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(54) Title: BUBBLE COMPOSITION

(57) Abstract: A bubble composition which can become colourless by exposing to the atmosphere It comprises the following compounds: • Water • A surfactant, and • A colorant • A polymer • Preservatives Is characterized in that the colorant is an anionic pH indicator dye and the polymer is a weakly cationic polymer with capability to absorb the anionic dye and in that the composition also comprises an alkanolamine with a double function, helping to solve the pH indicator dye and absorbing carbon dioxide of the air to cause the pH mixture to decrease, so that the colour of the pH indicator change.

Bubble composition

Field of the invention

The present invention relates to a coloured bubble composition. Particularly, the present invention relates to an uniformly, non-toxic and washable coloured bubble composition which is excellent in formed richly and uniformly coloured bubbles and can become colourless itself along a brief environment exposure time.

Background art

Bubbles have been used on many occasions, from children's games to artistic expressions. Normally the have had a transparent colour.

For some time now, different solutions have been disclosed to relate compositions of coloured bubbles.

US patent 7910531B2 describes a composition to form coloured bubbles comprising at least water, a surfactant and a colorant. The colorants are acid dyes, FD&C (food, drug and cosmetic) dyes, food dyes, polymeric dyes, pigments or a combination thereof. Surfactants can be anionic surfactants, cationic surfactants, non-ionic surfactants and/or zwitter-ionic surfactants. The composition can also comprise humectants, preservatives, fragrances, dye blockers or cleaners. This document also discloses a method to prepare the composition consisting in heating a mixture of glycerine (humectant), colorant and water and then cooling the mixture and adding a surfactant. In an alternative method the surfactant may be added before heating the mixture. Compositions obtained by this method provide a bubble that is a uniformly coloured, and are non-toxic and/or washable.

US patent 2012/0035311A1 describes another composition to form coloured bubbles, which are obtained by mixing water, at least one humectant, and at least one water-soluble polymer to the mixture that may also function as a surfactant, a surfactant in

addition to the water-soluble polymer and a colorant. Surfactants can be anionic surfactants, cationic surfactants, non-ionic surfactants and/or zwitter-ionic surfactants. Colorants are acid dyes, FD&C dyes, food dyes, polymeric dyes, fluorescent dyes, azo dyes pH indicator dyes, polymeric colorants or a combination thereof. Other additives may be added to the composition including preservatives, fragrances, dye blockers, viscosity-inducing components, a suitable pH adjuster and/or small amount of organic solvents. That document also discloses a method to prepare the composition, that consist in mixing water, at least one humectant and at least one water soluble polymer to form a mixture and subsequently adding a colorant to the mixture. In an alternative method the mixture may be heated before adding the colorant, the humectant and the additional compounds.

All these compositions produce coloured, non-toxic and washable bubbles. The problem is that sometimes, these compounds ~~that~~ have stained the bubbles in such a way that ~~if~~ they stain clothes, or stain surfaces that are not easily cleaned, such as a carpet, or it is just a nuisance to have to wash yourself when a bubble has stained your skin.

Therefore, the present invention discloses a composition that solves the problems mentioned above, and has a uniformly, non-toxic and washable coloured bubble composition which is excellent in formed richly and uniformly coloured bubbles and can turn into colourless by itself.

Summary of the invention

As indicated above, the present invention provides a composition for obtaining coloured bubbles, in which the colour fades away in the air so that they do not stain the surfaces on which they explode, thus being irrelevant the fact whether the surface is washable or not, such as that of a cloth.

To obtain a composition in which the colour of the mixture fades into the air, a pH indicator is used. The pH indicator causes the colour of the solution depending on the pH of the solution. Other ways can be used to make colorant discolour in the air: oxidation bleaching with oxygen, photo degradation by sunlight and biodegradable by

microorganisms, but these methods are too slow to be used as a substance for a toy, where the colour effect must be quickly obtained.

One of the problems with pH indicating dyes for obtaining coloured bubbles is that they are normally not very soluble in water, and for the bubbles obtained to have a uniform and rich colour, a high concentration of the dye is necessary.

To solve this problem, an amino alcohol is added to the mixture according to the invention. Alkanolamines are good solvents for some pH-indicating compounds. These compounds can increase the concentration of the pH indicator to form rich, uniformly coloured bubbles. Alkanolamines are also often used in industry as carbon dioxide absorbers. By absorbing carbon dioxide present in the air, they cause the pH of the mixture to decrease, causing the pH of the mixture to drop, thus causing the change of the colour of the pH indicator. In this way, after few minutes the colour effect of the pH indicator disappear because of the reduction of the pH value.

Another problem is that you need to maintain the pH of the bubble wall for few minutes, otherwise the dye will precipitate what can cause the bubble to explode immediately. In order to maintain the pH, a buffer solution is used.

By using at least one weakly cationic polymer to absorb an anionic dye (anionic pH indicators are used) the concentration of the dye in the bubble wall is increased. The mixture also contains a surfactant, for example, but not limited to, an anionic surfactant, cationic surfactant, non-ionic surfactant and zwitter-ionic surfactant. The use of a weakly cationic polymer with good compatibility with water, anionic and non-ionic surfactants avoid the necessity of heating the mixture to dissolve the compounds.

