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(54) **DETERGENT SOUS FORME SOLIDE AYANT DES PROPRIETES DE DESAGREGATION AMELIOREES**

(54) **SHAPED BODIES OF DETERGENT WITH IMPROVED DISINTEGRATION PROPERTIES**

(57) A laundry detergent or cleaning product tablet of compacted particulate laundry detergent or cleaning product, comprising surfactant(s), builder(s), and, if desired, further laundry detergent or cleaning product constituents, wherein the tablet comprises from 0.2 to 10% by weight of surfactant(s) from the group of alkyl polyglycosides and less than 5% by weight of potassium carbonate.

Abstract

A laundry detergent or cleaning product tablet of compacted particulate laundry detergent or cleaning product, comprising surfactant(s), builder(s), and, if desired, further laundry detergent or cleaning product constituents, wherein the tablet comprises from 0.2 to 10% by weight of surfactant(s) from the group of alkyl polyglycosides and less than 5% by weight of potassium carbonate.

"Shaped bodies of detergent with improved disintegration properties"

The present invention is situated in the field of compact shaped bodies which have wash-active and detersive properties. The invention relates in particular to laundry detergent and cleaning product tablets used for washing textiles in a domestic washing machine, tablets being the common term for shaped bodies of this kind.

Laundry detergent and cleaning product tablets are widely described in the prior art and are enjoying increasing polularity among users on account of the ease of dosing. Tableted laundry detergents and cleaning products have a number of advantages over their powder-form counterparts: they are easier to dose and handle and their compact structure gives advantages in storage and transport. In the patent literature as well, therefore, laundry detergent and cleaning product tablets have been comprehensively described. One problem which occurs again and again in connection with the use of wash-active and detersive tablets is the insufficient disintegration and dissolution rate of the tablets under service conditions. Since sufficiently stable tablets, i.e., dimensionally stable and fracture-resistant tablets, can be produced only by means of relatively high compressive pressures, there is severe compaction of the tablet constituents and, consequently, retarded disintegration of the tablet in the aqueous liquor, and thus excessively slow release of the active substances in the washing or cleaning operation. The retarded disintegration of the tablets has the further disadvantage that customary laundry detergent and cleaning product tablets cannot be rinsed in via the dispenser drawer of domestic washing machines, since the tablets do not break down with sufficient rapidity into secondary particles which are small enough to be rinsed out of the dispenser drawer into the washing drum.

To overcome the dichotomy between hardness, i.e., transport and handling stability, and ready disintegration of the tablets, many attempts at solutions have been developed in the prior art. One approach, which is known in particular from pharmacy and has expanded into the field of laundry detergent and cleaning product tablets, is the incorporation of certain disintegration aids, which facilitate the ingress of water or swell on ingress of water, and exert a disintegrating action by evolving gas or in some other form. Other proposed solutions from the patent literature describe the compression of premixes of specific particle sizes, the separation of individual ingredients from certain other ingredients, and the coating of individual ingredients or of the entire tablet with binders.

For instance, **EP-A-0 522 766** (Unilever) discloses tablets of a compacted, particulate laundry detergent composition comprising surfactants, builders and disintegration aids (based on cellulose, for example), at least some of the particles being coated with the disintegrant, which has both a binder effect and a disintegrating effect when the tablets are dissolved in water. This document also points to the general difficulty of producing tablets combining adequate stability with effective solubility. The particle size in the mixture to be compressed is said in this case to be above 200 µm, the intention being that the upper and lower limits of the individual particle sizes should differ from one another by no more than 700 µm.

Further documents which concern themselves with the production of laundry detergent tablets are **EP-A-0 716 144** (Unilever), which describes tablets having an external shell of water-soluble material, and **EP-A-0 711 827** (Unilever), where one ingredient is a citrate having a defined solubility.

The use of binders which may develop a disintegrating action (especially polyethylene glycol) is described in **EP-A-0 711 828** (Unilever), which describes laundry detergent tablets produced by compressing a particulate laundry detergent composition at temperatures between 28°C and the melting point of the binder material, compression always taking place at below the melting temperature. The examples of that document reveal that the tablets produced in accordance with its teaching have higher fracture strengths if compression is carried out at elevated temperature.

Laundry detergent tablets in which individual ingredients are present separately from others are described, inter alia, in **EP-A-0 481 793** (Unilever). The laundry detergent tablets disclosed in that document comprise sodium percarbonate, which is spatially separate from all other components that might affect its stability.

In none of the abovementioned documents of the prior art which deal with laundry detergent and cleaning product tablets do the tablets comprise alkyl polyglycosides. None of said documents deals with improving the solubility of laundry detergent and cleaning product tablets by the controlled use of this class of compound which has an adverse effect on the hardness or disintegration properties of the tablets.

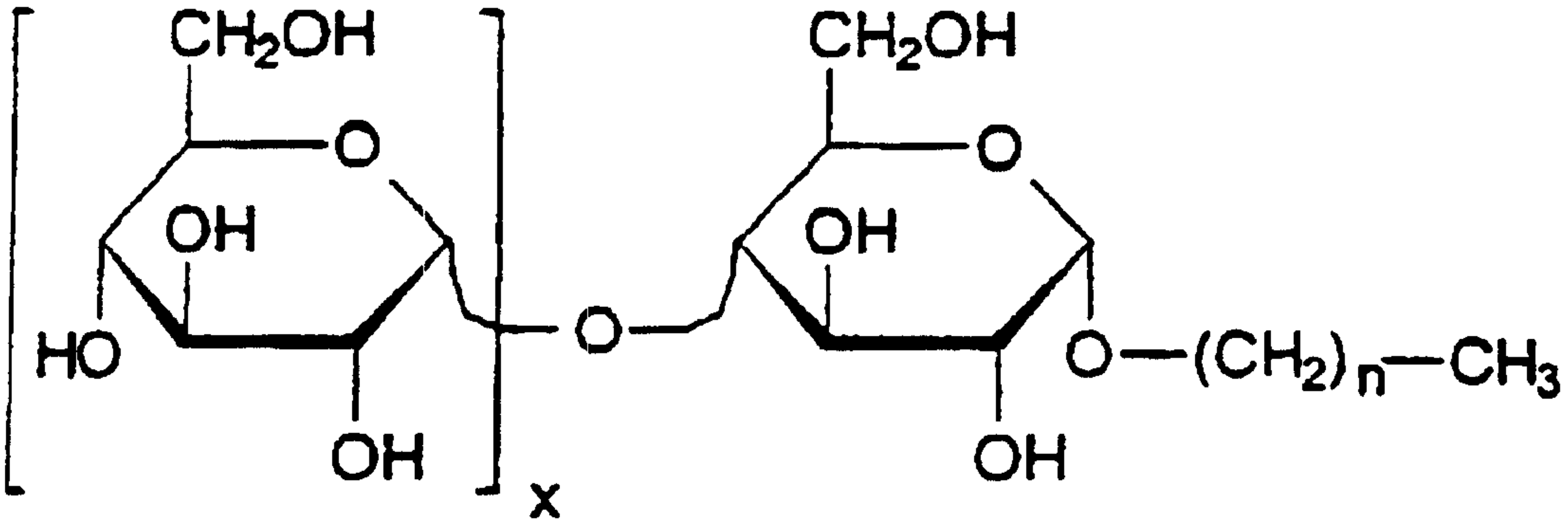
It is an object of the present invention, accordingly, to provide laundry detergent and cleaning product tablets which unite the desired properties of high hardness and mechanical stability with favorable disintegration rates.

It has now been found that laundry detergent tablets of high hardness and yet with an extremely high disintegration rate can be produced if alkyl polyglycosides are used when preparing the laundry detergent and cleaning product formulation.

