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3,650,962

WASHING, BLEACHING AND CLEANSING AGENTS CONTAINING POLY-(N-ACETIC ACID)-ETHYLENEIMINES

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3 Claims

ABSTRACT OF THE DISCLOSURE

A washing, bleaching and cleansing agent having a content of from 50% to 99.9%, by weight, of customary components of washing, bleaching and cleansing agents and from 0.1% to 50%, by weight, of a polyethyleneimine selected from the group consisting of (1) branched poly-(N-acetic acid)-polyethyleneimines having an average molecular weight of from 2,000 to 200,000 wherein from about 50% to 100% of the primary and secondary amine groups in the polyethyleneimine molecule are carboxymethylated and (2) their alkali metal, ammonium and organic ammonium salts.

THE PRIOR ART

It has been common in the prior art to add to washing and cleansing agents, particularly those which contain bleaching compounds having active oxygen, complexing aminopolycarboxylic acids or their alkali salts, such as, nitrilotriacetic acid (NTA), ethylenediamine tetraacetic acid (EDTA), or diethylenetriamine pentaacetic acid (DTPA), in order to increase the stability of the bleaching agent, or to protect the optical brighteners contained in the detergents against an attack by the oxidizing agents. These compounds have, however, certain disadvantages. NTA can protect the optical brighteners only insufficiently from an oxidizing attack, while EDTA and DTPA are not completely stable against oxidizing agents and are oxidized to inactive compounds. The compounds named indeed increase the cleaning properties of washing agents. They are, however, in this respect inferior to the known inorganic builders, particularly to the polymeric phosphates.

In the German Auslegeschrift 1,060,849, as stabilizing agents for perborates or for washing and bleaching agents containing perborates are suggested, in addition to DTPA, also such complexing agents as are obtained by the reaction of ethylene chloride with ammonia and a subsequent carboxymethylation of the resulting polyamines. This reference teaches that the carboxymethylation products of the polyamine should contain up to 11 ethyleneimine groups which corresponds to a maximum molecular weight of 1220. Contrary to the assertion in the German Auslegeschrift 1,060,849, these complexing agents are also quickly oxidized by peroxide compounds and also their cleaning properties in the washing agents is lower than that of EDTA.

OBJECTS OF THE INVENTION

An object of the present invention is the obtaining of washing, bleaching and cleansing agents which have incorporated therein complexing aminopolycarboxylic acids or their salts which increase the stability and cleaning properties of the washing agents and stabilize the optical brighteners present.

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Another object of the invention is the obtaining of a washing, bleaching and cleansing agent having a content of from 50% to 99.9%, by weight, of customary components of washing, bleaching and cleansing agents and from 0.1% to 50%, by weight, of a polyethyleneimine selected from the group consisting of (1) branched poly-(N-acetic acid)-polyethyleneimines having an average molecular weight of from 2,000 to 200,000 wherein from about 50% to 100% of the primary and secondary amine groups in the polyethyleneimine molecule are carboxymethylated and (2) their alkali metal, ammonium and organic ammonium salts.

These and other objects of the invention will become more apparent as the description thereof proceeds.

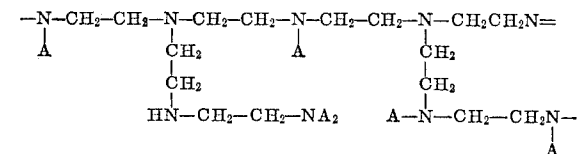
DESCRIPTION OF THE INVENTION

It has now been discovered that complexing aminopolycarboxylic acids or their salts of branched poly-(N-acetic acid)-ethyleneimine having an average molecular weight of from 2,000 to 200,000 wherein from about 50% to 100% of the primary and secondary amine groups in the polyethyleneimine molecule are carboxymethylated are complexing compounds for washing, bleaching and cleansing agents which, incorporated in said agents, are distinguished by a good stability against oxidizing substances, by an improved cleaning property, and by an effective stabilizing of the optical brighteners.

The invention therefore comprises a washing, bleaching and cleansing agent having a content of from 50% to 99.9%, by weight, of customary components of washing, bleaching and cleansing agents and from 0.1% to 50%, by weight, of a polyethyleneimine selected from the group consisting of (1) branched poly-(N-acetic acid)-polyethyleneimines having an average molecular weight of from 2,000 to 200,000 wherein from about 50% to 100% of the primary and secondary amine groups in the polyethyleneimine molecule are carboxymethylated and (2) their alkali metal, ammonium and organic ammonium salts.

