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Austin

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[54] **MEANS TO INHIBIT OVERGLAZE DAMAGE
BY AUTOMATIC DISHWASHING
DETERGENTS**

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8/108

[57] ABSTRACT

A cleaning composition particularly adapted for wash-
ing dishes, glasses and silverware in mechanical devices
such as automatic dishwashers and capable of inhibit-
ing overglaze attack, containing as an essential ingredi-
ent, a precipitated silico-aluminate compound.

[56] References Cited

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12 Claims, No Drawings

MEANS TO INHIBIT OVERGLAZE DAMAGE BY AUTOMATIC DISHWASHING DETERGENTS

The present invention relates in general to cleaning compositions, and in particular to the provision of cleaning compositions beneficially adapted for use in connection with the cleaning of substrates such as dishware and the like having a glazed surface.

Many of the cleaning compositions heretofore recommended for use in connection with the cleaning of substrates having a glazed surface have been subject to one or more significant disadvantages. Perhaps the paramount difficulty involved relates to the pronounced tendency of such compositions to attack or otherwise deleteriously affect substrates such as typified by glass, porcelain, aluminumware and the like, thereby leading to impairment of such articles. As will be recognized, aesthetic considerations, as well as functional criteria, are of importance as regards the suitability of a given cleaning composition, and especially when contemplated for use in connection with the cleaning of fine china and the like having an ornamental or decorative surface. The magnitude of the problems encountered can be readily appreciated in view of the significant risk of economic loss entailed. Without intending to be bound by any theory, it has nevertheless been hypothesized in explanation of the overglaze attack phenomenon that one or more of the ingredients present in the cleaning composition exhibit a pronounced, if not intolerable, tendency to attack the flux constituents present in the bonding material utilized in securing the decorative or ornamental pattern to the substrate and especially under the relatively severe alkaline conditions necessarily extant in the cleaning solution during actual use.

In an effort to overcome or otherwise ameliorate the foregoing and related difficulties, considerable research activity has been necessary in the development of cleaning compositions specifically and advantageously adapted to minimize the overglaze attack problem and yet capable of providing the requisite measure of cleaning activity. Thus, much of the methodology heretofore promulgated involves as an essential expedient the use of one or more additives which purportedly function as inhibitors under the conditions normally encountered in cleaning. In this regard, a variety of such inhibitor additives has been recommended by the prior art, such as aluminum formate, aluminum acetate, alkali metal aluminum orthophosphates, and alkali aluminate, zincate or berylliate. Although providing relatively effective means whereby to enable substantial alleviation of the overglaze attack problem, the overall advantage realized is often marginal in view of concomitant problems having as their genesis the objectionable tendency of the cleaning composition, and more particularly the inhibitor compound, to yield unsightly deposits or precipitates on the surface of the substrate treated, not to mention the contacting surfaces of the washing receptacle. As will be recognized, the fugitive behavior of the inhibitor material may be such as to substantially vitiate any advantage which might otherwise accrue from its use, thereby detracting from commercial feasibility.

Another problem encountered in dishwasher products is the staining of plastics resulting from the presence of colorants utilized as a decorative additive in said products. Colorants have been added to dishwasher products to render them more attractive to the

buying public, but are not intended to participate in the washing operation. However, their presence has created a staining problem, particularly of the plastic parts of the automatic dishwasher and any other plastics present therein.

Still other difficulties encountered by dishwasher products is the tendency of said granular products to cake in the package before use and/or in the machine dispenser cup. Such caking reduces the shelf-life of the product and concomitantly reduces its efficacy.

Accordingly, it has now been discovered that the inclusion of a quantity of a precipitated silico-aluminate compound in the detergent formulation surprisingly inhibits attack on the glaze on china, prevents the staining of plastics, and inhibits caking of the product, thereby enhancing its cleaning efficacy. While the proportion of the silico-aluminate compound in a detergent formulation may be varied, a desirable range is from about 4% to 10% by weight of the total formulation, a preferred range being from approximately 4% by weight to approximately 9% by weight of the total formulation.

Thus, a primary object of the present invention resides in the provision of cleaning compositions substantially devoid of any tendency to attack the glazed surface of a wide variety of substrates.

Another object of the present invention resides in the provision of free-flowing cleaning compositions capable of providing superior cleaning activity.

Still another object is the provision of a colored, non-staining dishwasher product.

Other objects and advantages of the present invention will become more apparent hereinafter as the description proceeds.

