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Abbas et al.(10) **Pub. No.: US 2010/0162474 A1**(43) **Pub. Date: Jul. 1, 2010**(54) **SELF ADHESIVE HARD SURFACE
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E03D 9/02 (2006.01)(52) **U.S. Cl.** **4/223**(57) **ABSTRACT**

The present invention relates to self adhesive hard surface cleaning blocks, and their use. It is an object of the present invention to provide a detergent block that can be easily positioned onto a hard surface; even a wet surface. It is a further object of the invention to provide a detergent block that rinses away in a number of flushes, and does not leave behind any residue that cannot be easily removed with e.g. a toilet brush. We have found that a hard surface cleaning block comprising surfactants forming a liquid crystalline phase upon contact with water meet the objects of the invention.

SELF ADHESIVE HARD SURFACE CLEANING BLOCK

FIELD OF THE INVENTION

[0001] The present invention relates to self adhesive hard surface cleaning blocks, and their use.

BACKGROUND PRIOR ART

[0002] Hard surface cleaning blocks, such as lavatory blocks are known in the art and are typically configured to provide an automatic and sustained release of active ingredients to a liquid passing the block and/or the release of perfume to the air. For example, they may be suspended in a container under the rim of a lavatory bowl or urinal such that, during a flushing cycle, water from the cistern flows over the block thereby dissolving a portion of the block and releasing active ingredients of the block into the lavatory bowl. They may also be used inside a dish washing machine or even for the purpose of manual dishwashing.

[0003] Different means of applying blocks to a toilet have been disclosed in the art. Holders for solid detergent blocks are for instance disclosed in EP-B1-586 137. An alternative to the lavatory block is a liquid dispenser device, such as the device disclosed in GB2389123.

[0004] Both the liquid and the solid rim device require a holder connecting the lavatory block to the toilet rim. Present day consumers do not like the idea of having to touch and handle a device that has been in the toilet for weeks, when refilling or replacement is required. Due to environmental reasons, disposal of such devices is also not appreciated by the consumers.

[0005] Attempts have been made to solve this problem, by various means. One such alternative is a tablet for use in the water cistern. However, this kind of device cannot be used in built-in water cisterns that are becoming more and more popular. Another alternative is a pump device having a dispenser at the toilet rim and a separate bottle with cleaning liquid outside the toilet. This option has the disadvantage of a tube connecting the rim device to the bottle with cleaning liquid.

[0006] The hard surface cleaning composition can even be applied directly onto the surface as disclosed in EP-A1-1 086 199, where a self adhesive paste is disclosed. Alternatively, co-pending European application nr 06124234.3, discloses a detergent composition comprising an adhesive phase.

[0007] A detergent block that can be easily positioned on a hard surface remains to be desired.

[0008] It is an object of the present invention to provide a detergent block that can be easily positioned onto a hard surface; even a wet surface.

[0009] It is a further object of the invention to provide a detergent block that constantly provides room scenting throughout the lifetime of the block.

[0010] It is a further object of the invention to provide a detergent block that rinses away in a number of flushes, and does not leave behind any residue that cannot be easily removed with e.g. a toilet brush.

[0011] It is a further object of the invention not to compromise the possibilities to shape the detergent block in any appealing way.

[0012] We have surprisingly found that a hard surface cleaning block comprising an adhesive phase meets at least one of these objects.

SUMMARY OF THE INVENTION

[0013] Accordingly, the invention provides a hard surface cleaning block, comprising

[0014] 50-80% by weight of a surfactant composition forming a liquid crystalline phase in the presence of water.

[0015] 1-50% by weight of Perfume.

[0016] The invention further provides methods for providing hygiene to a toilet.

[0017] The invention further provides a process for the manufacturing of the hard surface cleaning block of the invention.

[0018] These and other aspects, features and advantages will become apparent to those of ordinary skill in the art from a reading of the following detailed description and the appended claims. For the avoidance of doubt, any feature of one aspect of the present invention may be utilised in any other aspect of the invention. It is noted that the examples given in the description below are intended to clarify the invention and are not intended to limit the invention to those examples per se. Similarly, all percentages are weight/weight percentages unless otherwise indicated. Numerical ranges expressed in the format "from x to y" are understood to include x and y. When for a specific feature multiple preferred ranges are described in the format "from x to y", it is understood that all ranges combining the different endpoints are also contemplated.

