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Description

This invention relates to cleaning compositions, such as detergents and soaps, suitable for use in the cleaning of and removal of stains from fabrics, natural and synthetic fibres, plastics, metals and many other materials.

Various cleaning compositions are known for use in the cleaning of such materials. Many are however relatively expensive, harmful to the material being cleaned, and/or of only limited effectiveness.

It has previously been proposed to use soaps or detergents containing various conventional ingredients such as surfactants together with eucalyptus oil. There are in fact very many different eucalyptus oils made up of mixtures of different constituents in different proportions. In practice many of these, including in particular industrial grade eucalyptus oil, contain major constituents such as phellandrene which are harmful to the skin to a greater or lesser extent and thereby considerably limit the usefulness and possible applications of known such cleaning compositions.

It is an object of the present invention to avoid one or more of the above disadvantages.

The present invention provides a cleaning composition comprising a surfactant component and a terpene component consisting essentially of cineole substantially free of phellandrene.

Amongst the many various terpenes obtainable from various sources including natural sources such as cajuput oil, pine oil and eucalyptus oil and by synthetic routes, it has been found that cineole is a particularly effective stain removing or dispersing aid which at the same time is particularly well tolerated by the skins of most people. This latter feature is particularly important in practice because in many situations hand washing is the most convenient cleaning method for removing stains. This feature also allows the possibility of using the cleaning composition for removing stains from the hands. By using compositions wherein the terpene component consists essentially of cineole i.e. using cineole substantially free of harmful terpenes, in particular phellandrene, the hazards of using these are avoided. Preferably substantially pure cineole e.g. cineole BPC is used though in general cineole containing up to the order of 50% of other non-harmful terpenes may be used. Thus for example cajuput oil BPC and cineole containing up to 10% w/v of terpenes such as α-pinene and p-cymene and up to 20 or 30% w/w of terpenes such as α-terpineol may be used. Other aromatic compounds may also be tolerated in relatively small amounts depending on their degree of innocuousness. Thus small amounts e.g. less than 5% v/v of phenolic compounds may be present though preferably the cineole is substantially free of phenolic compounds. Although even lower proportions of cineole could be used this would normally be less desired since it would generally require the use of a larger amount of the terpene component in order to maintain the cleaning power of the composition.

A further significant advantage of the present invention is that cineole has been found to be particularly effective when used in cool or cold water thereby minimizing the risk of 'setting' of the stain which may occur when hot or even warm wash solutions are used.

Yet another significant advantage that may be obtained with the present invention is that surfaces which have been cleaned with a cleaning composition of the present invention exhibit a significant repellent effect on pests such as cockroaches, which has not been previously found with other terpene containing cleaners, thereby making the cleaning compositions particularly useful in shipboard and catering situations.

The cleaning compositions may be used by itself if desired either undiluted or diluted in a washing or cleaning medium such as water. More conveniently though the cleaning composition of the invention is used as an additive composition which is incorporated in a more or less conventional cleaning agent such as a soap or detergent composition.

The cineole may be used in various proportions to the other constituents in the cleaning composition depending inter alia on the nature of the other constituents, the constituents of any cleaning agent into which the composition is intended to be incorporated, and the materials to be cleaned e.g. metal or fibre, and in certain cases the nature of the stain material. In general though the cineole preferably comprises from 0.1 to 70% v/v of the cleaning composition, preferably from 3 to 70% in the case of an additive composition with the higher concentrations being preferred in the case of additives for detergents and the lower ones in the case of additives for soaps. In the case of additive compositions these may be incorporated in any convenient proportion relative to the detergent, or soap, for example at from 0.1 to 35% by volume, preferably at about 3% by volume.

In a further aspect the present invention provides a cleaning composition comprising a surfactant component and a terpene component comprising cineole substantially free of phellandrene, the cineole constituting from 0.1 to 70% v/v, preferably from 0.3 to 70% v/v, most preferably from 0.3 to 50% v/v, of the composition.