The invention accordingly provides laundry detergent and cleaning product tablets of compacted particulate laundry detergent and cleaning product, comprising surfactant(s), builder(s), and, if desired, further laundry detergent and cleaning product constituents, wherein the tablets comprise surfactant(s) from the group of alkyl polyglycosides.

Alkyl polyglycosides which can be used in accordance with the invention satisfy the general formula $RO(G)_z$, where R is a linear or branched - especially methyl-branched in position 2 - saturated or unsaturated, aliphatic radical having 8 to 22, preferably 12 to 18, carbon atoms and G is the symbol for a glycose unit having 5 or 6 carbon atoms, preferably glucose. The degree of glycosidation, z, is between 1.0 and 4.0, preferably between 1.0 and 2.0, and in particular between 1.1 and 1.4.

Preference is given to the use of linear alkyl polyglucosides, i.e., alkyl polyglycosides in which the polyglycosyl radical is a glucose radical and the alkyl radical is an n-alkyl radical. These can be described by the following formula



where x is 1 less than the above-described degree of glycosidation z and thus preferred values of x are between 0 and 3, more preferably between 0 and 1, and in particular between 0.1 and 0.4. The number, n, of the methylene groups is preferably between 7 and 21, more preferably between 11 and 17, carbon atoms.

The alkyl polyglycosides used in accordance with the invention (referred to below for short as APGs) can be prepared by known processes on the basis of known raw materials. For example, dextrose is reacted in the presence of an acidic catalyst with n-butanol to give butyl polyglycoside mixtures, which are transglycosidated with long-chain alcohols, likewise in the presence of an acidic catalyst, to give the desired alkyl polyglycoside mixtures. It is also possible to glycosidate dextrose directly with the desired long-chain alcohol to give the desired alkyl polyglycoside mixtures.

The structure of the products may be varied within certain limits. The alkyl radical is determined by the selection of the long-chain alcohol. On economic grounds, preference is given to the industrially obtainable alcohols having 8 to 22 carbon atoms, especially natural alcohols from the hydrogenation of carboxylic acids or carboxylic acid derivatives. It is also possible to use the alcohols obtainable from industrial alcohol syntheses, such as oxo alcohols and Ziegler alcohols.

The polyglycosyl radicals G_y are determined on the one hand by the selection of the carbohydrate and on the other hand by the establishment of the average degree of polymerization (degree of glycosidation y), as is described, for example, in **DE 19 43 689**. In principle, as is known, it is possible to use polysaccharides, e.g., starches, maltodextrins, dextrose, galactose, mannose, xylose, etc. Preference is given to the industrially available carbohydrates starch, maltodextrin and, especially, dextrose. Since the APG syntheses of industrial interest do not proceed regioselectively and stereoselectively, the alkyl polyglycosides are always mixtures of oligomers which in turn represent mixtures of different isomeric forms. They are present alongside one another with α- and β-glycosidic linkages in pyranose form and furanose form. Even the linkage sites between two saccharide radicals are different. Alkyl polyglycosides suitable for use in accordance with the invention can also be prepared by blending alkyl polyglycosides with alkyl mono glycosides. Alkyl monoglycosides can be obtained or accumulated from alkyl polyglycosides, for example, in accordance with the process disclosed in EP 092 355, by means of polar solvents such as acetone. The degree of glycosidation of alkyl polyglycosides is normally determined by means of ^1H nuclear magnetic resonance measurements.

Laundry detergent and cleaning product tablets of the invention comprise alkyl polyglycosides, preference being given to APG contents in the tablets of more than 0.2% by weight, based on the entire tablet. Particularly preferred laundry detergents and cleaning product tablets comprise APGs in amounts of from 0.2 to 10% by weight, preferably from 0.2 to 5% by weight, and in particular from 0.5 to 3% by weight.

In order to develop the wash performance, the laundry detergent and cleaning product tablets of the invention comprise further surface-active substances from the group of anionic, nonionic, zwitterionic or cationic surfactants, distinct preference being given to anionic surfactants on economic grounds and on account of their performance spectrum.

Anionic surfactants used are, for example, those of the sulfonate and sulfate type. Suitable surfactants of the sulfonate type are preferably C_{9-13} alkylbenzenesulfonates, olefinsulfonates, i.e., mixtures of alkene- and hydroxyalkanesulfonates, and also disulfonates, as obtained, for example, from C_{12-18} monoolefins having a terminal or internal double bond by sulfonation with gaseous sulfur trioxide and subsequent alkaline or acidic hydrolysis of the sulfonation products. Also suitable are alkanesulfonates obtained from C_{12-18} alkanes, for example, by sulfochlorination or sulfoxidation with subsequent hydrolysis or neutralization, respectively. Likewise suitable are the esters of α-sulfo fatty acids (ester sulfonates), e.g., the α-sulfonated methyl esters of hydrogenated coconut, palm kernel or tallow fatty acids.

Further suitable anionic surfactants are sulfated fatty acid glycerol esters. By fatty acid glycerol esters are meant the monoesters, diesters and triesters, and also mixtures thereof, as obtained in the preparation by esterification of a monoglycerol with from 1 to 3 mol of fatty acid or in the transesterification of triglycerides with from 0.3 to 2 mol of glycerol. Preferred sulfated fatty acid glycerol esters here are the sulfation products of saturated fatty acids having 6 to 22 carbon atoms, examples being those of caproic acid, caprylic acid, capric acid, myristic acid, lauric acid, palmitic acid, stearic acid or behenic acid.

Preferred alk(en)yl sulfates are the alkali metal salts and, in particular, the sodium salts of the sulfuric monoesters of C_{12}-C_{18} fatty alcohols: for example, those of coconut fatty alcohol, tallow fatty alcohol, lauryl, myristyl, cetyl or stearyl alcohol, or of the C_{10}-C_{20} oxo alcohols, and of those monoesters of secondary alcohols of these chain lengths. Preference extends to alk(en)yl sulfates of said chain length which contain a synthetic straight-chain alkyl radical prepared on a petrochemical basis and which possess degradation behavior similar to that of the corresponding compounds based on fatty-chemical raw materials. From a detergents standpoint, the C_{12}-C_{16} alkyl sulfates and C_{12}-C_{15} alkyl sulfates, and also C_{14}-C_{15} alkyl sulfates, are preferred. Suitable anionic surfactants also include 2,3-alkyl sulfates, which are prepared, for example, in accordance with US Patents 3,234,258 or 5,075,041 and may be obtained as commercial products of the Shell Oil Company under the name DAN®.

The sulfuric monoesters of the straight-chain or branched C_{7-21} alcohols ethoxylated with from 1 to 6 mol of ethylene oxide, such as 2-methyl-branched C_{9-11} alcohols containing on average 3.5 mol of ethylene oxide (EO), or C_{12-18} fatty alcohols containing from 1 to 4 EO, are also suitable. Because of their high foaming, they are used in cleaning products only in relatively small amounts: for example, in amounts of from 1 to 5% by weight.

Further suitable anionic surfactants include the salts of alkylsulfosuccinic acid, which are also known as sulfosuccinates or as sulfosuccinic esters and which constitute monoesters and/or diesters of sulfosuccinic acid with alcohols, preferably fatty alcohols and especially ethoxylated fatty alcohols. Preferred sulfosuccinates contain C_{8-18} fatty alcohol radicals or mixtures thereof. Particularly preferred sulfosuccinates include a fatty alcohol radical which is derived from ethoxylated fatty alcohols which per se are nonionic surfactants (for description, see below). Particular preference is given in turn to sulfosuccinates whose fatty alcohol radicals are derived from ethoxylated fatty alcohols having a narrowed homolog distribution. Likewise, it is also possible to use alk(en)ylsuccinic acid having preferably 8 to 18 carbon atoms in the alk(en)yl chain, or salts thereof.