DETAILED DESCRIPTION OF THE INVENTION

[0019] The hard surface cleaning block according to the invention comprises

[0020] a surfactant composition forming a liquid crystalline phase in the presence of water.

[0021] Perfume.

[0022] The invention relates to the formulation and process for making a self sticking block which can be used to directly stick on a hard surface. The self sticking behaviour is due to the formation of liquid crystalline phase in presence of water.

[0023] Said liquid crystalline phases have different rheological properties. In the current invention the phase transition behaviour of the composition in presence of water provides a way to stick the block in toilet, thus providing a self adhesive system. It has been found that cubic and hexagonal phases have good adhesion properties and have got very high viscosity. It is possible to have lamellar liquid phase in the composition which in contact with water forms hexagonal phase and gives adhesion properties to the block, thus providing the possibility to attach the composition to a wet surface.

[0024] The hard surface cleaning composition of the invention is intended to gradually release active ingredients, in particular perfume. This is achieved by providing a block that gradually erodes or dissolves when contacted or flushed with water.

[0025] One of the possible uses of the hard surface cleaning composition according to the invention is its application in a toilet. Toilet blocks preferably last for at least 50 flushes, more preferably at least 200 flushes, but not more than 300 flushes

[0026] The hard surface cleaning composition of the invention may be a solid, semi-solid or gel like composition in the meaning of Römpp Lexicon Chemie, 10th edition, Stuttgart/New York, 1997.

Surfactant

[0027] The surfactant forms a liquid crystalline phase in contact with water. These liquid crystalline phases help in the adhesive properties of the block. Besides adhesion properties these surfactants provide sufficient foam during use.

[0028] Suitable surfactants are non ionic surfactants. Suitable non ionic surfactants are alcohol ethoxylates with a high degree of ethoxylation, such as C14 to C24 fatty alcohols with 20 to 60 ethylene oxide groups, more preferably C16 to C20 fatty alcohols with 20 to 60 ethylene oxide groups. The composition may contain 0-15% of C10-C12 fatty alcohol ethoxylates with ethoxylation value of 2-10 for getting acceptable foaming properties. 10-80% of long chain fatty alcohol ethoxylates may be used to give some foaming properties but mainly for giving body or structure to the block. The chain length and the ethoxylation values are selected based on the melting point of the fatty alcohol ethoxylate. The preferred melting point for the ethoxylate is from 40° C. to 65° C. More preferred melting point is 45° C. to 60° C. and the most preferred range is 50° C. to 58° C.

[0029] Alternatively polysorbate nonionic surfactants may also be used. More preferably the polysorbate is a short chain (C10-C12) polysorbate, such as Tween 20, or longer chain (up to C18) unsaturated polysorbate, such as Tween 80. Polysorbate nonionic surfactants are found to have excellent foaming properties.

[0030] To further structure high levels of fragrance in the composition it is possible to use soap with a suitable chain distribution of C8-18 with at least 5-25% of C16-C18 saturated soap. Small levels of other anionic and amphoteric surfactants may also be used to give good foaming properties.

[0031] The anionic and amphoteric surfactants form liquid crystalline phases above Krafft point. These liquid crystalline phases help in the adhesion properties of the product to the hard surface. The surfactants with Krafft Point less than room temperature are suitable for this application. Anionic surfactants such as alpha olefin sulfonate, sodium lauryl ether sulphate and sodium lauryl sulphate are suitable for this application. CMEA, CDEA and the amphoteric surfactants such as CAP Betaine can also be used to get similar result. These surfactants can be used at 2-10% level in the formulation. The most preferred level can be 2-5%. Higher levels have been observed to give softer product.

[0032] The surfactant forming a liquid crystalline phase in the presence of water is present in the composition in a concentration of at least 50%, preferably at least 60% by weight. The surfactant is present in the block in a concentration of not more than 80%, preferably not more than 75%, more preferably not more than 65% by weight.

Perfume

[0033] The composition also comprises perfume to provide constant room scenting.

