prepared. The detergency of each of the solutions was measured under the following conditions and by the following method:

Artificially soiled standard fabrics:	Fabrics soiled with cleaner dust (powdered dust of a home vacuum cleaner filtered by a 250 mesh screen) and extracted sebum (which was obtained by extraction of a solvent from a cotton underwear worn for 4 days)
Washing condition:	Room temperature (25±2°C), 15 minutes Terg-O-Tometer
Measurement of detergency:	Reflectivity of soiled fabric is measured before and after washing and the result is evaluated by the following formula
Percentage washing:	

$$\text{Percentage washing:} = \frac{(\text{reflectivity of soiled fabric after washing}) - (\text{reflectivity of soiled fabric})}{(\text{reflectivity of original fabric}) - (\text{reflectivity of soiled fabric})} \times 100\,(\%)$$

The results are shown in Table 1.

Table 1

Kind of builders	Percentage Detergency 0.5 % solution	0.25 % solution
None	30	23
sodium malate	72	68
sodium tripolyphosphate	63	53
sodium metasilicate	40	36
sodium citrate	65	57
sodium tartrate	63	55
sodium gluconate	55	41
sodium glutamate	51	43
glycine	40	32

From Table 1, it will be observed that among the combinations of the specified SE with various builders, the combination of the SE with sodium malate is best in detergency and the combination of the SE with sodium tartrate is also good in detergency and of the substantially same rank as the combination of the SE with sodium tripolyphosphate.

EXAMPLE 2

Using SE's indicated at A – F in Table 2–1 comprising the proportions of the numbers of carbon atoms of the respective constituent fatty acids shown in Table 2–1, and selecting SE's in the ranges of substitution degrees shown in Table 2–2, aqueous solutions of 10 percent of the respective SE's were prepared and the transparency or clearness of the solutions after 5 hours of standing at 25°C was observed. The results are shown in Table 2—2.

Table 2-1

sample reference character / Number of carbon atoms in constituent fatty acid	A	B	C	D	E	F
6	7		1.0			
8	92		6.6	6.9		
10	1	5	11.4	6.1		
12		92	77.3	55.3	8	0.4
14		3	3.7	16.7	92	3.5
16				7.6		27.3
18				7.4		68.7
20						1.1

Notes: The numerical values in the above table are shown by the weight percentage of the residue of the fatty acids with the respective numbers of carbon atoms.

Table 2-2

Degree of substitution / Sample Reference character	1.27–1.31	1.39–1.43	1.48–1.52	1.59–1.64	1.74–1.81
A	transparent	transparent	transparent	transparent	cloudy
B	do.	do.	do.	cloudy	do.
C	do.	do.	do.	do.	do.
D	do.	do.	cloudy	do.	do.
E	do.	cloudy	do.	do.	do.
F	cloudy	do.	do.	dispersed	dispersed

In the above table, "transparent" indicates those which were observed with naked eyes as transparent after 48 hours, "cloudy" indicates those which were observed with naked eyes as to have some clouds after 48 hours and "dispersed" indicates those which were observed with naked eyes as milky and/or precipitated after 48 hours.

From Tables 2–1 and 2–2, it will be observed that if the SE used is a sucrose ester of a mixed fatty acid, 77.3 percent of which is a fatty acid having 12 carbon atoms, the substitution degree of the SE must be 1.52 or less for securing a good and sustained transparency. After a further experimentation it has been ascertained that if 70 percent of the mixed fatty acid is a fatty acid having 12 carbon atoms, the substitution degree of the SE enough to obtain a good and stable transparency must be 1.57 or less.

EXAMPLE 3

Some different SE's having different compositions and different substitution degrees as shown in Table 3 were prepared and then 10 ml solutions of such SE's were prepared. To each of those solutions was added n-hexane. The degrees of cloudiness of the solutions dependent on the amount of n-hexane added were measured by a spectrophotometer in terms of –log T. The results are shown in Table 3.