The cineole used may be either synthetic cineole (e.g. obtained by conversion of other terpenes having similar structures, for example from α-terpineol) or natural cineole obtained from certain cineole-containing eucalyptus species such as E. (Eucalyptus) Polybracteata, E. Smithii, E. Globulus, E. Viridis, E. dives "var" C, E. Australiana, E. Elaeophora, E. Sieroxylon, E. Leucoxylon, E. Cineorifolia, and E. dumosa, which generally contain 70% or more cineole, by recovery e.g. fractional distillation (conveniently using steam distillation) or cineole-containing cajuput oil sources such as the narrow-leaved forms of certain Melaleuca species e.g. M. Caujuputi and M. Leucadendron (Myrtaceae) or solvent extraction from the natural oils obtained therefrom. It is also possible and sometimes

preferable to use synthetic forms of the natural oil "mixtures" e.g. commercially available synthetic cajuput oil BPC obtainable from Zimmerman Hobbs Ltd. of Milton Keynes, England in place of the substantially pure cineole component.

Desirably the cineole used is not less than 95%, most desirably not less than 99% v/v pure, free of phellandrene, and contains not more than 1% of other terpenes.

Where natural or synthetic cajuput oil is used it is important that the narrow leaved type should be used since the main constituent of the broad-leaved type is iso eugenol which is not an effective cleaning agent.

The cineole may conveniently be employed as a solution, for example, in an aliphatic alcohol, preferably a lower alkyl alcohol, for example ethanol or methanol, conveniently in the form of methylated spirits. Desirably the cineole is used as a from 30 to 90% v/v solution, preferably a 40% v/v solution, especially in the case of a methylated spirit solution. In this case the methylated spirit solvent itself contributes to the stain removing properties of composition.

The surfactant component may comprise one or more of any suitable surfactant including anionic, cationic or nonionic surfactants; suitable surfactants which may be mentioned include sodium dodecylbenzene sulphonate such as the form commercially available from Albright & Wilson of Whitehaven, England, under the Trade Name "Nansa"®, or sodium lauryl ether sulphate or sodium lauryl sulphate also available from Albright & Wilson under the Trade Name "Empimin"®.

Advantageously there is also used an emulsifying and foam stabilising agent that is a stain softening agent such as a lauric acid diethanolamide. This may conveniently be in the form of 1:1 coconut oil diethanolamide, coconut oil containing some 48% lauric acid. Such materials are readily available commercially e.g. from Albright & Wilson of Whitehaven, England, under the Trade Name EMPILAN®. Other suitable materials that may be mentioned included water soluble derivatives, for example, diethanolamides, of fixed oils such as olive or castor oil or preferably palm oil or of aliphatic carboxylic acids such as oleic acid including for example lauric acid diethanolamide.

Other components and ingredients known in the art of cleaning compositions may also be used, including for example one or more of an alkali metal salt, for example aqueous sodium chloride; an emulsifying agent such as a sorbitol ester emulsifying agent; a disinfectant; colouring, bleaching, and/or brightening agents; a filler; and a perfume component, though it may be noted that the cineole itself imparts a generally acceptable scent to the cleaning composition.

Naturally the soap and detergent compositions may be employed in any conventional form including soap tablets, flakes and powder and liquid detergent and concentrate. Whilst the invention extends to an additive composition suitable for incorporation in a conventional soap detergent, or hand cleaning gel or cream, the composition of the invention may be used in its concentrate form or merely diluted in water.

The composition of the invention may be made by bringing the cineole and surfactant components into intimate a mixture with each other, and with any other ingredients, that may be required. Where a softening agent is used this is desirably added after any alkali metal salt has been added to the cineole surfactant mixture. The resulting composition is then suitable for use in amounts of 1—20% w/w as an additive for incorporation in a soap base comprising generally alkali metal hydroxide, water, and a fatty acid component such as beef tallow and coconut oil, or in a detergent optionally with water, to form an intimate blend therewith.

The following examples are provided to further illustrate the invention without in any way limiting the scope thereof.