The preparation of the branched polymeric-N-acetic acid-ethyleneimines is executed according to known procedures, for example, by reacting branched polyethyleneimines of an average molecular weight of 1200 to 120,000 in an aqueous alkaline medium with alkali metal salts of chloroacetic or bromoacetic acid. By treatment with ion-exchange resins, the alkali metal salts obtained are converted to the free acids or, by subsequent neutralization with ammonia or organic ammonia bases, such as mono-, di-, and triethanolamine, morpholine and N-methylmorpholine, to the corresponding ammonium salts.

The molecular structure of the branched poly-(N-acetic acid)-ethyleneimines is partially illustrated as follows:



where A represents the CH₂-COOH radical. According to the degree of alkylation the polymers can also contain unsubstituted primary or secondary amine groups. In products with a high degree of alkylation also quaternary ammonium groups can be present. For the use according to the invention primarily such products are suitable in which the primary and secondary amine groups contained in the starting material are carboxymethylated to from about 50% to 100%, preferably from 60% to 98%.

The cleaning properties of the polymers increase with increasing molecular weight and, therefore, such polymers are preferably used which have an average mo-

molecular weight of at least 4000, for example, 4000 to 150,000.

The polymeric N-acetic-acid-ethyleneimines can be added to the washing, bleaching, and cleansing agents in forms of salts or the free acid, if in the latter case, the substrate contains sufficient amounts of alkaline reacting compounds so that on dissolving the agents in water a neutralization of the free acid groups takes place.

The agents according to the invention contain at least one other cleaning or bleaching component, such as non-ionic, anionic and amphoteric surface-active materials, inorganic or organic builders, oxygen-containing bleaching agents, as well as other conventional washing and cleansing ingredients.

Among the surface-active materials present as a component in the washing, bleaching and cleansing agents of the invention are, in the case where little foaming is essential, nonionic compounds, such as the polyalkylene-glycolether derivatives of alcohols, fatty acids and alkylphenols which contain 3 to 30 alkylenglycolether groups and 8 to 20 carbon atoms in the hydrocarbon radical. Particularly suitable are polyalkylenglycolether derivatives in which the number of oxyethylene groups is from 5 to 15 and whose hydrocarbon radicals are derived from straight-chain primary alcohols with 12 to 18 carbon atoms, or from alkylphenols with a straight-chain alkyl chain of 6 to 14 carbon atoms. By the addition of 3 to 15 mols of propylene oxide to the last-named polyethylene-glycolethers, or by converting them into acetals, detergents are obtained which are distinguished by a specially low foaming power.

Other suitable nonionic basic washing components are the water soluble polyethylene oxide adducts, adducted to polypropyleneglycol, ethylenediamine-polypropyleneglycol and alkylpolypropyleneglycol with 1 to 10 carbon atoms in the alkyl chain. Preferably, these adducts contain from 20 to 250 oxyethylene groups and 10 to 100 oxypropylene groups in the molecule. The named compounds contain usually 1 to 5 oxyethylene units per oxypropylene unit. Also nonionic compounds of the type of amino oxides and sulfoxides which, if necessary, can also be ethoxylated, are usable.

The washing and cleansing agents can also contain anionic basic washing components of the sulfonate or sulfate type. Primarily alkylbenzene sulfonates, such as dodecylbenzene sulfonate are suitable. However, olefin sulfonates, such as, are obtained by sulfonation of primary and secondary aliphatic monoolefins with gaseous sulfur trioxide and subsequent alkaline or acidic hydrolysis, as well as alkylsulfonates obtainable from n-alkanes by sulfochlorination or sulfoxidation and subsequent hydrolysis, or neutralization, or by addition of bisulfite to olefins are also suitable. Also α -sulfo fatty acid esters, primary and secondary alkyl sulfates and the sulfates of ethoxylated or propoxylated higher alcohols are suitable. Other compounds of this class which can be occasionally present in the detergents are the higher molecular weight sulfated partial ethers and partial esters of polyhydric alcohols, such as, the alkali metal salts of the monoalkyl ethers, or mono-fatty acid esters of the glycerine mono-sulfuric acid esters, or, of 1,2 dihydroxypropane-sulfonic acid. Also sulfates of ethoxylated or propoxylated fatty acid amides and alkyl phenols as well as fatty acid taurides and fatty acid isethionates are suitable.