Table 3

Aqueous Solution of SE		Degree of Cloudiness (in -log T)					
		Amount of n-hexane added (μl)					
SE Composition	Degree of substitution	20	30	40	50	60	70
monostearic acid ester	1.00	0.05	0.05	0.21	0.48	0.72	0.93
monostearic acid ester: 3 parts dipalmitic acid ester: 1 part	1.25	do.	0.06	0.06	0.14	0.32	0.41
monostearic acid ester: 3 parts dipalmitic acid ester: 1 part	1.33	do.	do.	0.07	0.05	0.23	0.32

From Table 3, it will be observed that when the degree of substitution of SE is much less than 1.25, the solvency is decreased, contrary to expectation.

EXAMPLE 4

Solutions of mixtures in various mixing rates of the same SE as in Example 1 with sodium malate were prepared and the transparency of the solutions at 30°C was observed. The results are shown in Table 4.

From Table 4, it will be observed that transparency or clearness can be maintained when the concentration of the SE is 20 percent or less and that of sodium ma-

Table 4

SE Concentration (%) / Concentration of sodium malate (%)	0	10	20	30	40
0	transparent	transparent	transparent	cloudy	cloudy
5	do.	do.	do.	do.	do.
10	do.	do.	do.	do.	do.
20	do.	do.	do.	do.	do.
30	do.	do.	do.	do.	precipitated
35	do.	do.	do.	do.	do.
40	do.	do.	do.	precipitated	do.
50	separated	separated	cloudy	do.	do.
60	do.	do.	separated	separated	separated

late is 40 percent or less. After a further experimentation, it has been ascertained that if the concentration of the SE is 25 percent and that of sodium malate is 45 percent or less, a good and sustained transparency can be maintained.

In addition, the detergency of solution of 0.25 percent of each of various compositions of the SE and sodium malate shown in Table 4 was measured by the same detergency tester as in Example 1, and it has been found that when the SE and malic acid are both 3 percent or less, the percentage detergency is greatly decreased.

EXAMPLE 5

Aqueous solutions consisting of 15 g of the same SE as Example 1, 15 percent of various chemicals shown in Table 5 and 70 g of water were prepared, with the pH thereof adjusted to 6.5±2, and the transparency thereof at room temperature was observed. The results are shown in Table 5.

Table 5

When observed chemicals added	After preparation	After 24 hours (standing at room temperature)
None	transparent	transparent
sodium malate	do.	do.
sodium tripoly-phosphate	precipitated	precipitated
sodium metasilicate	do.	do.
sodium citrate	very cloudy	do.
sodium tartrate	transparent	cloudy
sodium gluconate	cloudy	do.
sodium glutamate	transparent	do.
glycine	cloudy	do.

From Table 5, it will be observed that when sodium malate is used in combination with the particular SE, the solution is transparent and superior in its sustained stability.

EXAMPLE 6

Aqueous solutions consisting of 15g of the same SE as in Example 1, 15 g of sodium malate and 70 g of water were prepared, with their pH values adjusted to 5.0, 6.0, 7.0 and 8.0, respectively, at 30°C and the temperatures at which the respective solutions become cloudy when cooled at the rate of 1°C/min, were measured.

Further, similar measurements were made of said pH-adjusted solutions after 3-month standing. The results are shown in Table 6.

Table 6

pH	Temperature at which cloudiness begins to take place (°C): After adjustment of pH	After 3-month standing
5.0	20	22
6.0	11	12
7.0	9	14
8.0	6	precipitated during standing

From Table 6, it will be observed that a solution of SE and sodium malate is superior in transparency and its sustained stability when its pH is adjusted to 6.0 – 7.0. After a further experimentation it has been ascertained that if the pH is adjusted within the range of 5.5 to 7.0 a good transparency and its sustained stability is secured.

EXAMPLE 7

Various additives shown in Table 7 were added to 100 g of aqueous solutions of the same SE as Example 1. The transparency of the solutions, after 30 to 180 day standing, was measured. The results are shown in Table 7.