In accordance with the present invention, a free-flowing, non-staining, water-soluble alkaline detergent composition for automatic dishwashing comprises a major amount of water-soluble organic and/or inorganic builder salts, and a precipitated silico-aluminate compound as a protector against overglaze attack and plastic staining.

The silico-aluminate compound contemplated for use in the present invention is a precipitated hydrated chemical compound having a SiO_2 content of 66–77%, an Al_2O_3 content of 9–13%, and a Na_2O content of 5–6% by weight. The preferred silico-aluminate compound is Zeolex, a commercial product available from the J.M. Huber Corporation of New York City, N.Y. This product is in the form of a powder which is the preferred form because of the ease with which it can be formulated into a dishwasher detergent, although any finely divided, precipitated silico-aluminate may be utilized herein. Zeolex 23A and 35A have specific gravities of 2.1 and 2.3, respectively, a 20% aqueous solution thereof exhibit a pH of 9–11, are known anti-caking agents, have good water-adsorptive properties (can adsorb moisture up to 75% of their weight, yet remain free-flowing) and will readily adsorb oily products. However, its overglaze protective properties in a dishwasher product are unique and totally unexpected, amounts as low as 4% by weight of the total composition being effective in inhibiting overglaze attack. In addition to overglaze protection, Zeolex is an effective anti-staining agent, as evidenced by the plastic-staining tests wherein no staining is evidenced by the colored materials normally found in dishwasher products. The Zeolex has also been found to be an effective inhibitor

of aluminum discoloration during the cleaning process. Still another attribute of dishwasher products containing Zeolox is the ability to retain both the fluidity with no evidence of caking and its stability with no detectable aroma, even after 4 weeks of rapid aging at room temperature, 100°F and 120°F. This long shelf-life renders it particularly attractive commercially. It has also been found that Zeolox-containing products aid in softening the water by removing the calcium and magnesium ions from the water, thereby inhibiting unsightly precipitation onto the surfaces of the washed tableware.

The water-soluble builder salts utilized in the instant detergent composition comprises one or more inorganic and/or organic basic and neutral water-soluble salts. The builder salts are employed in amounts ranging up to about 95%, i.e., 40–95% by weight, with a range of from about 60% to about 90% by weight of the composition being preferred. Suitable inorganic builders include, without necessary limitation, trisodium phosphate, tetrasodium pyrophosphate, sodium acid pyrophosphate, sodium tripolyphosphate hexahydrate, sodium monobasic phosphate, sodium dibasic phosphate, sodium hexameta phosphate, sodium silicates, $\text{SiO}_2/\text{Na}_2\text{O}$ of 1/1 to 3.2/1, e.g. (sodium metasilicate), sodium carbonate, sodium sulfate, borax, etc. Other alkali metal salts such as potassium and lithium; ammonium and substituted ammonium salts such as methylammonium, diethanolammonium and triethanolamine; and amine salts such as mono-, di-, and triethanolamine, methylamine, octylamino, diethylenetriamine, triethylenetetramine and ethylenediamine are efficacious. Suitable organic builders include salts of organic acids, and, in particular, the water-soluble salts of aminopolycarboxylic acids and hydroxycarboxylic acids. The acid portion of the salt can be derived from acids such as nitrilodiacetic; N-(2-hydroxyethyl) nitrilodiacetic acid, nitrilotriacetic acid (NTA), ethylenediamine tetracetic acid, (EDTA); N-(2-hydroxyethyl) ethylenediamine triacetic acid; 2-hydroxyethyl iminodiacetic acid; 1,2-diaminocyclohexanediamic acid; diethylenetriamine penta-acetic acid, citric acid, and the like. The builder salt is preferably employed in amounts sufficient to yield a pH in water of from 9.5 to 12, preferably from 10 to 11, in order to obtain optimum detergency performance.

The cleaning compositions described herein may further be provided with one or more bleaching agents, which may, in general, be defined as encompassing compounds capable of liberating a hypohalite such as hypochlorite chlorine and/or hypobromite bromine on contact with aqueous media. Particular examples of bleaching agents include the dry, particulate heterocyclic N-bromo and N-chloro imides such as trichlorocyanuric, tribromocyanuric acid, dibromo- and dichlorocyanuric acid, the salts thereof with water-solubilizing cations such as potassium and sodium and mixtures thereof. Particular compounds found useful are potassium dichloroisocyanurate and trichloroisocyanuric acids.

