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[54] **QUICK-DRYING SCOURING COMPOSITION**
5 Claims, No Drawings

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[50] **Field of Search** 51/303, 309, 295

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ABSTRACT: A scouring composition comprising a cationic surface active compound and a water-soluble abrasive which leaves a surface which has been cleaned dry, shiny and free from a gritty residue film.

QUICK-DRYING SCOURING COMPOSITION

This invention is directed to a stable, non gritty scouring composition which leaves the surface to which it is applied dry, shiny and free from a gritty residual film. The instant composition is designed so as to leave the surface which has been cleaned dry and shiny, thus eliminating the need for subsequent drying and polishing of said surface. In order to remove firmly adherent dirt from a surface of a solid material there have conventionally been employed in households, business enterprises and similar industries scouring agents which are composed predominantly of a water-insoluble component which provides said composition with a mechanical cleaning action. In addition, in compositions of this type, a water-soluble component has conventionally been used in a smaller quantity, said water-soluble component being employed to assist in the cleaning action of the water-insoluble abrasive component. In the past the water-insoluble salts have included ground quartz, marble, limestone, dolomite, pumice stone, or ground rock. In addition to the abrasive agent it has been customary to include in compositions of this type a compound which is useful in the bleaching of a solid surface, such as a compound which yields chlorine when contacted with water. Furthermore, it has been customary to include in compositions of this type anionic and nonionic detergents which impart surface active properties to the composition. The previously used anionic detergents have included sodium dodecylbenzenesulfonate, potassium dodecylbenzenesulfonate, sodium laurylbenzenesulfonate, sodium cetylbenzenesulfonate; the alkali metal salts of the higher alkylsulfonic acids and the alkali metal dialkyl sulfosuccinates, e.g., sodium dioctylsulfosuccinate, and sodium dihexylsulfosuccinate, sodium sulfoethylphthalate, sodium oleyl-p-anisidinesulfonate; sodium tetradecanesulfonate; sodium diisopropylnaphthalenesulfonate; sodium octylphenoxyethoxyethylsulfonate, etc. and the alkali metal alkyl sulfates, e.g. sodium lauryl sulfate. In addition the specific nonionic surface active agents have included alkaryl polyglycol detergents such as alkylphenolethylene oxide condensates (2–200 moles ethylene oxide), e.g., p-isooctyl phenol-polyethylene oxide (10 ethylene oxide units), long chain alcohol-ethylene oxide condensation products (2–200 moles ethylene oxide), e.g., dodecyl alcohol-polyethylene oxides having 4 to 16 ethylene oxide units per molecule, polyglycerol monolaurate, glycol dioleate, sorbitan monolaurate, sorbitan sesquioleate, the condensation products of ethylene oxide with sorbitan esters of long chain fatty acids (Tweens), alkylolamides, amine oxides, phosphine oxides, sulfoxides, etc.

While compositions of this type have been effective, there have been certain problems associated with their use, that is to say,that the insoluble compounds used as abrasives result in an unpleasant gritty residue which is left on the surface on which the composition has been employed. This necessitates spending considerable additional effort to remove this undesirable gritty film.

In an effort to eliminate this problem, it has been suggested to substitute a soluble salt for all or part of the insoluble compound. By substituting a soluble salt for an insoluble one, one obtains a composition which rinses away and leaves no residue, as all the components of the composition are then soluble and are rinsed away in the normal cleaning process. The salts conventionally used in a composition of this type include hydrated salts such as carbonates, bicarbonates, phosphates, borates, and halogen salts of alkali and alkaline earth metals. While these salts eliminated the gritty residue which was formerly a problem, they resulted in a composition which left the surface which was cleaned with a dull appearance.

A further objection to the currently known conventional scouring compositions is that said compositions tend to dry slowly, thus necessitating an additional step in the cleaning process, i.e., drying the surface of the cleaned article. This is necessitated by the fact that if the water remaining on the surface of the cleaned article is left to evaporate, said remaining water results in water marks being left on the surface. In addition, the cleaned article takes on a dull, dingy and dirty appearance rather than the bright and shiny appearance one would hope to obtain.

Therefore, it is an object of the instant invention to provide a scouring composition which is rapid drying and leaves a bright and shining appearance on the surface which has been cleaned.

Another object of the instant invention is to provide a composition which leaves the cleaned surface free from a non gritty residual film after a normal cleaning operation.

Another object of the instant invention is to provide a scouring composition comprising a water-soluble salt and a surface-active compound.