Table 7

Additive	Amount added(g)	Conditions of solution: 30 days	60 days	120 days	180 days
sodium malate	30	TP	TP	WC	WC
sodium malate sucrose	30 15	TP	TP	TP	TP
sodium malate sorbitol	30 15	TP	TP	TP	TP
sodium malate ethanol	30 15	TP	TP	C	P

Notes:
TP : Transparent
WC : Slightly cloudy
C : Cloudy throughout
P : Precipitation and separation

From Table 7, it will be observed that the addition of a saccharide ensures that the transparency or clearness of the solution is sustained for a long time. In addition it has been ascertained that when the amount of the saccharide component added is 5 percent or less there was no good merit and that with the saccharide component in the amount of more than 30 percent, no further improvement in transparency could be appreciated.

EXAMPLE 8

Liquid detergents consisting of 15 percent of the same SE as in Example 1, 20 percent of sodium malate,

18 percent of sorbitol and 50 percent of water were used for the dish washing test according to the so-called "Shell Method" with a concentration of 0.25 percent and at ordinary temperature.

The numbers of dishes that could be washed were as follows:

Table 8

Detergent	Number of dishes washed	
	Solid with tallow	Solid with mayonnaise
Present inventive article	17	23
SE alone *)	5	7
SE + sodium tripolyphosphate **)	12	17
ABS type neutral detergent commercially available in the tradename of "ALCO-L" from Nippon Sunhome Co., Ltd.	20	25

Notes:
*) "SE alone" means the present inventive article less sodium malate and sorbitol

**) Sodium tripolyphosphate is a substitution for sodium malate of the present inventive article.

From Table 8, it will be observed that the detergency of the present inventive liquid detergent is almomst equal to that of the conventional ABS type detergent.

EXAMPLE 9

A large number of similar leaves of a fresh cabbage were taken. Three of such leaves were immersed in each of the aqueous solutions of 2 percent of respective samples (the pH being adjusted to 7.0) shown in Table 1 and were lightly washed therein for three minutes. After washing, they were lightly rinsed with city water and allowed to stand.

The freshness evaluation tests were made of them after 3, 7, 12 and 24 hours, respectively. The results are shown in Table 9. Freshness Evaluation:

With randomly selected 20 panelists consisting of 10 men and 10 women, visual inspection was made and indicated in Table 9 with the following criteria.

The number of persons who perceived freshness decrease and discoloration	Evaluation
0 - 3	0
3 - 5	+
5 - 10	++
10<	+++

From Table 9, it will be observed that a mixture of three components, SE, tartaric acid and sodium glutamate has the most superior freshness preservation capability.

EXAMPLE 10

Samples consisting of the SE-(B) shown in Table 9, sodium tartrate and sodium glutamate were prepared with the ratios shown in Table 10, and with the other methods and conditions being maintained unchanged, evaluation tests were made. The results are shown in Table 10.

Table 9

Test Sample	Freshness evaluation			
	After 3 hours	After 7 hours	After 12 hours	After 24 hours
cooled and stored immediately after washing with water	0	0	0	+
water alone	+	++	+++	+++
SE-(A)*)	0	+	++	+++
SE-(B)**)	+	++	+++	+++
do. + sodium citrate***)	0	+	++	+++
do. + sodium malate ***)	0	+	++	+++
do. + sodium tartrate ***)	0	+	++	+++
do. + glycine ***)	+	++	+++	+++
do. + glutamic acid***)	+	++	+++	+++
do. + sodium glutamate ***)	0	+	++	+++
do. + sodium tripolyphosphate***)	+	++	+++	+++
do. + sodium tartrate + sodium glutamate ***)	0	0	0	+
SE-(B) +sodium citrate+sodium glutamate ****)	0	+	+	++
SE-(B) + sodium tartrate + sodium tripolyphosphate	0	+	++	+++
SE-(B) + sodium tartrate + sodium malate	0	+	+	+++