Other appropriate anionic basic washing components are alkali metal soaps of natural or synthetic fatty acids, such as, sodium soaps of coconut, palm kernel, or tallow fatty acids. As amphoteric basic washing components, alkylbetaines and, particularly, alkylsulfobetaines are suitable, for example, 3-(N,N-dimethyl-N-alkylammonium)-propane-1-sulfonate and 3-(N,N-dimethyl-N-alkyl-ammonium)-2-hydroxypropane-1-sulfonate, preferably where alkyl is a lower alkyl such as methyl or ethyl.

The anionic basic washing components can be present in the form of the alkali metal salts such as the sodium

and potassium salts as well as the ammonium salt, or as salts of organic bases, such as mono, di, and triethanol-amine. Where the named surface-active nonionic, anionic and amphoteric compounds have a long-chain aliphatic hydrocarbon radical, the latter should preferably be straight-chained and should have from 8 to 22 carbon atoms. In the compounds with araliphatic hydrocarbon radicals the preferred straight alkyl chains contain an average of from 6 to 16 carbon atoms.

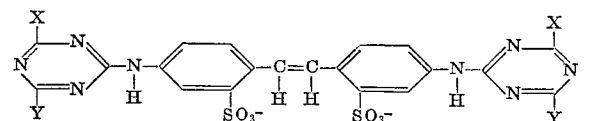
Appropriate mixture ingredients in addition to the above are also inorganic builders, particularly condensed phosphates, such as, pyrophosphates, triphosphates, tetraphosphates, trimetaphosphates, tetrametaphosphates as well as more highly condensed phosphates in the form of the neutral or acidic alkali metal salts such as the sodium and potassium salts as well as the ammonium salt. Preferably alkali metal triphosphates and their mixture with pyrophosphates are used. The condensed phosphates can also be partly or completely substituted by organic complexing agents containing phosphorus or nitrogen atoms. Such compounds are the alkali metal or ammonium salts of aminopolyphosphonic acids, particularly aminotri-(methylenephosphonic acid), 1-hydroxyethane-1,1-diphosphonic acid, methylene diphosphonic acid, ethylene diphosphonic acid as well as the higher homologs of the named polyphosphonic acids, as well as the alkali metal or ammonium salts of low-molecular-weight aminopolycarboxylic acids, such as NTA and EDTA. As other builders, alkali metal silicates are suitable, particularly sodium silicate in which the ratio $\text{Na}_2\text{O}:\text{SiO}_2$ is 1:3.5 to 1:1.

As further mixture ingredients are neutral salts, such as, sodium sulfate and sodium chloride, as well as compounds for adjustment of the pH, such as bicarbonates, carbonates, borates and hydroxides of sodium and potassium and acids, such as, lactic and citric acid. The amount of the alkaline reacting substances should be calculated so that the pH of a serviceable washing liquor for coarse laundry is 9 to 12 and for fine laundry 6 to 9.

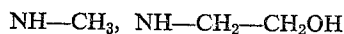
By appropriate combination of various surface-active basic washing components or builders with each other, in many cases increased effectiveness, such as a higher cleaning property or lower foaming power can be attained. Such improvements are possible, for example, by combination together of anionic with nonionic and/or amphoteric compounds, by combination of various non-ionic compounds with each other or also by mixtures of basic washing components of the same type which differ in regard to the number of carbon atoms or the number and position of double bonds or branched chains in the hydrocarbon. Synergistically effective mixtures of inorganic and organic builders can also be used or combined with the precedingly named mixtures.

Depending upon their respective use, the washing agents of the invention can contain oxygen-releasing bleaching compounds, such as, hydrogen peroxide, alkali metal perborates, alkali metal percarbonates, alkali metal perphosphates, urea hydrogen peroxide and alkali metal persulfates or active-chlorine compounds, such as, alkali metal hypochlorites, chlorinated trisodium phosphate and chlorinated cyanuric acid, or its alkali metal salts. The peroxide compounds can be present in a mixture with bleaching activators and stabilizers, such as, magnesium silicate.