Yet another object of the instant invention is to provide a composition comprising a water-soluble salt and a cationic surface-active agent.

Still another object of the instant invention is to provide a composition comprising a water-soluble borate salt and a cationic surface-active agent.

Still another object of the instant invention is to provide a scouring composition comprising a water-soluble salt and an imidazoline-type cationic surface-active agent.

Yet a further object of this invention is to provide a scouring composition comprising a water-soluble borate salt and an imidazoline-type cationic surface-active agent.

Still a further object of the instant invention is to provide a scouring composition comprising a water-soluble salt, a cationic surface-active agent and other conventional scouring composition additives such as bleaches, perfumes, builders, germicides and coloring materials.

Yet a further object of the instant invention is to provide a scouring composition comprising sodium borate and 2-alkyl-1-hydroxyethyl imidazoline which is made from oleic acid.

The composition of the instant invention comprises a water-soluble salt and a cationic surface-active agent which are selected from water-soluble salts and cationic surface-active agents which are conventionally known in the art. The useful water-soluble salts include:

lithium phosphate
lithium potassium tartrate
lithium tartrate
lithium borate
lithium bromide
lithium carbonate
lithium chloride
lithium citrate
lithium fluoride
lithium iodide
lithium nitrate
magnesium biphosphate
dibasic magnesium citrate
dibasic magnesium phosphate
tribasic magnesium phosphate
sodium ammonium phosphate
sodium ammonium sulfate
sodium bicarbonate
sodium bisulfate
sodium bisulfite
sodium bitartrate
sodium bromate
sodium bromide
sodium carbonate
sodium chloride
sodium citrate
sodium hypophosphate
sodium nitrate
sodium nitrite
sodium borate
sodium perborate
monobasic sodium phosphate
dibasic sodium phosphate
sodium sulfate
sodium sulfide
calcium bromide

calcium chloride
calcium nitrate
calcium nitrite
dibasic calcium phosphate
monobasic calcium phosphate
calcium sulfite
potassium bicarbonate
potassium bisulfate
potassium borate
potassium bromide
potassium carbonate
potassium carbonate · 1½ water
potassium chloride
potassium citrate
potassium fluoride
monobasic potassium phosphite
potassium iodate
potassium iodide
potassium nitrate
potassium nitrite
potassium percarbonate
monobasic potassium phosphate
potassium pyrophosphate
potassium sulfate
potassium sulfite
potassium tartrate

The second component used in the instant composition is a cationic surface active compound. These compounds may be represented by the aliphatic fatty amines, aromatic fatty amines, fatty amides of aliphatic diamines, fatty amides of disubstituted diamines, fatty carboxamides, fatty aminoamide compounds, acid salts of complex amino organic compounds, quaternary ammonium compounds, amides of amino alcohols and quaternary ammonium derivatives, pyridines, quaternary ammonium bases derived from fatty amides of disubstituted diamines, quaternary ammonium bases of benzimidazolines, basic compounds of sulfonium, phosphonium and antimonium, polypropanol polyethanol amines, alkyl guanidine ammonium chloride salts and imidazolines, a further description of which may be found in British Pat. Nos. 465,166, 490,637, and 531,691, and in U.S. Pat. Nos. 2,168,253, 2,185,427, 2,195,194, and 3,170,876. These compounds have been marketed under various trade names including Ahcovel, Arquad, Soromine, Sapamine, Avitone, Aliquat, Andogen, and Cul-veram.

In particular these compounds may be exemplified by but are not limited to:

