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DETERGENT COMPOSITION

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This invention relates to a new composition of matter for use as a cleansing agent or detergent.

Numerous cleansing agents are known containing various detergents including alkalies. For example, the following mixtures of materials have been proposed for use as cleansing agents:

a. A mixture containing sodium carbonate, tetrasodium pyrophosphate, sodium perborate and soap.

b. A mixture containing sodium carbonate, trisodium phosphate, Turkey-red oil and tetra-hydronaphthalene sulfonate of sodium.

c. A mixture of tetrasodium pyrophosphate, trisodium phosphate, sodium metasilicate, soap and sodium perborate.

Most mixtures of cleansing compounds containing alkalies (such as the above three mixtures) which have heretofore been available on the market have been deficient in certain aspects. Some have low cleaning power; some do not rinse well; others are strongly alkaline and thus are irritating to the hands; others have the defect of being expensive.

It is an object of this invention to provide a detergent composition which has a very high degree of cleaning ability in relation to its cost and which has a relatively low alkalinity and, thus, is non-irritating to the hands. Further objects are to provide such detergent compositions which rinse well from the articles being cleaned, are readily soluble in water to give solutions of low turbidity, and to give solutions which do not suds excessively so as to interfere with the cleansing operations.

We have discovered that mixtures containing certain alkali compounds and organic detergents in specific proportions are particularly effective cleansers which may be produced at a low cost and have the other desirable characteristics of cleansers referred to above. These mixtures contain the following materials in the stated proportions in parts by weight (anhydrous basis):

	Parts by weight
Sodium carbonate	40 to 50, preferably 42 to 47
Tetrasodium pyrophosphate	25 to 33, preferably 27 to 30
Trisodium phosphate	2 to 7, preferably 4 to 5
Sodium metasilicate	2 to 7, preferably 4 to 5
Organic detergent	1 to 3, preferably 1.5 to 2

The quantity or organic detergent is stated in terms of actual organic material and does not include inorganic constituents which are frequently present in the organic detergents as purchased on the market.

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In the foregoing table the term "organic detergent" designates an organic detergent material which is substantially free from higher fatty acids and their salts. These organic detergents do not include ordinary soaps, which are characterized by containing salts of the higher fatty acids. The following are representative organic detergents suitable for incorporation in our detergent compositions, but the numerous other organic detergents free from higher fatty acids and their salts may be used: Alkyl aryl sulfonates, particularly those now marketed under the trade name "Nacconol," in which the organic detergent constituents are sodium salts of alkyl benzene sulfonates in which the alkyl group contains from 12 to 18 carbon atoms; organic nitrosation-sulfitation products, particularly those of the type disclosed in U. S. P. 2,265,993 which issued December 16, 1941, to Leland J. Beckham; aromatic monosodium sulfonates, for example, the product now marketed under the trade name "Ultrawet."

In addiiton to the aforedescribed constituents, the detergent compositions of our invention may contain moisture, coloring-matter, inert ingredients, impurities, etc. or they may contain other additional materials, as desired.

The ingredients used in making the mixtures may be supplied as the anhydrous materials or as hydrates. It is preferred to employ commercial anhydrous sodium carbonate (soda ash), anhydrous tetrasodium pyrophosphate, hydrated trisodium phosphate, hydrated sodium metasilicate, and the organic detergents in the form in which they are supplied to the market as relatively dry solids.

Our composition may be made by mixing the ingredients in any suitable manner, for example, by mixing them in the dry state in equipment such as is commonly used for mixing dry solids. Some of the ingredients may be mixed in the dry state, the mixture sprayed with water or a solution of one or more of the other ingredients, and the remaining ingredients incorporated as solids in the mixture. After mixing all of the ingredients, the resulting material may be allowed to stand for a suitably long period of time so that after screening to obtain a desired particle size, the product is relatively non-caking. The following example will more particularly illustrate this latter method of preparing the detergent compositions of this invention:

Light soda ash (470 pounds), commercial hydrated trisodium phosphate (100 pounds), and

commercial hydrated sodium metasilicate (80 pounds) are first mixed together. 50 pounds of a commercial organic detergent sold under the trade name Nacconol NRNO (a material containing the sodium salts of alkyl aryl sulfonates) are mixed with 100 pounds of water to form a slurry which is sprayed on the mixture of the foregoing solids while continuing the mixing operation. After addition of this slurry, anhydrous tetrasodium pyrophosphate (300 pounds) is added while the mixing operation is continued. After thorough mixing, the material is discharged from the mixer, cured by holding it 24 hours or longer at a temperature of 35° to 45° C. and then screened and packed. After curing, in the course of which the mixture loses some water, the product of this example contains the following ingredients in substantially the indicated percent by weight:

	Percent
Sodium carbonate	45
Tetrasodium pyrophosphate	29
Trisodium phosphate	4
Sodium metasilicate	4
Organic detergent	1.7

It is preferred that the foregoing ingredients

constitute 70% to 100% by weight, and most advantageously 78.5% to 89% by weight, of the final product, the balance being water, coloring matter, inert ingredients, impurities, etc. The weight percent of these ingredients in the product will then correspond numerically to the values for proportions in parts by weight given in the first of the foregoing tables.

We claim:

1. A detergent composition comprising (by weight) 40 to 50 parts sodium carbonate, 25 to 33 parts tetrasodium pyrophosphate, 2 to 7 parts trisodium phosphate, 2 to 7 parts sodium metasilicate, and 1 to 3 parts of a water-soluble, solid organic sulfonate detergent.

2. A detergent composition comprising (by weight) 40 to 50 parts sodium carbonate, 25 to 33 parts tetrasodium pyrophosphate, 2 to 7 parts trisodium phosphate, 2 to 7 parts sodium metasilicate, and 1 to 3 parts of a water-soluble, solid alkyl aryl sulfonate detergent.

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