Other N-bromo and N-chloro imides may also be used, such as N-brominated and N-chlorinated succinimide, malonimide phthalimide and naphthalimide. Other compounds include the hydantoin, such as 1,3-dibromo and 1,3-dichloro-5,5-dimethylhydantoin; N-monochloro-5,5-dimethylhydantoin, methylene-bis (N-bromo-5,5-dimethylhydantoin); 1,3-dichloro-5, methyl-

5-N-amyldantoin, and the like. Other useful hypohalite liberating agents comprise tribromomelamine and trichloromelamine. Dry, particulate, water-soluble anhydrous inorganic salts are likewise suitable for use such as lithium hypochlorite and hypobromite. The hypohalite-liberating agent may, if desired, be provided in the form of a stable, solid complex or hydrate, such as sodium p-toluene-sulfobromamine-trihydrate, sodium benzene-sulfo-chloramine-dihydrate, calcium hypobromite tetrahydrate, calcium hypochlorite tetrahydrate, etc. Brominated and chlorinated trisodium phosphate formed by the reaction of the corresponding sodium hypohalite solution with trisodium phosphate (and water as necessary) likewise comprise efficacious materials. The present invention contemplates, as an additional embodiment, the use of bleaching agents capable of liberating hypochlorite as well as hypobromite such as, for example, the N-brominated, N'-chlorinated heterocyclic imides, as, for example, the N-bromo, N'-chlorocyanuric acids and salts thereof, e.g., N-monobromo-N, N-dichloro-cyanuric acid, N-monobromo-N-monochlorocyanuric acid, sodium N-monobromo-N-monochlorocyanurate, potassium-N-monobromo-N-monochlorocyanurate; and the N-brominated, N-chlorinated hydantoin, e.g., N-bromo-N-chloro-5,5-dimethylhydantoin and N-bromo-N-chloro-5-ethyl-5-methyl hydantoin.

The hypohalite-liberating compound is employed in an amount of from 0.5 to 5% by weight of the composition, and preferably in an amount of from about 0.5 to 3% by weight thereof. In any event, the hypohalite material should preferably be employed in amounts sufficient to yield from about 0.5–3% available chlorine, bromine, etc. in order to assure optimum results.

In general, efficacious cleaning compositions may be formulated in accordance with the present invention by the use of a precipitated silico-aluminate compound in amounts of about 4 to 10% by weight of total composition and up to about 95%, i.e., from 40% to 95% by weight of at least one compound selected from the group of water-soluble organic detergent, water-soluble inorganic or organic neutral or alkaline builder salt, bleaching agent capable of liberating hypohalite on contact with aqueous media and caustic alkali. The bleaching agent is essential to the implementation of those embodiments of the present invention directed to industrial bottle cleaning compositions.

Water-soluble organic detergents, i.e., surface-active components, may be employed, such materials being well known in the prior art, the term detergent comprehending species of the anionic, cationic, amphoteric and zwitterionic types. In formulating an automatic dishwasher product, it is preferred to utilize a low foaming detergent such as the non-ionics.

Non-ionic surface-active agents include those surface-active or detergent compounds which contain an organic hydrophobic group and a hydrophilic group which is a reaction product of a solubilizing group such as carboxylate, hydroxyl, amido or amino with ethylene oxide or with the polyhydration product thereof polyethylene glycol.

As examples of nonionic surface-active agents which may be used, there may be noted the consideration products of alkyl phenols with ethylene oxide, e.g., the reaction product of isooctyl phenol with about six to 30 ethylene oxide units; condensation products of alkyl thiophenols with 10 to 15 ethylene oxide units; conden-

sation products of higher fatty alcohols of monoesters of hexahydric alcohols and inner ethers thereof such as sorbitan monolaurate, sorbitol mono-oleate and mannitan monopalmitate, and the condensation products of polypropylene glycol with ethylene oxide.

Further suitable detergents are polyoxyalkene esters of organic acids, such as the higher fatty acids, rosin acids, tall oil, or acids from the oxidation of petroleum, and the like. The polyglycol esters will usually contain from about 8 to about 30 moles of ethylene oxide or its equivalent, and about 8 to 22 carbon atoms in the acyl group. Suitable products are refined tall oil condensed with 16 to 20 ethylene oxide groups, or similar polyglycol esters of lauric, stearic, oleic and like acids.