Further anionic surfactants include, in particular, soaps. Saturated fatty acid soaps are suitable, such as the salts of lauric acid, myristic acid, palmitic acid, stearic acid, hydrogenated erucic acid and behenic acid, as in particular are mixtures of soaps derived from natural fatty acids, e.g., coconut, palm kernel or tallow fatty acids.

The anionic surfactants, including the soaps, may be present in the form of their sodium, potassium or ammonium salts and also as soluble salts of organic bases, such as mono-, di- or triethanolamine. Preferably, the anionic surfactants are in the form of their sodium or potassium salts, in particular in the form of the sodium salts.

In the context of the present invention, preference is given to laundry detergent and cleaning product tablets containing from 5 to 60% by weight, preferably from 10 to 50% by weight, and in particular from 20 to 40% by weight, of anionic surfactant(s), based in each case on the tablet weight.

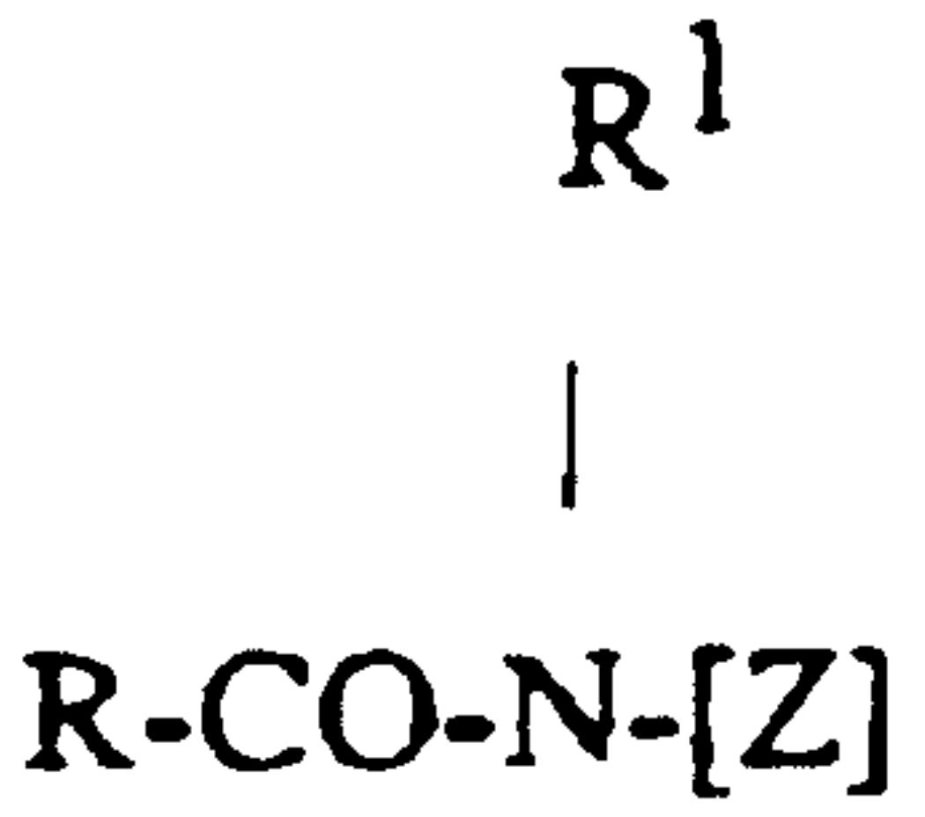
In connection with the selection of the anionic surfactants used in the laundry detergent and cleaning product tablets of the invention, the freedom of formulation is not restricted by any boundary conditions to be observed. Preferred laundry detergent and cleaning product tablets, however, have a soap content which exceeds 0.2% by weight, based on the overall weight of the tablet. Preferred anionic surfactants for use are the alkylbenzenesulfonates and fatty alcohol sulfates, with preferred laundry detergent and cleaning product tablets containing from 2 to 20% by weight, preferably from 5 to 15% by weight, and in particular from 7.5 to 12.5% by weight, of fatty alcohol sulfate(s), based in each case on the tablet weight.

Nonionic surfactants used are preferably alkoxylated, advantageously ethoxylated, especially primary, alcohols having preferably 8 to 18 carbon atoms and on average from 1 to 12 mol of ethylene oxide (EO) per mole of alcohol, in which the alcohol radical may be linear or, preferably, methyl-branched in position 2 or may comprise a mixture of linear and methyl-branched radicals, as are normally present in oxo-alcohol radicals. Particular preference is given, however, to alcohol ethoxylates having linear radicals from alcohols of natural origin having 12 to 18 carbon atoms, e.g. from coconut, palm, tallow fatty or oleyl alcohol, and containing on average from 2 to 8 EO per mole of alcohol. Examples of the preferred ethoxylated alcohols include C_{12-14} alcohols containing 3 EO or 4 EO, C_{9-11} alcohol containing 7 EO, C_{13-15} alcohols containing 3 EO, 5 EO, 7 EO or 8 EO, C_{12-18} alcohols containing 3 EO, 5 EO or 7 EO, and mixtures thereof, such as mixtures of C_{12-14} alcohol containing 3 EO and C_{12-18} alcohol containing 5 EO. The stated degrees of ethoxylation represent statistical mean values, which for a specific product may be an integer or a fraction. Preferred alcohol ethoxylates have a narrowed homolog distribution (narrow range ethoxylates, NREs). In addition to these nonionic surfactants, it is also possible to use fatty alcohols containing more than 12 EO. Examples thereof are tallow fatty alcohols containing 14 EO, 25 EO, 30 EO or 40 EO.

A further class of nonionic surfactants used with preference, which are used either as sole nonionic surfactant or in combination with other nonionic surfactants, are alkoxylated, preferably ethoxylated, or ethoxylated and propoxylated, fatty acid alkyl esters, preferably having 1 to 4 carbon atoms in the alkyl chain, especially fatty acid methyl esters, as described, for example, in Japanese Patent Application JP 58/217598 or which are prepared, preferably, in accordance with the process described in International Patent Application WO-A-90/13533.

Furthermore, nonionic surfactants of the amine oxide type - for example, N-cocoalkyl-N,N-dimethylamine oxide and N-tallowalkyl-N,N-dihydroxyethylamine oxide - and of the fatty acid alkanolamide type may be suitable. The amount of these nonionic surfactants is preferably not more than that of the ethoxylated fatty alcohols, in particular not more than half thereof.