[0034] The perfume may be a single discrete ingredient, but more typically will be a complex blend of volatile liquid (and some solid) ingredients of natural and/or synthetic origin.

[0035] The perfume is present in the composition in a concentration of 1-50% by weight. More preferably, the composition comprises at least 4% of perfume. The composition preferably comprises not more than 40%, more preferably not

more than 30%, still more preferably not more than 20%, or even less than 10% by weight of perfume.

Optional Ingredients

[0036] The hard surface cleaning composition according to the invention may further comprise detergent active, builders, dyes, perfume, hygiene agents, antioxidants, radical scavengers, chelating agents, hydrotropes, anticorrosion agents, opacifiers, brighteners, preservatives and/or abrasives. However, further ingredient that compromise the transparent or translucent character of the composition are not preferred.

[0037] Suitable detergent active are e.g. described in "Surface Active Agents" Vol. 1, by Schwartz & Perry, Interscience 1949, Vol. 2 by Schwartz, Perry & Berch, Interscience 1958, in the current edition of "McCutcheon's Emulsifiers and Detergents" published by Manufacturing Confectioners Company or in "Tenside-Taschenbuch", H. Stache, 2nd Edn., Carl Hauser Verlag, 1981.

[0038] The composition may optionally comprise humectant. Humectants maintain both structure and clarity, enabling salvation of the soap chains/ribbons to maintain microcrystalline domains. If these domains are kept small and prevent further crystal nucleation, then the resultant structure is transparent. Preferred humectants are polyhydroxylated organic compounds, such as sorbitol and sucrose.

[0039] The humectant may be present in a concentration of 0 to 40% by weight of the composition. The humectant is preferably present in a concentration of at least 5%, but preferably not more than 20%, more preferably not more than 10%.

[0040] Solvents may also be present in the composition. Preferred solvents include glycols, (e.g. monpropylene glycol/propane-1,2-diol), poly alkylene glycols (e.g. PEG, PPG), water and short chain organic solvents (e.g. ethanol or isopropanol) and perfumes.

[0041] The solvent may be present in the composition in a concentration of 0 to 10%, preferably 1-10% by weight of the composition.

Block Size and Shape

[0042] The shape of the hard surface cleaning block may affect the adhesive properties of the block. It is preferred that the blocks have a hydrodynamic shape, to improve the erosion properties of the block which in turn helps in lasting adhesion of the block to the surface. Thus, round, smooth shapes are preferred over square/rectangular blocks with sharp edges, due to superior hydrodynamic behaviour.

[0043] The block life is directly related to the formulation and the size of the block. A normal size toilet block is between 30 and 50 grams, usually about 40 grams. This sort of block typically lasts for at least 100 flushes, preferably more than 200 flushes. The blocks preferably last for up to about 300 flushes.

[0044] It has been found that hard surface cleaning blocks with a high biocide concentration do not have an attractive appearance. Biocide precipitates generally make the block inhomogeneous. It is therefore an object to provide a block that is at least partially transparent or translucent. By at least partially transparent or translucent is meant that a 1 cm thick sample of the material transmits at least 5% of visible light, preferably at least 20% of visible light, more preferably at least 50% of visible light. More preferably the block is transparent. By transparent is meant that a 1 cm thick sample of the block transmits at least 70% of visible light, preferably at least 90%. Due to the presence of a dye, and almost inevitable

absorption and/or scattering of some of the light, the transmission is generally below 95% of visible light.

Methods for Use

[0045] The hard surface cleaning block may be used for cleaning hard surfaces of any kind. The most suitable surfaces are those that are regularly contacted with water, such as toilet surfaces, kitchen sinks and showers.

[0046] Thus the present invention provides a method for providing hygiene in a toilet comprising the step of applying the block according to the invention to the toilet surface. When the detergent phase is spent, the remains of the adhesive phase are preferably brushed or flushed away.

[0047] The present invention further provides a method for washing dishes comprising the steps of applying the block according to the invention to a kitchen sink and filling the sink with water. Thereby the water comes in contact with the block and releases part of the detergent phase to the water.

[0048] The present invention further provides a method for washing dishes, the method comprising the step of applying the block according to the invention to the inside of a dish-washing machine.