Note: *) SE-(A): constituent fatty acid

C_{12}	0.4%
C_{14}	3.5%
C_{16}	26.3%
C_{18}	68.7%
C_{20}	1.1%

Degree of substitution: 1.35

**) SE-(B): constituent fatty acid

C_{10}	5%
C_{12}	92%
C_{14}	3%

Degree of substitution: 1.37

***) Mixing ratio between two:
SE-(B): each of Additives = 1 : 2

****) Mixing ratio between three:
SE-(B): 1st Additive : 2nd Additive = 1 : 1 : 1

Table 10

Test Sample			Freshness Evaluation
SE-(B) (%)	Sodium Tartrate (%)	Sodium Glutamate (%)	After 12 hours
70	20	10	++
60	10	30	++
50	10	40	++
50	40	10	+
40	30	30	+
30	50	20	0
30	30	40	0
30	20	50	+
20	70	10	0
20	40	40	0
20	20	60	+
10	80	10	+
10	60	30	0
10	40	50	+
10	10	80	++

From the data shown Table 10 and after a further experimentation it has been found that superior freshness capability is achieved when the mixing ratio among SE, sodium tartrate and sodium glutamate is such that SE is 5 – 50 percent particularly 10 – 35 percent, sodium tartrate is 15 – 80 percent, particularly 30 – 70 percent, and sodium glutamate is 5 – 65 percent, particularly 10 – 42 percent.

EXAMPLE 11

Samples consisting of the SE-(B) shown in Table 9, sodium malate and sodium glutamate were prepared with the composition ratio shown in Table 11, and with other methods and conditions being maintained unchanged, evaluation tests were made. The results are shown in Table 11.

Table 11

uz,1/32 Test Sample			Freshness Evaluation after 12 hours
SE-(B)(%)	Sodium malate(%)	Sodium glutamate (%)	
30	50	20	+
20	40	40	+

From the above table it will be observed that the composition comprising the SE, sodium malate and sodium glutamate have the function of imparting a relatively good freshness preservation ability to food.

EXAMPLE 12

A salmon on the market was sliced 1 cm in thickness and the resulting slices were immersed in aqueous solutions of Test Samples A – F shown below (the pH adjusted to 7.0) and after 2 minutes they were lightly rinsed with city water for 2 minutes and allowed to stand at room temperature. The same freshness tests as in Example 9 were made. The results are shown in Table 12.

Test Samples:

A. SE-(B) same as in Example 9) 24%
Sodium tartarate 48%
Sodium glutamate 28%

B. SE-(B) (ditto) 25%
Sodium tartrate 75%

C. SE-(B)(ditto) 24%
Sodium citrate 38%
Sodium tripolyphosphate 38%

D. SE-(B) (ditto) 24%
Sodium tartrate 48%
Glycine 28%

E. ABS type neutral detergent commercially available in the trade name of "ALCO-L" by Nippon Sunhome Co., Ltd.

F. Water alone

G. SE-(B) 24%
Sodium malate 48%
Sodium glutamate 28%

Table 12

Test Sample	Freshness Evaluation			
	after 1 hour	after 2 hours	after 3 hours	after 4 hours
A	0	0	0	+
B	0	++	+++	+++
C	0	++	+++	+++
D	0	0	++	+++
E	+	++	+++	+++
F	0	+	++	+++
G	0	0	+	++

From Table 12, it will be observed that the present inventive composition A has a superior freshness preservation capability.

EXAMPLE 13

The test sample A employed in Example 12 was used to prepare aqueous solutions with pH adjusted to various values shown in Table 13 and the solutions were similarly treated to make freshness evaluation tests. The results are shown in Table 13.