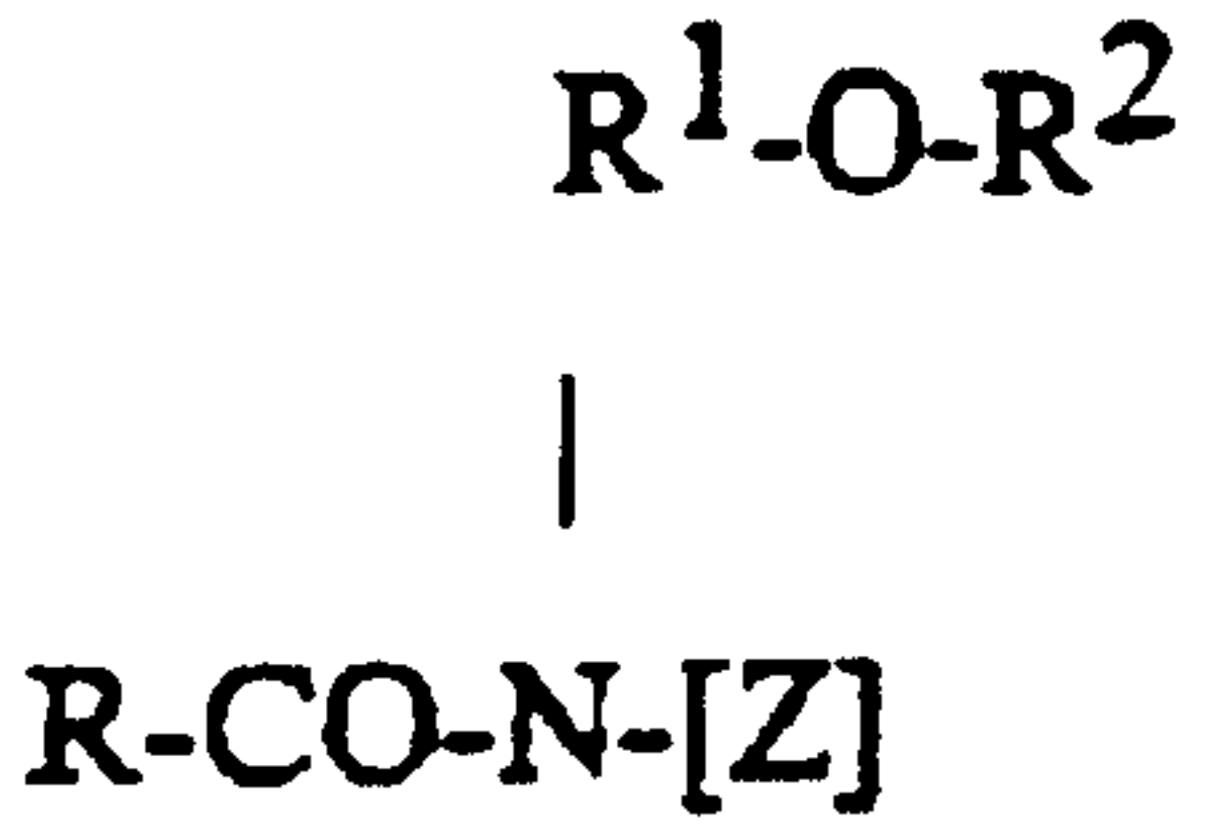
Further suitable surfactants are polyhydroxy fatty acid amides of the formula (I)



$$\begin{array}{l}\qquad R^1 \\ \qquad | \\ R\text{-}CO\text{-}N\text{-}[Z]\end{array} \qquad (I)$$

where RCO is an aliphatic acyl radical having 6 to 22 carbon atoms, R^1 is hydrogen or an alkyl or hydroxyalkyl radical having 1 to 4 carbon atoms, and [Z] is a linear or branched polyhydroxyalkyl radical having 3 to 10 carbon atoms and from 3 to 10 hydroxyl groups. The polyhydroxy fatty acid amides are known substances which may normally be obtained by reductive amination of a reducing sugar with ammonia, an alkylamine or an alkanolamine and subsequent acylation with a fatty acid, a fatty acid alkyl ester or a fatty acid chloride.

The group of the polyhydroxy fatty acid amides also includes compounds of the formula (II)



$$\begin{array}{l}\qquad R^1\text{-}O\text{-}R^2 \\ \qquad | \\ R\text{-}CO\text{-}N\text{-}[Z]\end{array} \qquad (II)$$

where R is a linear or branched or alkyl or alkenyl radical, having 7 to 12 carbon atoms, R^1 is a linear, branched or cyclic alkyl radical or an aryl radical, having 2 to 8 carbon atoms, and R^2 is a linear, branched or cyclic alkyl radical or an aryl radical or an oxy-alkyl radical, having 1 to 8 carbon atoms, preference being given to C_{1-4} alkyl radicals, or phenyl radicals, and [Z] is a linear polyhydroxyalkyl radical whose alkyl chain is substituted by at least two hydroxyl groups, or represents alkoxylated, preferably ethoxylated or propoxylated, derivatives of said radical.

[Z] is obtained preferably by reductive amination of a reduced sugar - for example, glucose, fructose, maltose, lactose, galactose, mannose or xylose. The N-alkoxy-substituted or N-aryloxy-substituted compounds can then be converted into the desired polyhydroxy fatty acid amides in accordance, for example, with the teaching of International Application WO-A-95/07331 by reaction with fatty acid methyl esters in the presence of an alkoxide as catalyst.

In addition to the detergent-active substances, builders are the most important ingredients of laundry detergents and cleaning products. In the laundry detergent and cleaning product tablets of the invention, all builders commonly used in laundry detergents and cleaning products may be present, i.e., in particular, zeolites, silicates, carbonates, organic cobuilders, and - where there are no ecological prejudices against their use - the phosphates as well.

Suitable crystalline, layer-form sodium silicates possess the general formula $NaMSi_xO_{2x+1}\cdot H_2O$, where M is sodium or hydrogen, x is a number from 1.9 to 4 and y is a number from 0 to 20, and preferred values for x are 2, 3 or 4. Crystalline phyllosilicates of this kind are described, for example, in European Patent Application **EP-A-0 164 514**. Preferred crystalline phyllosilicates of the stated formula are those in which M is sodium and x adopts the values 2 or 3. In particular, both β- and δ-sodium disilicates $Na_2Si_2O_5\cdot yH_2O$ are preferred, β-sodium disilicate being obtainable, for example, by the process described in International Patent Application **WO-A-91/08171**.

It is also possible to use amorphous sodium silicates having an $Na_2O:SiO_2$ modulus of from 1:2 to 1:3.3, preferably from 1:2 to 1:2.8, and in particular from 1:2 to 1:2.6, which are dissolution-retarded and have secondary washing properties. The retarded dissolution relative to conventional amorphous sodium silicates may have been brought about by a variety of means: for example, by surface treatment, compounding, compacting, or overdrying. In the context of this invention, the term "amorphous" also embraces "X-ray-amorphous". This means that in X-ray diffraction experiments the silicates do not produce the sharp X-ray reflections typical of crystalline substances but instead at best exhibit one or more maxima of the scattered X-rays, having a width of 2 or more degree units of the diffraction angle. However, particularly good builder properties may very well result if the silicate particles in electron diffraction experiments yield vague or even sharp diffraction maxima. The interpretation of this is that the products contain microcrystalline regions with a size of from 10 to several hundred nm, values of up to max. 50 nm and in particular up to max. 20 nm being preferred. So-called X-ray-amorphous silicates of this kind, which likewise possess retarded dissolution relative to the conventional waterglasses, are described, for example, in German Patent Application **DE-A-44 00 024**. Particular preference is given to compacted amorphous silicates, compounded amorphous silicates, and overdried X-ray-amorphous silicates.

The finely crystalline synthetic zeolite used, containing bound water, is preferably zeolite A and/or P. As zeolite P, zeolite MAP® (commercial product of Crosfield) is particularly preferred. Also suitable, however, are zeolite X, and also mixtures of A, X and/or P. Also commercially available, and suitable for preferred use in the context of the present invention, is, for example, a cocrystallizate of zeolite X and zeolite A (approximately 80% by weight zeolite X), which is sold by CONDEA Augusta S.p.A. under the brand name VEGOBOND AX® and may be described by the formula

$nNa_2O \cdot (1-n)K_2O \cdot Al_2O_3 \cdot (2-2.5)SiO_2 \cdot (3.5-5.5)H_2O$.