Adhesive Layer

[0049] The block according to the invention may optionally comprise an adhesive layer as disclosed in co-pending European patent application 6124234.3. Such adhesive phase may be preferred for attaching the hard surface cleaning composition according to the invention directly to a hard surface.

[0050] The adhesive phase comprises a hydrophobic adhesive material and optionally a hydrophilic adhesive material. The hydrophobic adhesive material is required for the invention to obtain suitable resistance to water. To obtain even stronger adhesion, the composition may further comprise a hydrophilic adhesive material.

[0051] The hydrophobic adhesive material comprises at least one of a hydrophobic compound with an aggregate melting point of 30 to 60° C., preferably 45 to 55° C. and a polymer. The hydrophobic compound is present in the hydrophobic adhesive material in a concentration of 25-60%, preferably 35-55%, more preferably 40-50% by weight based the hydrophobic adhesive material. The adhesive phase further comprises a polymer in a concentration of 5-75%, preferably 20-70%, more preferably 40-65%, most preferably 50-60% by weight based on the hydrophobic adhesive material.

[0052] The hydrophobic compound is preferably selected from natural or mineral oils, petrolatum, thickened oils, partially hydrogenated oils or fats, silicon oils and derivatives, thickened non polar solvent or low HLB non ionic surfactant and combinations thereof. Low HLB as defined herein means preferably less than 12, more preferably less than 10.

[0053] The polymer is preferably selected from natural and synthetic cellulosic polymers, such as carboxymethyl cellulose, polyacrylates, polyvinyl pyrrolidone, maleic/vinyl copolymers, silicon based polymers and mixtures thereof.

[0054] The polymers in the hydrophobic adhesive material are preferably water insoluble and preferably swell in contact with water.

[0055] The adhesive phase optionally comprises a hydrophilic adhesive material. To prevent instant dissolution of the hydrophilic adhesive phase upon contact with water, the hydrophilic adhesive material, if present, is preferably positioned in such a way that it is connected to both the hard surface and the detergent phase or an intermediate phase between the detergent phase and the adhesive phase, while it is surrounded by the hydrophobic adhesive material on all

other sides. Even though one would expect the hydrophilic adhesive material to be quickly dissolved by water, it is postulated, without wishing to be bound by a theory, that it is possible to obtain said further improved adhesion by the combination of hydrophobic adhesive material surrounding hydrophilic adhesive material, because the hydrophobic adhesive material stops the penetration of water while the hydrophilic adhesion material further improves the adhesive strength to the block.

[0056] The hydrophilic adhesive phase is preferably selected from starch based adhesive materials, hydrophilic polymers, fatty acid salts and/or mixtures thereof. One example of such a hydrophilic adhesive is a mixture comprising PVP polymer and sodium stearate.

[0057] The hydrophilic adhesive material is present in an amount of 0-60% by weight of the total adhesive phase. Preferably the ratio of hydrophobic:hydrophilic adhesive material is between 10:1 and 1:10, more preferably, between 5:1 and 1:5, still more preferably 4:1 and 1:2, most preferably between 2:1 and 1:1.

[0058] Either one or both of the adhesive materials may further comprise a suitable rheology modifier. Preferably, the rheology modifier is present in a concentration of 0-10%. Polymeric thickeners are an example of suitable rheology modifiers for fumed silica or silica oil; hydrogenated triglycerides or fatty acids are an example of suitable rheology modifiers for fatty acids and triglycerides; and an example of a suitable rheology modifier for anhydrous, hydrophobic oils is 12-Hydroxy stearic acid.

Hardness of the Composition

[0059] The hard surface cleaning composition of the invention may be a solid, semi-solid or gel like composition in the meaning of Römpp Lexicon Chemie, 10th edition, Stuttgart/New York, 1997.

[0060] The preferred hardness of the composition is dependent on its purpose. In the context of this invention, the composition hardness is measured by the method given below.

[0061] The composition hardness may be analysed using a Penetrometer PNR10 (ex SUR Berlin). The method involves using a probe to mechanically penetrate the sample of interest using a known force. The penetrometer needle is positioned manually close to the surface of sample under test and impact measurement carried out. The result is displayed in 'mm' penetration depth into the sample and replicate readings carried out on a different part of the composition. Low values correlate to hard samples, while higher values correspond to softer materials.