Optical brighteners suitable for cellulosic fibers used in the washing agents of the invention are those of the diaminostilbene disulfonic acid type of the formula:



in which X and Y have the following meanings: NH_2 ,



- 0.2% to 5% of foam inhibitors from the class of trialkylmelamines and saturated fatty acids with 20 to 24 carbon atoms, or their alkali metal soaps.
 10% to 50% of a condensed alkali metal phosphate from the class of the pyrophosphates or the tripolyphosphates.
 0.1% to 25% of poly-(N-acetic acid)-ethyleneimine or its alkali metal salt
 1% to 5% of sodium silicate
 10% to 35% of sodium perborate tetrahydrate
 0 to 5% of enzymes
 0.05% to 1% of at least one optical brightener from the class of diaminostilbenedisulfonic acid or diarylpyrazoline derivatives
 0.1% to 30% of an inorganic alkali metal salt from the class of the carbonates, bicarbonates, borates, sulfates and chlorides.
 0 to 4% of magnesium silicate
 0.5% to 3% of sodium celluloseglycolate

(B) Powdery foaming fine washing agent

- 1% to 30% of a sulfonate basic washing component (sodium salt)
 0.5% to 10% of alkylpolyglycoether sulfate (alkyl C₈ to C₁₆, 1 to 5 oxyethylene groups)
 0 to 20% of an alkylpolyglycoether (alkyl C₁₀ to C₁₈) or alkylphenolpolyglycoether (alkyl C₈ to C₁₂), with 5 to 12 oxyethylene groups
 0.2% to 25% of poly-(N-acetic acid)-ethyleneimine or its alkali metal salt
 0 to 5% of a higher fatty acid ethanalamide or diethanalamide
 0 to 20% of sodium tripolyphosphate
 0 to 1% of a brightener from the class of the diarylpyrazoline derivatives and its mixtures with polyester brighteners.
 3% to 70% of sodium sulfate

(C) Liquid washing agent

- 0.5% to 10% of a sulfonate basic washing component (potassium salt)
 0 to 10% of alkylpolyglycoether sulfate (alkyl C₈ to C₁₆, 1 to 5 oxyethylene groups)
 0.2% to 25% of poly-(N-acetic acid)-ethyleneimine or its alkali metal salts
 0.1% to 5% of fatty amide-glycoether condensate (alkyl C₁₀ to C₁₈, 1 to 10 oxyethylene groups)
 1% to 10% of solution aids from the class of the alkali metal salts of benzene, toluene, or xylene sulfonic acids.
 0 to 30% of neutral or acid potassium pyrophosphate
 0 to 10% of organic solvent media from the class of the C₂ to C₃ alcohols and ether alcohols
 0 to 1% of optical brighteners from the class of the diaminostilbene disulfonic acids and diarylpyrazoline derivatives
 Residue: Water, perfumes, dyes, preservatives

(D) Steeping and pre-washing agent

- 0.5% to 5% of sulfonate basic washing component (sodium salt)
 0 to 3% of compounds from the class of alkylpolyglycol ethers (alkyl C₁₂ to C₁₈) and alkylphenolpolyglycol ethers (alkyl C₈ to C₁₂) with 5 to 12 oxyethylene groups
 0.1% to 10% of poly-(N-acetic acid)-ethyleneimine or its alkali metal salts
 10% to 50% of sodium carbonate
 1% to 5% of water glass
 0 to 5% of magnesium silicate
 0 to 5% of enzymes

(E) Dishwashing-machine washing agents

- 0.1% to 3% of compounds from the class of the alkylpolyglycoether (alkyl C₁₂ to C₁₈), alkylphenolpolyglycoether (alkyl C₈ to C₁₄) with 5 to 30 oxyethylene groups, and 5 to 30 oxypropylene groups, and ethoxylated polypropyleneglycols.