The zeolite can both be used as a builder in a granular compound formulation and used as a kind of "powdering" for the entire mixture intended for compression, it being usual to utilize both ways of incorporating the zeolite into the premix. Suitable zeolites have an average particle size of less than 10 µm (volume distribution; measurement method: Coulter counter) and contain preferably from 18 to 22% by weight, in particular from 20 to 22% by weight, of bound water.

Of course, the phosphates, which are general knowledge, may also be used as builder substances, provided such use is not to be avoided on ecological grounds. The sodium salts of the orthophosphates, of the pyrophosphates and, in particular, of the tripolyphosphates are especially suitable.

Organic builder substances which may be used are, for example, the polycarboxylic acids that can be used in the form of their sodium salts, such as citric acid, adipic acid, succinic acid, glutaric acid, tartaric acid, sugar acids, amino carboxylic acids, nitrilotriacetic acid (NTA), provided the use of such is not objectionable on ecological grounds, and also mixtures thereof. Preferred salts are the salts of the polycarboxylic acids such as citric acid, adipic acid, succinic acid, glutamic acid, tartaric acid, sugar acids, and mixtures thereof.

In order to facilitate the disintegration of highly compacted tablets it is possible to incorporate disintegration aids, known as tablet disintegrants, into them in order to shorten the disintegration times. Tablet disintegrants or disintegration accelerators are, according to Römpp (9th Edition, Vol. 6, p. 4440) and Voigt "*Lehrbuch der pharmazeutischen Technologie*"

(6th Edition, 1987, pp. 182-184), auxiliaries which ensure the rapid disintegration of tablets in water or gastric fluid and ensure the release of the drugs in absorbable form.

These disintegrants increase their volume on ingress of water, on the one hand with an increase in the inherent volume (swelling), while on the other hand a pressure may also be produced by way of the release of gases, said pressure causing the tablet to disintegrate into smaller particles. Examples of established disintegration aids are carbonate/citric acid systems, in which context other organic acids may also be used. Swelling disintegration aids are, for example, synthetic polymers such as polyvinylpyrrolidone (PVP) or natural polymers and/or modified natural substances such as cellulose and starch and their derivatives, alginates, or casein derivatives.

Preferred laundry detergent and cleaning product tablets contain from 0.5 to 10% by weight, preferably from 3 to 7% by weight, and in particular from 4 to 6% by weight, of one or more disintegration aids, based in each case on the tablet weight.

Preferred disintegrants used in the context of the present invention are cellulose-based disintegrants, and so preferred laundry detergent and cleaning product tablets contain a cellulose-based disintegrant of this kind in amounts of from 0.5 to 10% by weight, preferably from 3 to 7% by weight, and in particular from 4 to 6% by weight. Pure cellulose has the formal empirical composition $(C_6H_{10}O_5)_n$ and, viewed formally, is a β-1,4-polyacetal of cellobiose, which in turn is composed of two molecules of glucose. Suitable celluloses consist of from about 500 to 5000 glucose units and, accordingly, have average molecular masses of from 50,000 to 500,000. Also suitable for use in the context of the present invention as cellulose-based disintegrants are cellulose derivatives obtainable by polymer-analogous reactions from cellulose. Chemically modified celluloses of this kind include, for example, products from esterifications and etherifications in which hydroxy hydrogen atoms have been substituted. However, celluloses in which the hydroxy groups have been replaced by functional groups which are not attached via an oxygen atom may also be used as cellulose derivatives. The group of the cellulose derivatives embraces, for example, alkali metal celluloses, carboxymethylcellulose (CMC), cellulose esters and cellulose ethers, and aminocelluloses. Said cellulose derivatives are preferably not used as sole cellulose-based disintegrants but instead are used in a mixture with cellulose. The cellulose derivative content of these mixtures is preferably below 50% by weight, with particular preference below 20% by weight, based on the cellulose-based disintegrant. With particular preference, the cellulose-based disintegrant used is pure cellulose free from cellulose derivatives.

The cellulose used as a disintegration aid is preferably used not in finely divided form but instead, before being admixed to the premixes intended for compression, is converted into a relatively coarse form - for example, is granulated or compacted. Laundry detergent and cleaning product tablets comprising disintegrants in granular form or, if appropriate, cogranulated form are described in German Patent Applications **DE 197 09 991** (Stefan Herzog) and **DE 197 10 254** (Henkel) and in International Patent Application **PCT/EP 98/1203** (Henkel). Those documents also contain further details on the preparation of granulated, compacted or cogranulated cellulose disintegrants. The particle sizes of such disintegrants are usually above 200 µm, preferably between 300 and 1600 µm to the extent of at least 90% by weight, and in particular between 400 and 1200 µm to the extent of at least 90% by weight. The relatively coarse cellulose-based disintegration aids mentioned above and described in more detail in the cited documents are preferred for use as disintegration aids in the context of the present invention and are obtainable commercially, for example, under the designation Arbocel® TF-30-HG from Rettenmaier.

As a further cellulose-based disintegrant, or as a constituent of this component, it is possible to use microcrystalline cellulose. This microcrystalline cellulose is obtained by partial hydrolysis of celluloses under conditions such that only the amorphous regions (approximately 30% of the total cellulose mass) of the celluloses are attacked and broken down completely, leaving the crystalline regions (approximately 70%) intact. Subsequent deaggregation of the microfine celluloses resulting from the hydrolysis yields the microcrystalline celluloses, which have primary particle sizes of approximately 5 µm and can be compacted, for example, to granules having an average particle size of 200 µm.

Laundry detergent and cleaning product tablets further comprising a disintegration aid, preferably a cellulose-based disintegration aid, preferably in granular, cogranulated or compacted form, in amounts of from 0.5 to 10% by weight, preferably from 3 to 7% by weight, and in particular from 4 to 6% by weight, based in each case on the tablet weight, are particularly preferred in the context of the present invention.

Wash-active and detersive tablets are produced by applying pressure to a mixture intended for compression that is located in the cavity of a press. In the simplest case of tablet production, which is called simply tableting below, the mixture to be tableted is compressed directly, i.e., without granulation beforehand. The advantages of this so-called direct tableting are its simple and cost-effective application, since no other process steps and, accordingly, no additional equipment either are required. However, these advantages are also accompanied by disadvantages. For instance, a powder mixture which is to be tableted directly is required to possess sufficient plastic deformability and to have good flow properties; furthermore, it must not exhibit any separation tendencies whatsoever during storage, transport, and the filling of the die. With many mixtures of substances, these three prerequisites can only be managed with extreme difficulty, so that direct tableting, especially for the production of laundry detergent and cleaning product tablets, is seldom employed. The usual route for producing laundry detergent and cleaning product tablets starts, therefore, from pulverulent components ("primary particles"), which by means of suitable techniques are agglomerated or granulated to form secondary particles having a greater particle diameter. These granules, or mixtures of different granules, are then mixed with individual pulverulent adjuvants and passed on for tableting.

In the context of the present invention, preferred laundry detergent and cleaning product tablets are obtained by compressing a particulate premix comprising at least one set of surfactant-containing granules and at least one subsequently admixed pulverulent component. For the subsequent laundry detergent and cleaning product tablets, it is advantageous if the premix for compression has a bulk density close to that of conventional compact laundry detergents. In particular, it is preferable for the premix for compression to have a bulk density of at least 500 g/l, preferably at least 600 g/l, and in particular more than 700 g/l.