[0062] Suitable composition can range from hard to very soft gels in a range of 1 to 19 mm penetration measured using the method above.

[0063] For gels to be squirted from a tube, a hardness of 12 to 19 mm penetration is preferred.

[0064] For a composition to be used in a cage, for instance a cage holding a toilet rim composition, a hardness of 1 to 11 mm penetration is preferred.

[0065] For a composition that is adhered straight onto the toilet surface, e.g. by means of an adhesive layer attached to one side of the composition, a somewhat flexible composition, with a hardness of about 1 to 14 mm penetration, more preferably 3 to 12 mm, most preferably 4 to 9 mm is preferred.

Process for Manufacturing

[0066] The composition according to the invention is a solid or semi-solid in anhydrous form or at low level of water,

and when contacted with water, it forms a cubic phase or hexagonal liquid crystalline phase, providing adhesion properties of the composition to the surface.

[0067] The preferred process of manufacturing these types of products is by melt casting, which is a widely used method in the field.

[0068] Alternatively the composition according to the invention, may be formed into blocks by other traditional methods such as injection moulding or conventional extrusion processes.

EXAMPLES

[0069] The invention is now illustrated by means of the following non limiting examples.

Example 1

Formulations Using Soap Base of 85 Tallow/15 Coco

[0070]

Ingredients	1	2	3	4
Soap base (85/15)	35.0%	37.0%	30.0%	30.0%
Propylene Glycol	5.0%	—	—	5.0%
Glycerin	10.0%	5.0%	—	5.0%
Sorbitol	—	10.0%	10.0%	5.0%
Sugar	1.5%	—	5.0%	—
Triethanol Amine	—	1.5%	1.5%	—
Benzalconium Chloride	23.5%	23.5%	28.5%	30.0%
Water	15.0%	15.0%	13.0%	15.0%
Perfume	10.0%	8.0%	10.0%	8.0%
No of flushes	>120	>120	>120	>120

Example 2

Non Soap Formulations Using Non Ionic Surfactants

[0071]

	5	6	7	8	9	10
Benzalconium Chloride	23.5	23.5	23.5	20.0	23.5	30.0
C16-C18 Fatty alcohol 25 EO	56.5	59.5	52.5	42.0	45.5	47.0

-continued

	5	6	7	8	9	10
C9-C11 Fatty alcohol 8EO	6	6	6	3.0	6	6
C20-C22 Fatty alcohol 30 EO	10	0	8	25.0	10	10
Perfume	4	4	8	10	8	5
C20-22 fatty alcohol	0	5	0	0	5	0
PEG 6000	0	2	0	0	2	0
Alkyl Poly Glucoside	0	0	2	0	0	2
Total	100	100	100	100	100	100
No. of Flushes	300	160	160	>150	>150	>150

[0072] As can be seen in these examples, the blocks in various compositions last for at least 150 flushes and up to 300 flushes.

1. A hard surface cleaning composition, which is at least partially transparent or translucent, characterized in that it comprises:

a. 50 to 80% by weight of a surfactant forming a liquid crystalline phase in the presence of water, wherein the surfactant is an anionic or amphoteric surfactant, having a Krafft point below room temperature.

b. 1 to 50% by weight of perfume material.

and wherein the composition is in the form of a block having a hardness of 1-14 mm.

2. A hard surface cleaning composition according to claim 1, wherein the composition further comprises an adhesive layer, wherein the adhesive layer comprises a hydrophobic adhesive material comprising:

a. 25-60% of at least one hydrophobic compound, having an aggregate melting point of 30-60° C.; and

b. 5-75% of a polymer.

3. A composition according to anyone of claim 1 or 2, wherein the surfactant is a nonionic surfactant.

4. A composition according to claim 3, wherein the non-ionic surfactant is selected from alcohol ethoxylates with a high degree of ethoxylation and/or polysorbate nonionic surfactants.

5. Method for providing hygiene in a toilet comprising the steps of:

a. Applying the composition according to claims 1-6 to the toilet surface.

b. Flushing the toilet with water

6. Use of the composition of anyone of claims 1-6, for scenting a toilet room.

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