- 0.2% to 25% of poly-(N-acetic acid)-ethyleneimine or its alkali metal salts
 45% to 95% of pentasodium triphosphate
 1% to 40% of sodium silicate (Na₂O:SiO₂=1:1 to 1:3)
 0 to 5% of potassium dichloroisocyanurate
 0 to 2% of foaming inhibitors

(F) Liquid rinsing and cleansing agent

- 5% to 30% of a sulfonate basic washing component (potassium salt)
 2% to 15% of alkylpolyglycoether sulfate (alkyl C₈ to C₁₆, 1 to 5 oxyethylene groups)
 0.2% to 10% of alkali metal salts of poly-(N-acetic acid)-ethyleneimine
 0 to 20% of organic solvents from the class of C₂ to C₃ alcohols and ether alcohols
 1% to 10% of solution aids such as sodium toluene sulfonate, sodium xylene sulfonate and urea
 Residue: Water, perfumes, dyes, preservatives

(G) Bleaching agents

- 0.2% to 25% of poly-(N-acetic acid)-ethyleneimine or its alkali metal salts
 10% to 95% of percompounds
 0 to 50% of alkaline reacting compounds from the class of alkali metal hydroxides, carbonate, silicates and phosphates.
 0 to 50% of bleaching activators
 0 to 5% of anionic and/or nonionic detergents
 0 to 10% of other ingredients, such as, corrosion inhibitors, optical brighteners, neutral salts, magnesium silicate.

(H) Alkaline cleansers

- 0.1% to 25% of poly-(N-acetic acid)-ethyleneimine or its alkali metal salts
 0.5% to 50% of sodium silicate (Na₂O:SiO₂=1:1 to 1:3)
 0.5% to 80% of sodium hydroxide
 0 to 40% of trisodium phosphate
 0 to 40% of condensed alkali metal phosphates
 0 to 40% of sodium carbonate
 0 to 10% of hydroxyethane diphosphonate (sodium salts)
 0 to 5% of anionic and/or nonionic detergents

(I) Scouring agent

- 1% to 10% of anionic and/or nonionic basic washing components
 0.1% to 5% of alkali metal salts of poly-(N-acetic acid)-ethyleneimine
 80% to 95% of abrasive agents
 0 to 10% of cleansing salts of the class of alkali metal polyphosphates, alkali metal silicates, alkali metal borates, and alkali metal carbonates
 0 to 10% of alkali metal dichloroisocyanurate

EXAMPLES 1 TO 3

- The cleaning action of washing agents that contained one part by weight of an anionic basic washing component (Na-n-dodecylbenzene sulfonate) and two parts by weight of builders components were compared. With these washing agents gray cotton cloth which had been soiled with a synthetic soil containing soot, iron oxide and cutaneous fat was washed in a laboratory washing machine where the washing liquor was heated from 20° C. to 90° C. within 15 minutes and kept at 90° C. for another 15 minutes. The washing agent concentration was 3 gm./l. The water hardness was 16° dH. The weight ration of textile to liquor was 1:12. Subsequently, the washed cloth was rinsed with water four times, centrifuged and dried. The percent of whiteness was determined with a photometer (soiled cloth 0%, original cloth 100%) and is shown in the following table as well as the composition of the washing agents. For the preparation of the branched poly-(N-acetic acid)-ethyleneimine, branched polyamines of average molecular weights of 2,500, 5,000 and 70,000 were heated to 80° to 90° C. in a 20% aqueous solution each time with 80% of

the stoichiometric amount, required for a complete carboxymethylation, of sodium chloroacetate. The pH of the solution was kept constant at a value between 10 to 11 by the addition of 5 N NaOH. On treating with anionic and cationic exchange resins, the reaction products were desalted or converted to the free acid and subsequently neutralized with sodium hydroxide.

The results of the washing tests show that the polymeric N-acetic acid ethyleneimines are superior to the other known builders, among them the pentasodium triphosphate which is known as being very effective, in the cleaning property.

TABLE I

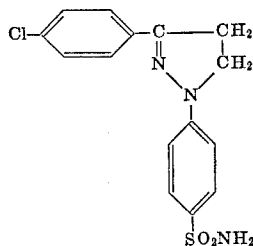
Example	Builders	Average molecular weight	Percent Brightening
1	Sodium salts of branched poly-(N-acetic acid)-ethyleneimines.	5,000	73.0
2	do	10,000	73.3
3	do	140,000	74.0
	Pentasodium triphosphate		72.7
	Na-ethylenediamine tetraacetate		72.0
	Na salt of a carboxymethylated polyamine according to DAS 1,060,849.	900	67.2