Before the compression of the particulate premix to form laundry detergent and cleaning product tablets, the premix may be "powdered" with finely divided surface treatment agents. This may be of advantage for the constitution and physical properties both of the premix (storage, compression) and of the finished laundry detergent and cleaning product tablets. Finely divided powdering agents have long been known in the prior art, with zeolites, silicates or other inorganic salts usually being used. Preferably, however, the premix is "powdered" with finely divided zeolite, preference being given to zeolites of the faujasite type. In the context of the present invention, the term "zeolite of the faujasite type" characterizes all three zeolites which form the faujasite subgroup of the zeolite structure group 4 (compare Donald W. Breck: "Zeolite Molecular Sieves", John Wiley & Sons, New York, London, Sydney, Toronto, 1974, page 92). In addition to zeolite X, therefore, it is also possible to use zeolite Y and faujasite and also mixtures of these compounds, preference being given to pure zeolite X.

Mixtures or cocrystallizates of zeolites of the faujasite type with other zeolites, which need not necessarily belong to the zeolite structure group 4, may also be used as powdering agents, it being advantageous for at least 50% by weight of the powdering agent to consist of a faujasite-type zeolite.

In the context of the present invention, preference is given to laundry detergent and cleaning product tablets consisting of a particulate premix which comprises granular components and pulverulent substances admixed subsequently, where the subsequently admixed, or one of the subsequently admixed, pulverulent components is a zeolite of the faujasite type having particle sizes less than 100 µm, preferably less than 10 µm, and in particular less than 5 µm, and accounts for at least 0.2% by weight, preferably at least 0.5% by weight, and in particular more than 1% by weight, of the premix for compression.

In addition to the abovementioned constituents, surfactant, builder, and disintegration aid, the laundry detergent and cleaning product tablets of the invention may comprise further ingredients which are customary in laundry detergent and cleaning products, from the group consisting of bleaches, bleach activators, enzymes, fragrances, perfume carriers, fluorescers, dyes, foam inhibitors, silicone oils, antiredeposition agents, optical brighteners, graying inhibitors, color transfer inhibitors, and corrosion inhibitors.

Among the compounds used as bleaches which in water produce H_2O_2, particular significance is possessed by sodium perborate tetrahydrate and sodium perborate monohydrate. Examples of other bleaches which can be used are sodium percarbonate, peroxypyrophosphates, citrate perhydrates, and H_2O_2-donating peracidic salts or peracids, such as perbenzoates, peroxophthalates, diperazelaic acid, phthaloiminoperacid or diperdodecanedioic acid.

In order to achieve an improved bleaching action when washing at temperatures of 60°C and below, it is possible to incorporate bleach activators as the sole constituent or as an ingredient of component (b). Bleach activators used may be compounds which under perhydrolysis conditions give rise to aliphatic peroxocarboxylic acids having preferably 1 to 10 carbon atoms, especially 2 to 4 carbon atoms, and/or substituted or unsubstituted perbenzoic acids. Suitable substances are those which carry O-acyl and/or N-acyl groups of the stated number of carbon atoms, and/or substituted or unsubstituted benzoyl groups. Preference is given to polyacylated alkylenediamines, especially tetraacetylethylenediamine (TAED), acylated triazine derivatives, especially 1,5-diacetyl-2,4-dioxohexahydro-1,3,5-triazine (DADHT), acylated glycolurils, especially tetraacetylglycoluril (TAGU), N-acyl imides, especially N-nonanoylsuccinimide (NOSI), acylated phenolsulfonates, especially n-nonanoyl- or isononanoyloxybenzenesulfonate (n- or iso-NOBS), carboxylic anhydrides, especially phthalic anhydride, acylated polyhydric alcohols, especially triacetin, ethylene glycol diacetate, and 2,5-diacetoxy-2,5-dihydrofuran.

In addition to the conventional bleach activators or in their place it is also possible to incorporate what are known as bleaching catalysts into the tablets. These substances comprise bleach-boosting transition metal salts or transition metal complexes such as, for example, Mn-, Fe-, Co-, Ru- or Mo-salen complexes or -carbonyl complexes. In addition, Mn, Fe, Co, Ru, Mo, Ti, V and Cu complexes with N-containing tripod ligands, and also Co-, Fe-, Cu- and Ru-ammine complexes, may be used as bleaching catalysts.

Suitable enzymes are those from the class of the proteases, lipases, amylases, cellulases, and/or mixtures thereof. Especially suitable enzymatic active substances are those obtained from bacterial strains or fungi, such as Bacillus subtilis, Bacillus licheniformis and Streptomyces griseus. Preference is given to the use of proteases of the subtilisin type, and especially to proteases obtained from Bacillus lentus. Of particular interest in this context are mixtures of enzymes; for example, of protease and amylase or protease and lipase or protease and cellulase, or of cellulase and lipase, or of protease, amylase and lipase or protease, lipase and cellulase, but especially mixtures containing cellulase. Peroxidases or oxidases have also proven suitable in some cases. The enzymes may be adsorbed on carrier substances and/or embedded in coat substances in order to protect them against premature decomposition. The proportion of the enzymes, enzyme mixtures or enzyme granules in the tablets of the invention may amount, for example, to from about 0.1 to 5% by weight, preferably from 0.1 to about 2% by weight.

In addition, the laundry detergent and cleaning product tablets may also include components which have a positive effect on the capacity for oil and fat to be washed off from textiles (these components being known as soil repellents). This effect is particularly marked if a textile which has already been washed several times beforehand with a laundry detergent of the invention comprising this oil- and fat-dissolving component becomes soiled. The preferred oil- and fat-dissolving components include, for example, nonionic cellulose ethers such as methylcellulose and methylhydroxypropyl cellulose having a methoxyl group fraction of from 15 to 30% by weight and a hydroxypropoxyl group fraction of from 1 to 15% by weight, based in each case on the nonionic cellulose ether, and also the prior art polymers of phthalic acid and/or of terephthalic acid and/or of derivatives thereof, especially polymers of ethylene terephthalate and/or polyethylene glycol terephthalates, or anionically and/or nonionically modified derivatives of these. Of these, particular preference is given to the sulfonated derivatives of phthalic acid polymers and of terephthalic acid polymers.

As optical brighteners, the tablets may comprise derivatives of diaminostilbenedisulfonic acid and/or its alkali metal salts. Suitable brighteners are, for example, salts of 4,4'-bis(2-anilino-4-morpholino-1,3,5-triazinyl-6-amino)stilbene-2,2'-disulfonic acid or compounds of similar construction which instead of the morpholino group carry a diethanolamino group, a methylamino group, an anilino group, or a 2-methoxyethylamino group. In addition, brighteners of the substituted diphenylstyryl type may be present, examples being the alkali metal salts of 4,4'-bis(2-sulfostyryl)biphenyl, of 4,4'-bis(4-chloro-3-sulfostyryl)-biphenyl, or of 4-(4-chlorostyryl)-4'-(2-sulfostyryl)-biphenyl. Mixtures of the abovementioned brighteners may also be used.

Dyes and fragrances are added to the compositions of the invention in order to enhance the esthetic appeal of the products and to provide the user not only with the wash performance but also with a product which, visually and sensorially, is "typical and unmistakable". As perfume oils and fragrances it is possible to use individual odorant compounds, e.g., the synthetic products of the type of the esters, ethers, aldehydes, ketones, alcohols, and hydrocarbons. Odorant compounds of the ester type are, for example, benzyl acetate, phenoxyethyl isobutyrate, p-tert-butylcyclohexyl acetate, linalyl acetate, dimethylbenzylcarbinyl acetate, phenylethyl acetate, linalyl benzoate, benzyl formate, ethyl methylphenylglycinate, allyl cyclohexylpropionate, styrallyl propionate, and benzyl salicylate. The ethers include, for example, benzyl ethyl ether; the aldehydes include, for example, the linear alkanals having 8 to 18 carbon atoms, citral, citronellal, citronellyloxyacetaldehyde, cyclamen aldehyde, hydroxycitronellal, lilial and bourgeonal; the ketones include, for example, the ionones, α-isomethylionone and methyl cedryl ketone; the alcohols include anethole, citronellol, eugenol, geraniol, linalool, phenylethyl alcohol and terpineol; and the hydrocarbons include primarily the terpenes such as limonene and pinene. Preference is given, however, to the use of mixtures of different odorants which together produce an appealing fragrance note. Such perfume oils may also comprise natural mixtures of odorants, as are obtainable from plant sources, e.g., pine oil, citrus oil, jasmine oil, patchouli oil, rose oil, or ylang-ylang oil. Likewise suitable are clary sage oil, camomile oil, clove oil, balm oil, mint oil, cinnamon leaf oil, lime blossom oil, juniperberry oil, vetiver oil, olive oil, galbanum oil and labdanum oil, and also orange blossom oil, neroliol, orange peel oil, and sandalwood oil.