Additional suitable non-ionic detergents are the polyalkylene oxide condensates with higher fatty acid amides, such as the higher fatty acid primary amides and higher fatty acid mono- and fatty Suitable agents are coconut fatty acid amide condensed with about 10 to 30 moles of ethylene oxide. The fatty acyl group will similarly have about eight to 22 carbon atoms, and usually about 10 to 18 carbon atoms in each product. The corresponding sulphonamies may also be used, if desired.

Other suitable polyether non-ionic detergents are the polyalkylene oxide ethers of higher aliphatic alcohols. Suitable alcohols are those having a hydrophobic character, and preferably eight to 22 carbon atoms. Examples thereof are iso-octyl, nonyl, decyl, dodecyl, tridecyl, tetradecyl, hexadecyl, octadecyl and oleyl alcohols, which may be condensed with an appropriate amount of ethylene oxide, such as at least about 6, and preferably about 10-30 moles. A typical product is tridecyl alcohol, produced by the Oxo process, condensed with about 12, 15 or 20 moles of ethylene oxide. The corresponding higher alkyl mercaptans or thioalcohols condensed with ethylene oxide are also suitable for use in compositions of the present invention.

Examples of other suitable wetting agents include low-foaming anionic materials such as dodecyl hydrogen phosphate, methyl naphthalene sulfonate, sodium 2-acetamido-hexadecane-1-sulfonate, and mixtures thereof. Mixtures of the foregoing wetting agents may also be employed, and, if desired foam-reducing additive may be added as appropriate to minimize undesirable foaming tendencies of these wetting agents under conditions of use.

The detergent material is employed in concentrations ranging from about 0.5% to about 5% by weight of total composition, with a range of 1% to 3% being particularly preferred.

This, a relatively minor amount of nonionic type detergent, that is, about 2-4%, is especially beneficial inasmuch as it acts as a foam depressant as well as a detergent agent in an automatic dishwashing solution.

Minor amounts of other additives which do not interfere with the cleaning, anti-corrosive, and overglaze protection properties of instant composition may be added such as pigments, dyes, perfume, fillers, extenders, suds builders, suds depressors, anti-redeposition agents, etc. In some instances it may be commercially feasible to add said ingredients to render them more attractive to the consumer. It has been found that the plastic staining problem encountered with the use of colorants is successfully negotiated by the presence of

the precipitated silica-aluminate compound, as utilized in instant invention.

The following examples are given for purposes of illustration only, and are not to be considered as necessarily constituting a limitation on the present invention. All parts and percentages given are by weight unless otherwise indicated. For purposes of ascertaining the capacity of the various compositions exemplified to ameliorate overglaze attack on fine china samples, the method of the Chemical Specialties Manufacturers Association (CSMA) is employed, such method being described in detail in "Soap and Chemical Specialties", 33, (9), 60, 1957. Such test is designed as an accelerated dishwasher exposure method; thus, the comparative removal of overglaze decoration provides direct means for affording an evaluation of the corrosiveness of dishwashing detergent solutions. According to such method, samples of standard plates (Greenwood pattern), Onondaga Pottery Company, Syracuse, N. Y., are immersed in deionized or distilled water maintained at a temperature of 211°F. and containing the indicated percent concentration of detergent for periods of 2, 4, and 6 hours. The test samples are thereafter removed, hand-rubbed with cloth and compared with untreated samples of the same standard plate. The treated samples are visually scrutinized to determine the extent of overglaze damage with numerical indicies being assigned to indicate the extent of overglaze damage involved. Thus, the scale of 0, 1, 2, 3 and 4 correspond, in terms of damage, to none, slight, moderate, considerable, and complete, respectively.

EXAMPLE 1

This example illustrates the applicability of the present invention to the preparation and use of cleaning compositions specifically adapted for use in connection with dishwashing operations. The following composition is prepared by dry-blending the specified ingredients to form a dry, non-caking, particulate composition.

Ingredients	%
Sodium tripolyphosphate hexahydrate	41.098
Sodium tripolyphosphate anhydrous	10.870
Sodium metasilicate, anhydrous	9.000
Sodium chloride	24.868
Non-ionic detergent*	2.000
Sodium acid aluminum phosphate	1.000
Color solution	0.228
Perfume	0.150
Potassium dichloroisocyanurate	3.000
Zeolex 23A**	5.000
Boric oxide	1.000
Boric acid	1.786

*The non-ionic detergent is the product obtained by the condensation of about three mole of propylene oxide with the condensation product of one mol of a mixture of essentially straight chain, primary, fatty alcohols in the C₁₀-C₁₈ range with about six mols of ethylene oxide.