EXAMPLES 4 TO 6

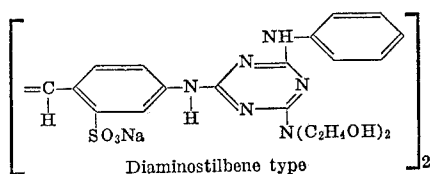
A washing agent of the following composition was used (data in percent by weight):

- 8% Na n-dodecylbenzene sulfonate
- 5% sodium soap of C₁₂ to C₂₂ fatty acids
- 3% oleyl alcohol polyethyleneglycolether (10 oxyethylene groups)
- 40% pentasodium triphosphate
- 5% sodium silicate (Na₂O.3.3 SiO₂)
- 2% magnesium silicate
- 1% sodium cellulose glycolate
- 25% sodium perborate-tetrahydrate
- 8% water
- 0.8% brightener of the pyrazoline type
- 0.2% brightener of the diaminostilbene type

The brighteners had the following structures:



Pyrazoline type



Diaminostilbene type

To this agent were added each time 2% by weight of the sodium salt of a branched poly-(N-acetic acid)-ethyleneimine which had in Example 4 an average molecular weight of 5,000, in Example 5 of 10,000, and in Example 6 of 140,000. For comparative purposes, a washing agent was used which, instead of the polymers according to the invention, 2% of sodium nitrilotriacetate (NTA) or 2% of Na-ethylenediamine tetraacetate (EDTA) was added. With these agents, textiles of polyamide fiber (Perlon, 75

registered trademark) were washed in a laboratory washing machine where the washing liquor was heated from 20° C. to 60° C. within 15 minutes and was kept at this temperature for additional 15 minutes. The washing agent concentration was 5 gm./l. and the weight ratio of textiles to liquor was 1:30. The water used had a hardness of 16° dH as well as a copper ion content of 10⁻⁵ mols per liter. The degree of whiteness of the four times rinsed and then dried wash was determined by photometer. The results are summarized in the following Table II. This shows the superiority of the compounds used according to the invention.

TABLE II

Example	Molecular weight	Degree of whiteness after—	
		1 washing	5 washings
4	5,000	105	112
5	10,000	106	115
6	140,000	107	115
	Na-nitrilo triacetate	100	104
	Na-ethylenediamine tetraacetate	103	110

EXAMPLES 7 AND 8

An aqueous solution containing 0.62 gm./l. sodium perborate was prepared from a bleaching agent consisting of 154 gm. of sodium perborate and of 124 gm. of the sodium salt of poly-(N-acetic acid)-ethyleneimine of

Example 7, a molecular weight ----- 4,200
Example 8, a molecular weight ----- 15,000

prepared by reacting a branched polyethyleneimine with chloroacetic acid (1 mol of chloroacetic acid per ethyleneimine unit). The pH of the solution was adjusted to 10 by addition of dilute sodium hydroxide. The decrease of the active-oxygen content of this solution at 90° C. was determined every 30 minutes by iodometric titration. For comparison the determination was repeated with equal amounts of known perborate stabilizers. The results are summarized in the following Table III. This shows the superiority of the agents according to the invention.

TABLE III

Example	Stabilizer	Molecular weight	Percent active oxygen after (minutes)—				
			30	60	90	120	150
7	Poly-(N-acetic acid)-ethyleneimine.	4,200	73	56	40	24	15
8	do	15,000	75	60	43	29	21
	EDTA (sodium salt)		52	26	10	3	-----
	DTPA (sodium salt)		40	15	5	2	-----
	Carboxymethylated polyamine according to DAS 1,060,840 (sodium salt)	900	48	22	9	5	-----
	Without addition		35	18	8	4	-----

In the following Table IV are summarized some recipes of washing, bleaching and cleansing agents according to the invention for the following fields of application:

- Example 9—foam-suppressing heavy washing agent
- Example 10—cold-washing agent
- Example 11—liquid washing agent
- Example 12—wool-washing agent
- Example 13—steeping agent
- Example 14—bleaching agent
- Example 15—liquid dish-rinsing agent
- Example 16—cleanser for heavy soiling
- Example 17—scouring agent

The ingredients a to d and f to i were present as the sodium salts, the pyrophosphate (ingredient k) was used

in Example 9 as the potassium salt, and in all other examples as sodium salt. As enzyme (ingredient q), a preparation "Maxatase" (registered trademark), made from *Bacillus subtilis*, with an activity of 100,000 LVA/gm. was utilized. The foam suppressor (ingredient v) is a reaction product of 1 mol cyanuric chloride with 2.7 mols of a primary n-alkylamine with a C₈ to C₁₈ chain length.