It is not necessary to add moisturizers to the mixture, because adding humectants to the mixture will speed the discolouration of the bubble in the air.

The percentages in weight of the ingredients in any of the embodiments of the present invention shall be among those shown below:

Water	39.5 - 97.6%
Surfactant	1 - 20%
Weakly cationic polymer	0.1 - 5%

pH indicator dye	1 - 15%
Alkanolamine	0.1 - 5%
pH adjuster	0.1 - 15%
Preservatives	0.1 - 0.5%

The way to prepare the mixture is as follows. First, the pH indicator dye is dissolved in amino alcohol and a colour paste is formed. On the other hand, a mixture with purified water, some buffer solution and at least one preservative is formed. Then, at least one weakly cationic polymer and one surfactant are added to dissolve the mixture. Finally, the colour paste is added to the mixture.

Detailed description of the preferred embodiments

The coloured bubble composition comprises water. Water must be purified in order to prevent undesired substances from being found in it. The amount of water from about 10% to 90% by weight, suitable ranges include from about 50% to 80% by weight, and in particular from 69.8% to 86.45% by weight.

As stated above, a pH indicator causes the colour of the solution depending on the pH of the solution. A solution with Phenolphthalein or its derivatives can change from colour to clear with the decrease of pH. Representative examples include, but are not limited to, phenolphthalein, o-cresolpthalein, thymolphthalein or α-Naphtholphthalein. The amount of phenolphthalein or its derivatives from about 1% to 15% by weight, suitable ranges include from about 2% to 10% by weight, and in particular from 4% to 8% by weight.

As stated above alkanolamines are good solvents for some pH-indicating compounds. In particular, alkanolamines are good solvents for phenolphthalein and its derivatives. Adding alkanolamine compounds can increase the concentration of phenolphthalein or its derivatives to formed richly and uniformly coloured bubbles. Representative examples of alkanolamine compounds include, but are not limited to, ethanolamine, diethanolamine, triethanolamine, propanol amine, Isopropanol amine and mixtures of these materials. Because of the non-toxicity of the product, the alkanolamine compounds is ethanolamine. The amount of ethanolamine from about 0% to 10% by

weight, suitable ranges include from about 0.1% to 5% by weight, and particularly from 1% to 3% by weight.

A Buffer Solution is used to maintain pH from 9 to 11. In safety aspect, we use sodium bicarbonate/sodium carbonate for safety used for toys. The amount of Sodium Bicarbonate/Sodium Carbonate depends on the type of pH dye in a range from 0% to about 20% by weight, suitable ranges include from about 0.1% to 15% by weight, and particularly from 1% to 10% by weight.

A weakly cationic polymer is used to absorb the anionic colorant (phenolphthalein and its derivatives) to increase the concentration of colorant at the bubble wall. Polyquaternium-n(n=2-47) is a copolymer of Dimethyl diallyl ammonium chloride and acrylamide has good compatibility with water, as well as with anionic and non-ionic surfactants. The use of these cationic polymers, heating is not necessary for the colored bubble mixture. Representative examples include, but are not limited to, Polyquaternium-2, Polyquaternium-7, Polyquaternium-10 and Polyquaternium-39. The amount of the weakly cationic polymer from about 0.1% to 5% by weight, suitable ranges include from about 0.2% to 2% by weight, and particularly from 0.5% to 1% by weight.

The mixture also comprises preservatives.

The following are different examples of mixtures to obtain coloured bubbles of different colours that can themselves spontaneously become colourless:

Examples

The following examples show different compositions for forming bubbles of different colours.

Example 1

Pink

sodium dodecyl benzene sulfonate	2%
sodium alcohol ether sulphate	3%

Polyquaternium-2	0.5%
phenolphthalein	4%
ethanolamine	1%
Sodium Bicarbonate	3%
water	86%
sodium benzoate	0.5%

Example 2

Purple

Fatty Acid Methyl Ester Sulfonic Acid	5%
tritonX-100	4%
Polyquaternium-7	0.5%
o-cresolphalein	5%
ethanolamine	2%
Sodium Bicarbonate	5%
water	78.48%
Methylisothiazolinone	0.02%

Example 3

Blue

Sodium dodecyl sulfate	3%
Cocamidopropyl betaine	4%
Polyquaternium-10	0.5%
Polyquaternium-7	0.5%
thymolphthalein	7%
ethanolamine	3%
Sodium Carbonate	8%
water	73.7%
Ethyl 4-hydroxybenzoate	0.3%

Example 4

Green

sodium dodecyl benzene sulfonate	4%
N,N-dimethyldodecylamine-N-oxidesol	2%
Polyquaternium-2	0.5%
α-Naphtholphthalein	8%
ethanolamine	3%
Sodium Carbonate	10%
water	72.3%
propyl p-hydroxybenzoate	0.2%

CLAIMS

1.- A bubble composition which can become colourless by exposing to the atmosphere, comprising the following compounds:

- Water
- A surfactant, and
- A colorant
- A polymer
- Preservatives

Characterized in that the colorant is an anionic pH indicator dye and the polymer is a weakly cationic polymer with capability to absorb the anionic dye and in that the composition also comprises an alkanolamine with a double function, helping to solve the pH indicator dye and absorbing carbon dioxide of the air to cause the pH mixture to decrease, so that the colour of the pH indicator change.

