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54 **Alkaline cleaning compositions.**

57 A cleaning composition, particularly for cleaning industrial ovens, contains an aqueous base, from 1% to 6% of a nonionic surfactant such as a polyoxyalkylene alkyl ether, from 1% to 40% of an alkali such as caustic soda and from 5% to 20% of a solvent such as a glycol ether. Hydrotropes, such as sodium xylene sulphonate and thickeners such as hydroxyethyl cellulose may also be present.

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ALKALINE CLEANING COMPOSITIONS

The present invention relates to alkaline cleaning compositions, particularly aqueous alkaline compositions adapted for use in non-aerosol form and suitable for cleaning hard surfaces such as ovens and the like.

5 It is known from British Patent Specification 1 297 782 to use, as oven cleaning compositions, aqueous alkali compositions which contain caustic alkali, an alkali-stable organic detergent active compound, and an aliphatic monohydric alcohol and which are adapted for use in
10 aerosol form. It is also known from United States Patent Sepcification 3 829 387 to use, as an aerosol oven cleaning composition, an aqueous alkali composition containing caustic alkali, a glycol ether and a non-ionic detergent active compound.

15 We have now surprisingly discovered that particularly good cleaning results can be achieved with a cleaning composition comprising an aqueous base containing:

- (i) from about 1% to about 6% by weight of a non-ionic surfactant;
(ii) from about 1% to about 40% by weight of an alkali; and
(iii) from about 5% to about 20% by weight of a solvent.

5 The non-ionic surfactant is preferably a polyoxyalkylene alkyl ether such as the "Brij"-type non-ionics. Particularly suitable examples are Brij 35 (polyoxyethylene (23) lauryl ether) and Brij 78 (polyoxyethylene(20) stearyl ether). The quantity of the non-ionic surfactant may be from about
10 1.5% to 2.5%, preferably about 2% by weight.

The alkali is preferably a caustic alkali such as sodium hydroxide or potassium hydroxide. Alternatively silicates such as potassium silicate with a $K_2O:SiO_2$ weight ratio of 1:2 to 2:1. Further examples of suitable alkali
15 materials are guanidine (formed from guanidine hydrochloride and sodium hydroxide) and mono-, di- and trialkanolamines. The amount of alkali present is preferably from about 1 to about 10% by weight in the case of caustic alkalis and from about 3 to about 30% by weight in the case of an alkali
20 metal silicate. Most preferred ranges are from about 3 to 6% by weight and from about 4 to 10% by weight respectively.

The solvent is preferably a high boiling point solvent (i.e. having a boiling point over about $120^{\circ}C$). The
25 preferred solvents are: glycol ethers such as butyl cellusolve, methyl, ethyl or butyl carbitol; pentaerythritol propane 1,2-diol; propylene glycol; and dioxitol. The solvent is preferably present in the amount of from about 5% to about 15%, most preferably about 10% by weight.

30 Other ingredients may be present in the compositions of the invention. A hydrotrope may be added up to an amount of about 18% by weight, preferably from about 6% to 12% by weight. The hydrotrope may be selected from alkali metal aryl sulphonates, such as sodium xylene

5 sulphonate, the latter also aiding soil penetration by
the composition. A thickening agent may also be present,
in an amount up to about 2% by weight, preferably about
0.4% by weight. The thickening agent enables the
product to cling better to vertical surfaces and reduces
mist on spraying the neat product. Suitable thickening
agents include hydroxyethyl cellulose (Natrosol -
Registered Trade Mark), lauryl alcohol, stearyl alcohol,
magnesium sulphate, sodium carbonate and sodium chloride,
10 hydroxypropylcellulose (Klucel - Registered Trade Mark),
acrylate-methacrylate polymer (Latekoll - Registered
Trade Mark) or mixtures of these with hydroxyethyl
celluloses. The preferred amount of thickening agent
is up to about 2% by weight in the case of an organic
15 thickener, more preferably about 0.4% by weight and up to
6% by weight in the case of an inorganic thickener, more
preferably about 1 to 3% by weight.

The preferred thickener is a cellulose based
nonionic polymer especially the sterically hindered
20 natrosol types. These give much better viscosity
stability with time in these formulations.

Further optional ingredients in the cleaning com-
positions of the invention include dyes and humectants.

25 The invention will now be illustrated, purely by
way of example, with reference to the following non-
limiting examples, in which parts and percentages are
by weight, unless otherwise stated.