Example 1

Preparation of Additive Composition

The composition was made from the following ingredients:

1. 1,8 — Cineole chemical formula $C_{10}H_{18}O$ systematic name: 1,3,3-trimethyl-2-oxabicyclo(2,2,2)octane.
   Cineole content: 99% v/v
   Other terpenes content: 1.00% v/v
   Obtained from Eucalyptus Polybracteata.
2. Surfactant
   Sodium dodecylbenzene sulphonate as 30% v/v aqueous solution commercially available from Albright & Wilson under the Trade Name "NANSA"
3. Emulsifying and Foam Stabilising Agent
   1:1 Coconut oil diethanolamide as commercially available from Albright & Wilson under the trade name EMPILAN.
4. Methylated spirit
5. Water
6. Sodium Chloride

Cineole (112 mls) was mixed with methylated spirit (167 mls) to produce a 40% v/v cineole solution and left for 5 to 10 minutes. The surfactant (112 mls) was then added with water (692 mls) followed by sodium chloride (3.5 g) and the resulting mixture stirred for 5 minutes. Finally the softening agent (167 mls) was added with stirring to produce a clear gel constituting the additive composition (1250 mls). All the above operations were carried out under ambient conditions.

Example 2

Preparation of Additive Composition

An additive composition was prepared from the following ingredients:

1. Cineole — 40% v/v solution in methylated spirits)

2. Surfactant — Sodium dodecylbenzene sulphonate as 30% v/v aqueous solution commercially available from Albright & Wilson under the Trade Name "NANSA"
3. Softening Agent — Coconut oil diethanolamide as commercially available from Albright & Wilson under the trade name EMPILAN.

The surfactant (20 mls) was added to the cineole solution (100 mls) and thoroughly mixed therewith. After standing for 5 minutes the softening agent (30 mls) was added and mixed in. The resulting additive composition was a clear liquid (150 mls).

Example 3

Soap Tablet

A conventional soap composition was made up by dissolving caustic soda (NaOH 30 g) in water 20 mls and progressively brought into admixture with natural fatty acids in the form of a blend of beef tallow (80% w/w) and coconut oil (20% w/w) (30 g) and stirred and boiled. After separation of the residual lye, additive composition (2.0 mls) prepared according to Example 2 was mixed in thoroughly the resulting mixture then being compressed in a mould to form a soap tablet.

Example 4

Preparation of Additive Composition

A cajuput oil based additive composition was prepared in accordance with the procedure of Example 1 but using a synthetic cajuput oil obtained from Zimmerman Hobbs Ltd. of Milton Keynes, England, in place of the substantially pure cineole component. The synthetic cajuput oil had a cineole content of 60.6% by weight and was substantially free of isoeugenol and phellandrene. Other terpene components of the oil used were α-terpineol 20.0%, w/w, p-cymene 6.2% w/w, α-pinene 5.1% w/w, and α-terpinene 1.25 w/w.

Example 5

Soap Tablet

The procedure of Example 3 was followed but using the additive composition of Example 4 in place of that of Example 2.

Claims

1. A cleaning composition comprising a surfactant component and a terpene component characterised in that the terpene component consists essentially of cineole substantially free of phellandrene.

2. A cleaning composition according to claim 1 wherein the terpene component consists essentially of natural or synthetic cajuput oil having a composition corresponding substantially to that of cajuput oil obtained from narrow leaved forms of Melaleuca Cajuputi.

A cleaning composition according to claim 2 wherein the terpene component has a cineole content of at least 50% w/w, and not more than 10% w/w of α-pinene, 10% w/v of p-cymene, and 30% w/w of α-terpineol.

4. A cleaning composition according to claim 1 wherein the terpene component has a cineole content of at least 95% w/w.

5. A cleaning composition according to any one of claims 1 to 4 wherein the terpene component contains not more than 5% w/w of phenolic compound.

6. A cleaning composition according to any one of claims 1 to 5 wherein the terpene component is in aliphatic alcoholic solution.

7. A cleaning composition according to any one of claims 1 to 6 further comprising an anionic or non-ionic surfactant.

8. A cleaning composition according to any one of claims 1 to 7 further comprising an emulsifying and foam stabilising agent that is a stain softening agent.

9. A cleaning composition according to claim 8 wherein said agent comprises lauric acid diethanolamide.

10. A cleaning composition according to any one of claims 1 to 9 which comprises a soap or detergent base and from 1 to 20% w/w of said surfactant and terpene components.

11. A cleaning composition according to any one of claims 1 to 10 which includes an alkali or alkaline earth metal salt.

Patentansprüche

1. Reinigungszusammensetzung, die eine aus einem oberflächenaktiven Mittel bestehenden Komponente und eine Terpenkomponente enthält, dadurch gekennzeichnet, daß die Terpenkomponente im wesentlichen aus Cineol besteht, das im wesentlichen frei ist von Phellandren.