Table 13

pH	Freshness Evaluation			
	after 1 hour	after 2 hours	after 3 hours	after 4 hours
5.0	+	++	++	+++
5.5	0	0	+	+
6.0	0	0	0	+
6.5	0	0	0	0
7.0	0	0	0	+
7.5	0	0	+	+
8.0	+	+	++	+++

From the data shown Table 13 and after a further experimentation, it has been found that it is suitable to use the present inventive composition at pH5.5 – 7.5, preferably 6.0 – 7.0. It has also been ascertained that similar results are obtained in case where sodium tartrate is replaced by sodium malate.

EXAMPLE 14

Added to aqueous solutions of test sample A (pH adjusted to 7.0) employed in Example 13 was 0.04 percent of each of sucrose, sorbitol and table salt, and each of the solutions was similarly treated to make similar freshness evaluation test. The results are shown in Table 14.

Table 14

Additive	Freshness Evaluation		
	after 4 hours	after 5 hours	after 6 hours
Sucrose	0	0	+
Sorbitol	0	+	+
Table salt	+	+	++
No additive	+	++	+++

From Table 14, it will be observed that if sucrose or sorbitol is further added, the freshness preservation capability is sustained for a long time.

EXAMPLE 15

The following standard composition were made of the SE and the builders shown in Table 15–1, and using aqueous solutions containing 0.25 percent of said standard compositions (pH being adjusted to 7.0), dish washing tests were conducted by the Shell Method at 40°C. The results are shown in Table 15–2.

Standard composition:	15% SE, 30% builder and 55% water
Shell Method:	Soiling 2g/unit with tallow or butter-mayonnaise (1 : 1)

Table 15–1

Sample No.	SE	Builder
A	SE-(B) in Example 9	None
B	Do.	Sodium tartrate
C	Do.	Sodium glutamate
D	Do.	Sodium tartrate+sodium glutamate (1:1)
E	Do.	Sodium tripolyphosphate
F	SE-(A) in Example 9	Sodium tartrate+sodium glutamate (1:1)
G	Do.	Sodium tripolyphosphate
H	SE-(B) in Example 9	Sodium malate
I	Do.	Sodium malate+sodium glutamate (1:1)

Table 15-2

Kind of Soil	Number of Units Washed								
	A	B	C	D	E	F	G	H	I
Butter-mayonnaise (1 : 1)	3	5	7	19	12	21	14	19	20
Tallow	2	3	5	17	7	18	10	16	18

From Table 15–2, it will be observed that the present inventive composition is superior in detergency.

What is claimed is:

1. An aqueous detergent composition having a good and stable transparency consisting essentially of 3 to 25 parts by weight of at least one sucrose ester of a saturated or unsaturated fatty acid having from six to 22 carbon atoms, the degree of substitution of substitution of said sucrose ester given by the average value of the number of esterified fatty acid molecules per one sucrose molecule being within the range of 1.0 to 1.8, 3 to 45 parts by weight of an organic acid component which is a member selected from the group consisting of malic acid, alkali metal salts of malic acid and mixtures of the foregoing, and 30 to 94 parts by weight of water.

2. An aqueous detergent composition as defined in claim **1**, in which said sucrose ester consists essentially of a sucrose ester of a mixed fatty acid, at least 70 percent by weight of said mixed fatty acid being fatty acid having 12 carbon atoms and the degree of substitution of said sucrose ester given by the average value of the number of esterified fatty acid molecules per one sucrose molecule being within the range of 1.23 to 1.57.

3. An aqueous detergent composition as defined in claim **1**, further including a saccharide component which is selected from the group consisting of sucrose and sorbitol.

4. An aqueous detergent composition as defined in claim **1** in which said saccharide component is included in an amount of 5 to 30 percent by weight of the total amount of said composition.

5. An aqueous detergent composition having a good and stable transparency consisting essentially of 5 to 20 parts by weight of a sucrose ester of a saturated or unsaturated fatty acid having from six to 22 carbon atoms, the degree of substitution of said sucrose ester given by the average value of the number of esterified fatty acid molecules per one sucrose molecule being within the range of 1.0 to 1.8, 5 to 30 parts by weight of sodium malate and 50 to 90 parts by weight of water.

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