EXAMPLES 1 TO 4

Cleaning compositions were made up according to the following table:

TABLE I

5	EXAMPLE	1	2	3	4
	Brij 35	2.0	2.0	2.0	2.0
	Carbitol	10.0	10.0	10.0	10.0
	NaOH at 100°TW(46.5%)	11.0	11.0	-	-
	KOH at 90°TW(43.4%)	-	-	8.0	8.0
10	Potassium Silicate(34%) (K ₂ O:SiO ₂ =1:2 by wt.)	-	-	13.0	26.0
	Natrosol (1% sol ⁿ)	-	40.0	-	-
	Sodium xylene sulphonate (30% a.i.)	30.0	30.0	30.0	30.0
	Water	Balance		to 100	

15 A number of prior art formulations approximately according to the following table were prepared:

FORMULATION :	A	B	C	D	E	F	G
TRADE NAME :	Sactif Aerosol	Dip-R-Spray	Odex Gel	Rocep C12 gel	Glenvil G.C. 10.	Sumaren U.G.N.	Gel Product
Anionic	2.4		3.7	3.2			
Nonionic	0.4			2.7		1.5	6.0
NaOH	3.0				6.3		
KOH		16.2				9.7	
NH ₃			1.8	1.1			2.0
Na ₂ CO ₃			0.9				
Isopropanol			14.0				present
CH ₂ Cl ₂				30-40			
Mineral oil			4.9				4.9
Sodium Orthophosphate			0.4				
Sodium poly-phosphate						5.0	
Hydroxycarboxy methylcellulose	0.3						
Propellant	10.0						
Water			balance	to	100		

Examples 1 to 4 were compared with the prior art formulations A to G for detergency efficiency. The evaluation was based on the average base reflectance measurements (R 460*) on a number of soiled white test plates. The reflectance measurement on a clean plate was 69.7. The results were as follows:

TABLE III

	20°C 15 minute application	60 °C 5 minute application
Ex 1	59	60
Ex 2	68	87
Ex 3	17	48
Ex 4	5	19
A	0.5	22
B	5.6	84
C	1.0	25
D	14	.8
E	7	71
F	5	not tested
G	5	not tested

EXAMPLES 5 TO 13

The formulations set out in the following table were prepared.

TABLE IV

Example	5	6	7	8	9	10	11	12	13
Guanidinium Chloride	10.0	10.0	-	5.0	-	5.0	-	-	-
NaOH	4.2	-	8.4	4.2	4.2	8.4	4.2	8.4	-
Butyl cellusolve or Carbitol	10	10	10	10	10	10	10	10	-
Brij 78	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8
Potassium Metasilicate		20							30
Triethanol amine							10	10	10
Water	-----	-----	-----	balance	to	100-----	-----	-----	-----

C L A I M S

1. A cleaning composition comprising an aqueous base containing
- (i) from about 1% to about 6% by weight of a nonionic surfactant;
 - (ii) from about 1% to about 40% by weight of an alkali; and
 - (iii) from about 5% to about 20% by weight of a solvent.



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
D/X	<u>US - A - 3 829 387</u> (L.M. WISE et al.) * Abstract; column 2, lines 22-52; examples and claims * ---	1	C 11 D 1/66 3/02 3/43
D	<u>GB - A - 1 297 782</u> (UNILEVER) * Examples and claims * ---	1	
	<u>GB - A - 825 960</u> (W. PEARSON) * The whole document * ---	1	TECHNICAL FIELDS SEARCHED (Int. Cl.)
	<u>US - A - 3 839 234</u> (C.J. ROSCOE) * The whole document * ---	1	C 11 D 1/66 1/72 3/00 3/02 7/06
	<u>US - A - 4 147 652</u> (T.J. KANIECKI) * The whole document * ---	1	
	<u>GB - A - 1 311 534</u> (M.K. PAGE) * The whole document * ---	1	
	<u>US - A - 3 960 742</u> (E.O. LEONARD) * The whole document * ---	1	CATEGORY OF CITED DOCUMENTS
	<u>FR - A - 2 042 576</u> (HENKEL) * Examples and claims * -----	1	X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
The present search report has been drawn up for all claims			&: member of the same patent family. corresponding document
Place of search The Hague		Date of completion of the search 22.04.1981	Examiner GOLLER