The dye content of the tablets of the invention is usually less than 0.01% by weight, while fragrances may account for up to 2% by weight of the overall formulation.

The fragrances may be incorporated directly into the compositions of the invention; alternatively, it may be advantageous to apply the fragrances to carriers which reinforce the adhesion of the perfume on the laundry and ensure persistent fragrance of the textiles by means of a slower release of fragrance. Examples of such carrier materials which have proven suitable are cyclodextrins, in which case, in addition, the cyclodextrin-perfume complexes may also be coated with further auxiliaries.

In order to enhance the aesthetic appeal of the compositions of the invention, they may be colored with suitable dyes. Preferred dyes, whose selection causes no difficulty whatsoever to the skilled worker, possess a high level of storage stability and insensitivity to the other ingredients of the compositions, and to light, and do not possess any pronounced substantivity with respect to textile fibers, so that they do not stain said fibers.

The tablets of the invention are produced first of all by the dry mixing of the constituents, some or all of which may have been pregranulated, and the subsequent shaping - in particular, compressing to form tablets - which can be done by recourse to conventional processes. To produce the tablets of the invention, the premix is compacted in a so-called die between two punches to form a solid compact. This process, referred to below for short as tableting, is divided into four sections: metering, compaction (elastic deformation), plastic deformation, and ejection.

First of all, the premix is introduced into the die, the amount and thus the weight and form of the resulting tablet being determined by the position of the lower punch and the shape of the compression tool. Consistent metering even at high tablet throughputs is achieved preferably by volumetric metering of the premix. In the subsequent course of tableting, the upper punch contacts the premix and is lowered further in the direction of the lower punch. Under this compaction, the particles of the premix are pressed closer to one another, with a continual reduction in the cavity volume within the filling between the punches. From a certain position of the upper punch (and thus from a certain pressure on the premix), plastic deformation begins, in which the particles coalesce and the tablet is formed. Depending on the physical properties of the premix, some of the premix particles are also crushed, and at even higher pressures, sintering of the premix occurs. As the compression speed increases, i.e. with high throughputs, the phase of elastic deformation becomes shorter and shorter, so that the resulting tablets may have larger or smaller cavities. In the final step of tableting, the finished tablet is ejected from the die by the lower punch and is conveyed away by subsequent transport devices. At this point in time, only the weight of the tablet is ultimately fixed, since owing to physical processes (re-expansion, crystallographic effects, cooling, etc.) the compacts may still change their shape and size.

Tableting takes place in commercially customary tableting presses, which may in principle be equipped with single or double punches. In the latter case the upper punch is not used alone to build up pressure; the lower punch, as well, moves toward the upper punch during the compression operation, while the upper punch presses downward. For small production volumes it is preferred to use eccentric tableting presses, where the punch or punches is or are fastened to an eccentric disk which is itself mounted on an axle with a particular speed of revolution. The movement of these compressing punches is comparable with the way in which a customary four-stroke engine operates. Compression may take place with one upper punch and one lower punch, or else a plurality of punches may be fastened to one eccentric disk, in which case the number of die bores is increased accordingly. The throughputs of eccentric presses vary, depending on model, from several hundred to a maximum of 3000 tablets per hour.

For larger throughputs, rotary tableting presses are chosen, in which a larger number of dies is arranged in a circle on a so-called die table. Depending on model, the number of dies varies between 6 and 55, with larger dies also being obtainable commercially. Each die on the die table is allocated an upper and lower punch, it being possible in turn for the compressive pressure to be built up actively only by the upper punch or lower punch or else by both punches. The die table and the punches move around a common, vertical axis, the punches being brought into the filling, compaction, plastic deformation, and ejection positions, during revolution, with the aid of raillike cam tracks. At the positions necessitating a considerable lifting or lowering of the punches (filling, compaction, ejection), these cam tracks are assisted by additional low-pressure pieces, low tension rails, and discharge tracks. The die is filled by way of a rigid feed device, known as the filling shoe, which is connected to a reservoir vessel for the premix. The compressive pressure on the premix can be adjusted individually for upper punch and lower punch by way of the compression paths, the buildup of pressure taking place by the rolling of the punch shaft heads past adjustable pressure rolls.

In order to increase the throughput, rotary presses may also be provided with two filling shoes, in which case only a half-circle need be traveled in order to produce one tablet. For the production of two-layer and multilayer tablets, a plurality of filling shoes are arranged in series, with the slightly compressed first layer not being ejected before the subsequent filling. By means of an appropriate process regime, it is also possible in this way to produce laminated tablets and inlay tablets having a structure like that of an onion skin, where in the case of the inlay tablets the top face of the core, or of the core layers, is not covered and therefore remains visible. Rotary tableting presses may also be equipped with single or multiple tools, so that, for example, an outer circle with 50 bores and an inner circle with 35 bores are used simultaneously for compression. The throughputs of modern rotary tableting presses amount to more than one million tablets per hour.

Tableting machines suitable in the context of the present invention are obtainable, for example, from the following companies: Apparatebau Holzwarth GbR, Asperg, Wilhelm Fette GmbH, Schwarzenbek, Hofer GmbH, Weil, KILIAN, Cologne, KOMAGE, Kell am See, KORSCH Pressen GmbH, Berlin, Mapag Maschinenbau AG, Berne (CH) and Courtoy N.V., Halle (BE/LU). Particularly suitable, for example, is the hydraulic double-pressure press HPF 630 from LAEIS, D.

The tablets may be manufactured in predetermined three-dimensional forms and predetermined sizes. Suitable three-dimensional forms include virtually all practicable designs; i.e., for example, bar forms, rod or ingot forms, cubes, blocks, and corresponding three-dimensional elements having planar side faces, and also, in particular, cylindrical designs with a circular or oval cross section. This last embodiment embraces the presentation form ranging from the tablet through to compact cylinders having a height-to-diameter ratio of more than 1.

The portioned compacts may in each case be designed as individual elements, separated from one another, corresponding to the predetermined dosing amount of the laundry detergents and/or cleaning products. Likewise, however, it is possible to design compacts which combine a plurality of such mass units in one compact, with, in particular, predefined intended breakage points providing for easy separation of smaller, portioned units. For the use of textile detergents in machines of the type customary in Europe, with a horizontally disposed mechanism, it may be judicious to design the portioned compacts as tablets, in cylinder or block form, preference being given to a diameter/height ratio in the range from about 0.5:2 to 2:0.5. Commercially customary hydraulic presses, eccentric presses or rotary presses are suitable apparatus in particular for producing compacts of this kind.

The three-dimensional form of another embodiment of the tablets is adapted in its dimensions to the dispenser drawer of commercially customary domestic washing machines, so that the tablets can be metered directly, without a metering aid, into the dispenser drawer, where they dissolve during the rinsing-in operation. It is, however, also possible of course to use the laundry detergent tablets with a metering aid, and this is preferred in the context of the present invention.