dimethyl phenyl benzyl ammonium chloride
lauryl trimethyl ammonium chloride
lauryl dimethyl ammonium chloride
cetyl trimethyl ammonium chloride
N-alkyl benzyl-N, N-diethyl-N-ethanol chloride
e.g. alkyl is C_1 to C_{20}
alkyl dimethyl dichlorobenzyl ammonium chloride
e.g. alkyl is C_1 to C_{20}
alkyl dimethyl benzyl ammonium chloride
e.g. alkyl is C_1 to C_{20}
stearyl dimethyl benzyl ammonium chloride
N-fatty trimethyl quaternary ammonium chloride
e.g. fatty is C_8 to C_{20}
N-difatty dimethyl quaternary ammonium chloride
e.g. fatty is C_8 to C_{20}
2-lauryl imidazoline
2-myristyl imidazoline
2-oleyl imidazoline
2-stearyl imidazoline
2-tallow oil imidazoline
2-tallow fatty acid imidazoline
2-coconut fatty acid imidazoline
2-capryl imidazoline
1-hydroxyethyl-2-heptadecanyl imidazoline hydrochloride
2-alkyl-2-hydroxyethyl imidazoline
e.g. alkyl is C_1 to C_{20}
alkyl methyl isoquinolinium chloride
e.g. alkyl is C_1 to C_{20}
cetyl dimethyl ethyl ammonium bromide
cetyl dimethyl benzyl ammonium chloride
dimethyl hexadecyl amine
N-alkyl trimethyl ammonium chloride
e.g. alkyl is C_1 to C_{20}
dicocodimethyl ammonium chloride
disoyadimethyl ammonium chloride
distearyldimethyl ammonium chloride
distearyldimethyl ammonium chloride
polyoxyethylene fatty amine with polyoxyethylene sorbitol oleate
benzyl trimethyl ammonium chloride
cetyl dimethylethyl ammonium chloride
dodecyl benzyl ammonium chloride
tetradecyl benzyl ammonium chloride
hexadecyl benzyl ammonium chloride
N-coco-1,3-diaminopropane monoadipate
N(lauroyl colamino formyl methyl) pyridinium chloride
cetyl trimethyl ammonium chloride
lauryl pyridinium bromide
lauryl isoquinolinium bromide
dodecyl benzene trimethyl ammonium chloride
alkyl dimethyl ethyl ammonium sacchrinate
e.g. alkyl is C_1 to C_{20}
soya fatty dialkyl benzene ammonium chloride

In the above list the reference to alkyl compounds includes, as noted, the alkyls such as methyl, ethyl, propryl, isopropyl, butyl, isobutyl, n-pentyl, isopentyl, heptyl, nonyl, decyl, dodecyl, tetradecyl, hexadecyl, octadecyl, eicosyl, etc. radicals.

In addition to the above water-soluble salts and cationic surface-active agents, bleaching compounds may also be used in conjunction with the instant invention. The useful bleaching compounds include compounds such as trichlorocyanuric acid, the sodium salt of trichlorocyanuric acid, dichlorocyanuric acid, the sodium salt of dichlorocyanuric acid, chlorinated trisodium phosphate, calcium hypochlorite, the monopersulfates such as potassium monopersulfate and sodium monopersulfate (marketed as Oxone), and compounds of a similar type.

The compositions of the instant invention, in addition to water-soluble salts and cationic surface-active agents, may also include conventional additives such as builders, brighteners, germicides, soil-suspending agents, antiredeposition agents, antioxidants, coloring materials (dyes and pigments), perfume, water-soluble alcohols, and compatible surfactants including nonionics e.g. polyethylenoxy alcohols such as lauryl alcohol and 3 moles ethylene oxide.

The following examples are provided as being exemplary of the compositions encompassed by the instant invention, which is not to be deemed as limited thereto. In addition, these examples teach that by use of the instant composition one obtains a cleaned surface which dries without the necessity for a separate drying step and results in a bright and shining surface area.

EXAMPLE I

A composition comprising:
Puffed borax 20
Sodium borate pentahydrate 75
Stearyl dimethyl ammonium chloride 5

The composition was prepared by mixing the ingredients in a Hobart mixer for 15 minutes. This composition was applied to one-half of a porcelain tile while the other half was cleaned with a conventional cleanser composition comprising an anionic detergent, a bleach, a water-insoluble abrasive, having the following composition:

Fine Silex 87.840
Perfume 0.250
Phthalocyanine Blue 0.125
Sodium Bromide 0.700
Sprayed LAS*

* Linear sodium tridecyl benzene sulfonate detergent 6.635.

Trisodium phosphate, anhydrous 3.950

Trichlorocyanuric acid, sodium salt 0.500

The side cleaned with the composition of the instant invention was dry, shiny, and was left clear of any gritty residue within two seconds, while the side cleaned with the control composition necessitated a separate drying step even after 2 minutes and there remained a residue thereon.

EXAMPLE II

A composition comprising:
Stearyl dimethyl ammonium chloride 5
Sodium chloride, powdered 95 was prepared by mixing the ingredients in a Hobart mixer for 15 minutes. This composition was tested as in example I as against the control of example I. This composition left the cleaned surface bright, dry and shiny, while the control had to be wiped dry. Furthermore, the surface cleaned by the control was covered with a gritty residual film while the surface cleaned by the composition of the instant invention was left clean.