**Zeolex is a precipitated sodium silico-aluminate available from the Huber Corporation, having the following physical characteristics:

	Zeolex 23A	35A
Heating Loss, 2 hours at 105°C (max.) % as packed	8.0	8.0
pH (20 gms Zeolex/80 ml water)	9.5-10.5	9.0-10.0
Bulk density, packed, lbs/cu.ft.	16-18	31-37
Density, 25°C, gms/ml	2.1	2.3
Form	Powder	Powder
G.E. Brightness, % reflectance	91-93	91-93
Mean particle diameter, millimicrons	40	72
Oil adsorption, cc oil/100 gms	105-125	60-80
Refractive index	1.55	1.55
Surface areas, B.E.T. M ² /gm	70	35

Overglaze damage evaluated according to the CSMA method, utilizing a 0.3% aqueous solution of the above composition is 1 with no evidence of plastic staining. Compositions without the Zeolox exhibit plastic staining. Another advantage noted with the use of Zeolox is the total lack of aluminum discoloration, a problem encountered with cleaning of aluminum utensils. An 0.15% aqueous solution has a pH of 10.2 and a CSMA rating of 1.

EXAMPLE 2

Example 1 is repeated, except that Zeolox 35A was substituted for 23A, yielding the same beneficial results.

EXAMPLE 3

Example 1 is repeated, except that the Zeolox content is increased to 7.5%, the sodium aluminum phosphate is omitted, and the sodium chloride is reduced to 23.368%. An 0.15% aqueous solution thereof has a pH of 9.9 and a CSMA rating of 1, and is non-staining.

EXAMPLE 4

Example 3 is repeated, except that the Zeolox content is increased to 9% and the sodium chloride content is reduced to 21.868%. An 0.15% aqueous solution thereof has a pH of 10.1 and a CSMA rating of 1, and is non-staining.

EXAMPLE 5

Example 1 is repeated, but the sodium aluminum phosphate and the boric oxide and boric acid are omitted, and the sodium chloride content adjusted accordingly. An 0.15% aqueous solution has a pH of 11.3 and a CSMA rating of 2. There is no evidence of plastic staining.

EXAMPLE 6

Example 1 is repeated, but the boric oxide and boric acid are omitted and the sodium chloride content adjusted accordingly. An 0.15% aqueous solution thereof exhibits a pH value of 11.1 and a CSMA rating of 1. No staining is evident.

EXAMPLE 7

Example 1 is repeated, but the sodium acid aluminum phosphate is omitted and the sodium chloride content adjusted accordingly. An 0.15% aqueous solution thereof has a pH value of 10.5 and a CSMA rating of 1 and stain-free.

A 0.15% aqueous solution of the control product, which contained 3% sodium acid aluminum phosphate and 2% talc (magnesium silicate), but no Zeolox, has a pH value of 10.0 and a CSMA rating of 2. Thus, it is apparent that, by replacing the talc and part or all of the sodium acid aluminum phosphate with a silico-aluminate compound, such as Zeolox, superior overglaze protection is obtainable, as well as a stain-free composition. Use of Zeolox eliminated aluminum discoloration, a problem encountered in the cleaning of aluminum utensils. An 0.15% aqueous solution has a pH of 10.2 and a CSMA rating of 1.

EXAMPLE 8

Ingredients
Sodium tripolyphosphate
hexahydrate
Sodium metasilicate,

59.850

%

anhydrous	20.000
Boric oxide	1.000
Boric acid	1.786
Zeolox 23A	4.000
Sodium sulfate	3.214
Potassium dichloroisocyanurate	1.600
Yellow dots	3.000
Green dots	1.500
Talc (magnesium silicate)	2.000
Non-ionic of Example 1	1.460
Perfume solution	0.590

EXAMPLE 9

Example 8 is repeated, except that the talc is omitted and the sodium sulfate is increased to 5.214%.

EXAMPLE 10

Ingredients	%
Sodium tripolyphosphate	
hexahydrate	41.096
Sodium tripolyphosphate	
anhydrous	10.870
Hydrous silicate (55.7% SiO ₂)	7.513
Sodium chloride	21.685
Potassium dichloroisocyanurate	3.000
Zeolox 23A	5.000
Boric oxide	1.000
Boric acid	1.786
Color	4.600
Non-ionic of Example 1	3.000
Perfume	0.150
Water	0.300

EXAMPLE 11

Ingredients	%
Sodium citrate 2H ₂ O	30
Tetrasodium ethylenedi	
aminetetra acetate	5.0
Silicated soda ash	40.0
Potassium dichloroisocyanurate	2.0
Non-ionic of Example 1	2.0
Sodium sulfate	11.0
Zeolox 35A	5.0
Sodium carbonate	5.0

All of the aforedefined products afforded superior overglaze protection to china during the washing cycle than products having no Zeolox, are non-caking and stable for a protracted period of time, and materials staining of the plastic parts of the dishwasher and/or other plastics bleaching therein.