2. Reinigungszusammensetzung nach Anspruch 1, wobei die Terpenkomponente im wesentlichen aus einem natürlichen oder synthetischen Kajuputöl besteht, dessen Zusammensetzung im wesentlichen der Zusammensetzung eines Kajaputöls entspricht, das aus engblättrigen Formen von Melaleuca Kajuputi erhalten wird.

3. Reinigungszusammensetzung nach Anspruch 2, wobei die Terpenkomponente einen Cineolgehalt von zumindest 50 Gew./Gew.-% hat und nicht mehr als 10 Gew./Gew.-% α-Pinen, 10 Gew./Vol.-% p-Cymen und 30 Gew./Gew.-% α-Terpineol enthält.

4. Reinigungszusammensetzung nach Anspruch 1, wobei die Terpenkomponente einen Cineolgehalt von zumindest 95 Gew./Gew.-% aufweist.

5. Reinigungszusammensetzung nach jedem der Ansprüche 1 bis 4, wobei die Terpenkomponente nicht mehr als 5 Gew./Gew.-% einer Phenolverbindung enthält.

6. Reinigungszusammensetzung nach jedem der Ansprüche 1 bis 5, wobei die Terpenkomponente in aliphatisch alkoholischer Lösung vorliegt.

7. Reinigungszusammensetzung nach jedem der Ansprüche 1 bis 6, die außerdem ein anioni-

sches oder nichtionisches oberflächenaktives Mittel enthält.

8. Reinigungszusammensetzung nach jedem der Ansprüche 1 bis 7, die außerdem ein emulgier- und schaumstabilisierendes Mittel enthält, das ein fleckenerweichendes Mittel ist.

9. Reinigungsmittel nach Anspruch 8, wobei dieses Mittel Laurinsäurediethanolamid enthält.

10. Reinigungsmittel nach jedem der Ansprüche 1 bis 9, das eine Seifen- oder Detergensbasis und 1 bis 20 Gew./Gew.-% der Surfactant- und Terpenkomponenten enthält.

11. Reinigungszusammensetzung nach jedem der Ansprüche 1 bis 10, die ein Alkali- oder Erdalkalimetallsalz einschließt.

Revendications

1. Composition de nettoyage comprenant un composant tensio-actif et un composant terpènique, caractérisée en ce que le composant terpènique consiste essentiellement en cinéole pratiquement dépourvu de phellandrène.

2. Composition de nettoyage suivant la revendication 1, dans laquelle le composant terpènique consiste essentiellement en une essence de cajeput naturelle ou synthétique ayant une composition correspondant pratiquement à celle d'une essence de cajeput obtenue à partir des formes de Melaleuca Cajuputi à feuilles étroites.

3. Composition de nettoyage suivant la revendication 2, dans laquelle le composant terpènique a une teneur en cinéole d'au moins 50% en p/p et pas plus de 10% en p/p d'α-pinène, 10% en p/p de p-cymène et 30% en p/p d'α-terpinéol.

4. Composition de nettoyage suivant la revendication 1, dans laquelle le composant terpènique a une teneur en cinéole d'au moins 95% en p/p.

5. Composition de nettoyage suivant l'une quelconque des revendications 1 à 4, dans laquelle le composant terpènique ne contient pas plus de 5% en p/p de composé phénolique.

6. Composition de nettoyage suivant l'une quelconque des revendications 1 à 5, dans laquelle le composant terpènique est en solution alcoolique aliphatique.

7. Composition de nettoyage suivant l'une quelconque des revendications 1 à 6, comprenant de plus un tensioactif anionique ou non-ionique.

8. Composition de nettoyage suivant l'une quelconque des revendications 1 à 7, comprenant de plus un agent émulsifiant et stabilisant la mousse qui est un agent ramollissant les taches.

9. Composition de nettoyage suivant la revendication 8, dans laquelle cet agent comprend du diéthanolamide d'acide laurique.

10. Composition de nettoyage suivant l'une quelconque des revendications 1 à 9, qui comprend une base de détergent ou de savon et de 1 à 20% en p/p des composants tensioactif et terpènique.

11. Composition de nettoyage suivant l'une quelconque des revendications 1 à 10, qui comprend un sel de métal alcalin ou alcalino-terreux.