EXAMPLE III

A composition comprising:
Borax pentahydrate 96.9
2-oleyl- 2-hydroxyethyl imidazoline 3.0
Perfume 0.1 was prepared by mixing the ingredients in a Hobart mixer for 15 minutes. This composition was tested as in example I as against the control of example I. This composition left the cleaned surface bright, dry and shiny, while the control had to be wiped dry. Furthermore, the surface cleaned by the control was covered with a gritty residual film while the surface cleaned by the composition of the instant invention was left clean.

EXAMPLE IV

A composition comprising:
Borax (pentahydrate) 96.4
Trichlorocyanuric acid, sodium salt 0.5
2-oleyl-2-hydroxyethyl imidazoline 3.0
Perfume 0.1 was prepared by mixing the ingredients in a Hobart mixer for 15 minutes. This composition was tested as in example I as against the control of example I. This composition left the cleaned surface bright, dry and shiny, while the control had to be wiped dry. Furthermore, the surface cleaned by the control was covered with a gritty residual film while the surface cleaned by the composition of the instant invention was left clean.

EXAMPLE V

A composition comprising:
Sodium carbonate 98.4
Sodium salt of trichlorocyanuric acid 0.5
Trimethyl benzyl ammonium chloride 1
Perfume 0.1 was prepared by mixing the ingredients in a Hobart mixer for 15 minutes. This composition was tested as in example I as against the control of example I. This composition left the cleaned surface bright, dry and shiny, while the control had to be wiped dry. Furthermore, the surface cleaned by the control was covered with a gritty residual film while the surface cleaned by the composition of the instant invention was left clean.

EXAMPLE VI

A composition comprising:
Sodium sulfate 97.8
Cetyl pyridinium chloride 1.0
Chlorinated trisodium phosphate 1.0
Perfume 0.1
Color 0.1 was prepared by mixing the ingredients in a Hobart mixer for 15 minutes. This composition was tested as in example I as against the control of example I. This composition left the cleaned surface bright, dry and shiny, while the control had to be wiped dry. Furthermore, the surface cleaned by the control was covered with a gritty residual film while the surface cleaned by the composition of the instant invention was left clean.

EXAMPLE VII

Example I is repeated several times, except that the cationic agent is replaced as follows:
A. lauryl trimethyl ammonium chloride
B. stearyl dimethyl benzyl ammonium chloride
C. dimethyl isoquinolinium chloride
D. cetyl dimethyl ethyl ammonium bromide. The results are comparable to example I.

EXAMPLE VIII

Examples I, IV, V, and VII are repeated except that in each instance a nonionic surfactant is added as follows (with a concomitant reduction in the inorganic salt content):

	Parts
A. lauryl alcohol and 3 ethylene oxide	3.0
B. cetyl alcohol and 15 ethylene oxide	2.5
C. nonyl phenol and 10 ethylene oxide	4.5
D. dinonyl phenol and 20 ethylene oxide	3.0

Excellent results are obtained in all instances.

EXAMPLE IX

Examples I, II and III are each repeated adding 0.5 parts of sodium trichlorocyanurate.

EXAMPLE X

Examples IV, V and IX are each repeated replacing the sodium trichlorocyanurate with the following (in separate formulations):
A. chlorinated trisodium phosphate
B. sodium dichlorocyanurate
C. calcium hypochlorite
D. potassium monopersulfate
The results of examples IX and X are excellent.

Each of the ingredients employed in the instant composition may be used in those amounts which are conventional in the art. In specific, the water-soluble abrasive may be used in amounts of from about 40 percent to 99 percent and the cationic surface-active agents may be used in amounts of from 0.01 percent to 30 percent. Those other additives which may be employed are also used in those amounts which are conventional.

While various preferred embodiments of the present invention have been illustrated by way of specific example, it is to be understood that the present invention is in no way to be deemed as limited thereto, but should be construed as broadly as any or all equivalents thereof.

I claim:

1. A scouring composition devoid of water-insoluble components and consisting essentially of from about 40 to 99 percent of a water-soluble abrasive selected from the group consisting of alkali and alkaline earth metal salts and from 0.1 to 30 percent of a 2-alkyl-2-hydroxyethyl imidazoline.

2. The scouring composition of claim 1 wherein the water-soluble abrasive is selected from the group consisting of borax, puffed borax, sodium chloride, sodium phosphate, sodium pyrophosphate, sodium orthophosphate, sodium carbonate, potassium bicarbonate, potassium sulfate or mixtures thereof.

3. The composition of claim 1 wherein the water-soluble abrasive is borax.

4. The composition of claim 1 wherein the 2alkyl moiety is 2oleyl.

5. The composition of claim 1, wherein the water-soluble abrasive is sodium chloride.