Effective industrial bottle cleaning compositions may be provided in accordance with the present invention by merely admixing with caustic alkali whereby to provide a highly alkaline composition, preferably having a pH of about 12. Such compositions may be readily formulated in accordance with the parameters hereinbefore described.

Results similar to those described in the foregoing examples are obtained when the procedures delineated therein are repeated, but employing, in lieu of the specific non-ionic detergent identified, a variety of materials selected from non-ionic, anionic, cationic, amphoteric and zwitterionic types. Moreover, various bleaching agents hereinbefore recommended for such purposes may be readily employed to advantage.

While the detergent composition of the present invention finds most efficacious utilization in connection with the washing of the dishes and the like in automatic dishwashers, naturally the detergent may be utilized in other fashions as desired. Usually, however, the best mode of use will be in connection with automatic dishwashers which have the ability of dispensing the detergent of the present invention in one or more separate wash cycles. Accordingly, the detergent compositions of the present invention is added to the two recepta-

cles, if such are present, in an automatic dishwasher. When the dishwasher is set into operation, after the dishes have been suitably positioned therein, the automatic devices of the dishwashers permit the addition of sufficient water to produce a concentration of the detergent composition of approximately 0.30 to 0.5% by weight. The operation of the dishwasher results in treating, that is, washing of the dishes with the aqueous solution of the detergent composition. Usually, the sequence of operation in utilizing an automatic dishwasher results in one or more rinsing steps following the one or more washing cycles. In utilizing the detergent composition of the present invention, it will be noted that, even after use in considerable number of washings, there will be little or no attack on the overglaze on china or little or no attack on aluminum ware as a result of the use of the detergent composition.

Similarly, any dishwasher detergent may be utilized in accordance with this invention by including a precipitated silico-aluminate compound in its formulation.

It will be apparent that many changes and modifications of the several features described herein may be made without departing from the spirit and scope of the invention. It is therefore apparent that the foregoing description is by way of illustration of the invention, rather than limitation of the invention.

What is claimed is:

1. A free-flowing, non-staining water-soluble alkaline detergent composition capable of inhibiting overglaze attack consisting essentially of about 40-95% by weight of at least one water-soluble neutral to basic organic and/or inorganic builder salt, and at least 4% by weight of a precipitated silico-aluminate compound having a SiO_2 content of 66-77%, an Al_2O_3 content of 9-13%, and a Na_2O content of 5-6% by weight.

2. A composition in accordance with claim 1 which also includes about 0.5% by weight of a bleaching agent capable of liberating hypohalite in aqueous media.

3. A composition in accordance with claim 1, which is in the form of non-caking, granular product containing a plastic staining colorant.

4. A composition in accordance with claim 1 wherein said builder salt is sodium tripolyphosphate hexahydrate.

5. A composition in accordance with claim 1 which also includes from about 0.5% to about 5% by weight of water-soluble organic detergent selected from the group consisting of nonionic, cation, amphoteric, anionic and zwitterionic detergent.

6. A composition in accordance with claim 5 wherein said detergent is low-foaming nonionic detergent.

7. A composition in accordance with claim 6 wherein said detergent is the product obtained by the condensation of about 3 moles of propylene oxide with the condensation product of one mol of a mixture of essentially straight chain C_{10} - C_{18} primary, fatty alcohols with about 6 moles of ethylene oxide.

8. A method for treating glasses, dishes and like glazed surfaces to remove foreign bodies from the surfaces thereof without modifying the substrate comprising treating said substrate with a dilute aqueous solution of the composition defined in claim 1.

9. A method of cleaning fine china and aluminum ware by washing with an aqueous solution of the composition defined by claim 6.

10. A method of safely cleaning fine china and aluminum ware by washing with an aqueous solution of the composition defined in claim 3 without staining the plastic.

11. A method in accordance with claim 8, which also includes a rinsing step.

12. A composition in accordance with claim 2 wherein said bleaching agent is potassium dichloroisocyanurate.

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