TABLE IV

Ingredient	Examples (data in weight percent)									
	9	10	11	12	13	14	15	16	17	
(a) n-dodecylbenzene sulfonate	6		5	15			15		2.5	
(b) C ₁₂ -C ₁₈ -olefin sulfonate	3				3.5					
(c) C ₁₄ -C ₁₇ -alkane sulfonate		10	5			0.5	5			
(d) Coconut alcohol glycol ether sulfate (2 EO)		2.3	5	10				4		
(e) Oleyl alcohol polyglycoether (10 EO)	3	4		5					1	
(f) C ₁₂ -C ₁₈ soap	2								2	
(g) C ₂₀ -C ₂₂ soap	1									
(h) Poly-(N-acetic acid)-ethyleneimine	25	15	1	5.5	0.2	1.5	1	0.5	0.2	
(i) Tripolyphosphate	10	20	20					10		
(k) Pyrophosphate					20			2		
(l) Sodium carbonate		20			35	25		45	5	
(m) Sodium silicate		5	5		5	20		25	1	
(n) Sodium sulfate	4.4			45	18		0.4		1.2	
(o) Sodium perborate	25					50				
(p) Magnesium silicate	3				3					
(q) Enzyme	1.5				2					
(r) Na-celluloseglycolate	1.5									
(s) Na-toluene sulfonate			7							
(t) Coconut fatty acid diethanolamide				5			4.5			
(u) Optical brightener	0.5	0.7	0.1			0.5				
(v) Foaming suppressor	0.5									
(w) Water	8.5	7.9	56.7	14.5	13.3	2.5	70	13.4		
(x) Dichloroisocyanurate		15						1	4	
(y) Coloring and odorizing agents	0.1	0.1	0.2				0.1	0.1	0.1	
(z) Quartz powder										86

NOTE.—EO=oxyethylene units.

The preceding specific embodiments are illustrative of the practice of the invention. It is to be understood, however, that other expedients known to those skilled in the art may be employed without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. A washing, bleaching and cleansing agent having a content of from 50% to 99.9%, by weight, of customary components of washing, bleaching and cleansing agents and from 0.1% to 50%, by weight, of a polyethyleneimine selected from the group consisting of (1) branched poly-(N-acetic acid)-polyethyleneimines having an average molecular weight of from 2,000 to 200,000 wherein from about 50% to 100% of the primary and secondary amine groups in the polyethyleneimine molecule are carboxymethylated and (2) their alkali metal, ammonium and organic ammonium salts with bases selected from the group consisting of mono-, di- and triethanolamine, morpholine and N-methyl morpholine, said customary components of washing, bleaching and cleansing agents consisting essentially of from 1% to 40% by weight of at least one compound selected from the group consisting of anionic, non-ionic and amphoteric surface-active basic washing components, from 0% to 80% by weight of at least one builder selected from the group consisting of condensed inorganic phosphate builders, alkali metal silicates, carbonates, bicarbonates, borates, sulfates and chlorides, alkali metal and ammonium salts of aminopolyphosphonic acids and low-molecular-weight aminopoly-

carboxylic acids, from 0% to 50% by weight of a bleaching compound selected from the group consisting of hydrogen peroxide, urea hydrogen peroxide, alkali metal perborates, percarbonates, perphosphates, persulfates, hypochlorites, chlorinated trisodium phosphate and chlorinated cyanuric acid and its alkali metal salts, and mixtures thereof with magnesium silicates, and from 0% to

60% of other auxiliary and supplementary components of washing agents selected from the group consisting of optical brighteners, greying-inhibitors, foam-suppressors, enzymes, water-miscible solvents, water and dissolving aids, said ingredients totalling 100% by weight of said customary components.

2. The washing, bleaching and cleansing agent of claim 1 wherein said polyethyleneimine is present in an amount of from 0.5% to 25% by weight.

3. The washing, bleaching and cleansing agent of claim 1 wherein said branched poly-(N-acetic acid)-polyethyleneimine has an average molecular weight of from 4000 to 150,000 and from 60% to 98% of the primary and secondary amine groups in the polyethyleneimine molecule are carboxymethylated.

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