Another preferred tablet which may be produced has a sheetlike or barlike structure with, in alternation, long, thick and short, thin segments, so that individual segments can be broken off from this "slab" at the intended breakage points, represented by the short, thin segments, and introduced into the machine. This principle of the laundry detergent "bar" may also be realized in other geometric forms, an example being vertical triangles connected to one another along only one of their sides.

Yet another possibility, however, is not to compress the various components into a uniform tablet but instead to produce tablets having a plurality of layers, i.e., at least two layers. In this case it is also possible for these different layers to have different dissolution rates. This may result in advantageous performance properties of the tablets. If, for example, the tablets include components which have adverse effects on one another, then it is possible to integrate one component into the faster-dissolving layer and the other component into a slower-dissolving layer, so that the first component has already reacted when the second goes into solution. The layer structure of the tablets may be in the form of a stack, with the inside layer(s) at the edges of the tablet dissolving even when the outside layers have not yet dissolved completely; alternatively, the inside layer(s) may be enveloped completely by the respective layer(s) lying further out, which prevents the premature dissolution of constituents of the inside layer(s).

In a further-preferred embodiment of the invention, a tablet consists of at least three layers, i.e., two outside layers and at least one inside layer, and a peroxy bleach is present at least in one of the inside layers, while in the stacklike tablet the two outer layers and in the shell-like tablets the outermost layers are free from peroxy bleach. It is also possible, furthermore, to separate peroxy bleach and any bleach activators and/or enzymes present from one another, spatially, in one tablet. Multilayer tablets of this kind have the advantage that they can be used not just by way of a dispenser drawer or by way of a dosing apparatus which is placed in the wash liquor; rather, it is also possible in such cases to place the tablet into the machine in direct contact with the textiles, without running the risk of spotting by bleaches and the like.

Similar effects can also be achieved by coating individual constituents of the laundry detergent and cleaning product composition intended for compression, or of the entire tablet. For this purpose, the tablets to be coated may be sprayed, for example, with aqueous solutions or emulsions, or may receive a coating by the technique of melt coating.

Following compression, the laundry detergent and cleaning product tablets possess high stability. The fracture strength of cylindrical tablets can be ascertained by way of the parameter of the diametral fracture stress. This can be determined in accordance with

$$\sigma = \frac{2P}{\pi D t}$$

In this formula, σ is the diametral fracture stress (DFS) in Pa, P is the force in N which leads to the pressure exerted on the tablet, which pressure causes the fracture of the tablet, D is the tablet diameter, in meters, and t is the tablet height.

Examples:

By blending surfactant-containing granules with pulverulent preparation components, premixes were prepared which were compressed to laundry detergent tablets in a Korsch tableting press. The compressive pressure was adjusted to give in each case two series of tablets differing in their hardness.

The surfactant granules which lead to the tablets E1 and E2 of the invention contain 1% by weight APG (= 0.6% by weight based on the entire premix), while comparison granules, which on compression give the tablets V1 and V2, contain no APG. The tablets E1 and E2 and, respectively, V1 and V2 differ only in their hardness, not in their composition. The composition of the surfactant granules, and the composition of the premixes intended for compression (and thus of the tablets), are shown in Tables 1 and 2.

Table 1: Composition of the surfactant granules [% by weight]

	Granules for E1/2	**Granules for V1/2**
C_{9-13} alkylbenzenesulfonate	19.4	18.6
C_{12-18} fatty alcohol containing 7 EO	4.8	5.7
C_{12-18} fatty alcohol sulfate	5.2	5.4
C_{12-16} alkyl 1,4-glycoside	1.0	-
Soap	1.6	1.6
Optical brightener	0.3	0.3
Sodium carbonate	17.0	16.6
Sodium silicate	5.6	5.4
Acrylic acid-maleic acid copolymer	5.6	5.4
Zeolite A (anhydrous active substance)	28.5	29.9
Na 1,1-hydroxyethanediphosphonate	0.8	0.8
Water, salts	remainder	remainder

Table 2: Composition of the premix [% by weight]:

Surfactant granules	61.3	61.3
Zeolite	2.0	2.0
Sodium perborate monohydrate	23.7	23.7
TAED	2.4	2.4
Foam inhibitor	4.7	4.7
Polyacrylate	1.4	1.4
Perfume	0.5	0.5
Disintegration aid (cellulose)*	4.0	4.0

* Compacted cellulose (particle size: 90% by weight > 400 µm)

The hardness of the tablets was measured by deformation of the tablet until it fractured, with the force acting on the side faces of the tablet and the maximum force withstood by the tablet being measured.

To determine the tablet disintegration, the tablet was placed in a glass beaker with water (600 ml of water, temperature 30°C), and the time taken for the tablet to undergo complete disintegration was measured.

The experimental data are shown in Table 3:

Table 3: Laundry detergent tablets [physical data]

Tablet	**E1**	**V1**	**E2**	**V2**
Tablet hardness	43 N	45 N	60 N	53 N
Tablet disintegration	10 sec	35 sec	35 sec	> 120 sec

patent claims:

1. A laundry detergent or cleaning product tablet of compacted particulate laundry detergent or cleaning product, comprising surfactant(s), builder(s), and, if desired, further laundry detergent or cleaning product constituents, wherein the tablet comprises from 0.2 to 10% by weight of surfactant(s) from the group of alkyl polyglycosides and less than 5% by weight of potassium carbonate.

2. The tablet as claimed in claim 1, which comprises from 0.2 to 5% by weight, of APGs, based on the tablet.

3. The tablet as claimed in claim 1 or 2, where from 0.5 to 3% by weight of APGs, based on the tablet weight is present.

4. The tablet as claimed in any of claims 1 to 3, wherein the APGs it comprises has a degree of glycosidation of from 1.0 to 4.0.

5. The tablet as claimed in claim 4, wherein the degree of glycosidation is from 1.0 to 2.0.

6. The tablet as claimed in claim 4, wherein the degree of glycosidation is from 1.1 to 1.4.

7. The tablet as claimed in any of claims 1 to 6, wherein an alkyl polyglucoside is used as the APG.

8. The tablet as claimed in claims 1 to 7, further comprising a cellulose-based disintegration aid.

9. The tablet as claimed in any of claims 1 to 8, obtained by compressing a particulate premix comprising at least one set of surfactant-containing granules and at least one subsequently admixed pulverulent component.

10. The tablet as claimed in claim 9, wherein the premix for compression has a bulk density of at least

11. The tablet as claimed in claim 10, wherein the bulk density is at least 600 g/l.

12. The tablet as claimed in claim 10, wherein the bulk density is more than 700 g/l.

13. The tablet as claimed in any of claims 1 to 12, wherein the subsequently admixed, pulverulent components is a zeolite of the faujasite type having particle sizes less than 100 μm, of the premix for compression.

14. The tablet as claimed in claim 13, wherein the particle sizes are less than 10 μm.

15. The tablet as claimed in claim 13, wherein the particle sizes are less than 5 μm.

16. The tablet as claimed in claim 13, 14 or 15, wherein the zeolite is present in at least 0.5% by weight.

17. The tablet as claimed in claim 13, 14 or 15, wherein the zeolite is present in more than 1% by weight.

18. The tablet as claimed in any of claims 1 to 17, further comprising one or more substances from the group consisting of builders, bleaches, bleach activators, enzymes, pH standardizers, fragrances, perfume carriers, fluorescers, dyes, foam inhibitors, silicone oils, antiredeposition agents, optical brighteners, graying inhibitors, color transfer inhibitors, and corrosion inhibitors.