2.- A bubble composition which can become colourless by exposing to the atmosphere, according to claim 1, characterized in that the composition is particularly the following:

Water	39.5 - 97.6%
Surfactant	1 - 20%
Weakly cationic polymer	0.1 - 5%
pH indicator dye	1 - 15%
Alkanolamine	0.1 - 5%

And in that it contains also:

pH adjuster	0.1 - 15%
Preservatives	0.1 - 0.5%

3.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 2, characterized in that the pH indicator is one or a combination of the following:

phenolphthalein

o-cresolpthalein

thymolphthalein
α-Naphtholphthalein
derivatives of these.

4.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 3, characterized in that the amount of pH indicator is in a range from 1% to 15% by weight, preferably from 2% to 10% by weight, and particularly from 4% to 8% by weight.

5.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 4, characterized in that alkanolamine compounds are one or a combination of the following:

ethanolamine
diethanolamine
triethanolamine
propanolamine
Isopropanolamine

6.- A bubble composition which can become colourless by exposing to the atmosphere, according to claim 5, characterized in that the amount of alkanolamine is in the range of 0% to 10% by weight, preferably from 0.1% to 5% by weight, and particularly from 1% to 3% by weight.

7.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 6, characterized in that the composition is kept in a pH from 9 to 11.

8.- A bubble composition which can become colourless by exposing to the atmosphere, according to claim 7, characterized in that for keeping the pH value in a range from 9 to 11 one or a combination of the following compounds are used:

Sodium Bicarbonate
Sodium Carbonate

9.- A bubble composition which can become colourless by exposing to the atmosphere, according to claim 8, characterized in that the amount of compounds for keeping the pH value in a range from 9 to 11 is dependent of the type of pH dye, and is in a range from 0% to 20% by weight, preferably from 0.1% to 15% by weight, and particularly from 1% to 10% by weight.

10.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 9, characterized in that the weakly cationic polymer is polyquaternium-n(n=2 to 47)

11.- A bubble composition which can become colourless by exposing to the atmosphere, according to claim 10, characterized in that the weakly cationic polymer is one or one combination of the following:

Polyquaternium-2
Polyquaternium-7
Polyquaternium-10
Polyquaternium-39.

12.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 10 to 11, characterized in that the amount of the weakly cationic polymer from 0.1% to 5% by weight, preferably from 0.2% to 2% by weight, and particularly from 0.5% to 1% by weight.

13.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 12, characterized in that is formed by the following compounds:

sodium dodecyl benzene sulfonate	2%
sodium alcohol ether sulphate	3%
Polyquaternium-2	0.5%
phenolphthalein	4%
ethanolamine	1%
Sodium Bicarbonate	3%
water	86%

sodium benzoate	0.5%

14.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 12, characterized in that is formed by the following compounds:

Fatty Acid Methyl Ester Sulfonic Acid	5%
tritonX-100	4%
Polyquaternium-7	0.5%
o-cresolphalein	5%
ethanolamine	2%
Sodium Bicarbonate	5%
water	78.48%
Methylisothiazolinone	0.02%

15.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 12, characterized in that is formed by the following compounds:

Sodium dodecyl sulfate	3%
Cocamidopropyl betaine	4%
Polyquaternium-10	0.5%
Polyquaternium-7	0.5%
thymolphthalein	7%
ethanolamine	3%
Sodium Carbonate	8%
water	73.7%
Ethyl 4-hydroxybenzoate	0.3%

16.- A bubble composition which can become colourless by exposing to the atmosphere, according to any of claims 1 to 12, characterized in that is formed by the following compounds:

sodium dodecyl benzene sulfonate	4%
N,N-dimethyldodecylamine-N-oxidesol	2%
Polyquaternium-2	0.5%
α-Naphtholphthalein	8%
ethanolamine	3%
Sodium Carbonate	10%
water	72.3%
propyl p-hydroxybenzoate	0.2%

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2017/081580

A. CLASSIFICATION OF SUBJECT MATTER
INV. C11D3/00 C11D3/22 C11D3/30 C11D3/37 C11D3/40
C11D3/48
ADD.
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)
A61K C11D A63H

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	WO 2006/105191 A2 (C2C TECHNOLOGIES LLC [US]) 5 October 2006 (2006-10-05) paragraphs [0003], [0014] - [0016], [0019] - [0024], [0030], [0034], [0035], [0188] - [0213], [0228], [0229] pages 159-163, paragraph [0353]; examples 1-6 pages 176-180, paragraph [0359]; examples 1-6 claims 7-14	1-16

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search	Date of mailing of the international search report
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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/EP2017/081580

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