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(54) **Titre : PRODUITS NETTOYANTS POUR LA PEAU ET LES MAINS A EMOLLIENTS HYDROPHILES**
 (54) **Title: SKIN AND HAND CLEANING COMPOSITIONS WITH HYDROPHILIC EMOLLIENTS**

(57) **Abrégé/Abstract:**

The invention relates to skin cleansers/hand cleaners, particularly coarse hand cleaners, containing at least 0.1 wt.% of at least one hydrophilic emollient having an HLB value of ≥ 10 . Said skin cleansers/ hand cleaners especially contain, relative to the entire composition of the cleanser/cleaner, a.) at least 0.1 wt.% of at least one hydrophilic emollient, preferably a polyol ester, b.) 2 to 40 wt.% of at least one surfactant selected from among the group comprising fatty alcohol ethoxylates, fatty alcohol ether sulfates, and salts of sulfated and/or sulfonated fatty acids, c.) 30 to 90 wt.% of water, d.) 0 to 30 wt.% of one or more cleaning promoters selected from among the group comprising polyols, polyether, polyphosphates, and phosphates, e.) 0 to 30 wt.% of one or more abrasive agents, f.) 0 to 1.0 wt.% of propoxylated fatty alcohols, g.) one or more optional viscosity-forming agents, h.) other optional cosmetic auxiliary agents, additives, and/or active substances, the total of components a.) to h.) amounting to 100 wt.%.

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(54) Title: SKIN CLEANSER/HAND CLEANERS COMPRISING HYDROPHILIC EMOLLIENTS

(54) Bezeichnung: HAUT- UND HÄNDEREINIGUNGSMITTEL MIT HYDROPHILEN EMOLLIENTS

(57) Abstract: The invention relates to skin cleansers/hand cleaners, particularly coarse hand cleaners, containing at least 0.1 wt.% of at least one hydrophilic emollient having an HLB value of ≥ 10 . Said skin cleansers/hand cleaners especially contain, relative to the entire composition of the cleanser/cleaner, a.) at least 0.1 wt.% of at least one hydrophilic emollient, preferably a polyol ester, b.) 2 to 40 wt.% of at least one surfactant selected from among the group comprising fatty alcohol ethoxylates, fatty alcohol ether sulfates, and salts of sulfated and/or sulfonated fatty acids, c.) 30 to 90 wt.% of water, d.) 0 to 30 wt.% of one or more cleaning promoters selected from among the group comprising polyols, polyether, polyphosphates, and phosphates, e.) 0 to 30 wt.% of one or more abrasive agents, f.) 0 to 1.0 wt.% of propoxylated fatty alcohols, g.) one or more optional viscosity-forming agents, h.) other optional cosmetic auxiliary agents, additives, and/or active substances, the total of components a.) to h.) amounting to 100 wt.%.(57) Zusammenfassung: Die Erfindung betrifft Haut- und Handreinigungsmittel, insbesondere Grobhandreiniger, die einen Gehalt von mindestens 0,1 Gew.-% von wenigstens einem hydrophilen Emollient mit einem HLB-Wert von ≥ 10 aufweisen, insbesondere mit einem Gehalt, jeweils bezogen auf die Gesamtzusammensetzung des Reinigungsmittels, von den Komponenten a.) mindestens 0,1 Gew.-% von wenigstens einem hydrophilen Emollient, bevorzugt ein Polyolester, b.) 2 bis 40 Gew.-% wenigstens ein Tensid ausgewählt aus der Gruppe der Fettalkoholethoxylate, Fettalkoholethersulfate und Salze sulfierter und/oder sulfonierter Fettsäuren, c.) 30 bis 90 Gew.-% Wasser, d.) 0 bis 30 Gew.-% eines oder mehrerer Reinigungsverstärker ausgewählt aus der Gruppe der Polyole, Polyether, Polyphosphate und Phosphate, e.) 0 bis 30 Gew.-% eines oder mehrerer Abrasiva, f.) 0 bis 1,0 Gew.-% propoxylierte Fettalkohole, g.) gegebenenfalls ein oder mehrere viskositätsbildende Mittel, h.) gegebenenfalls weitere kosmetische Hilfs-, Zusatz- und/oder Wirkstoffe, wobei die Summe der Komponenten a.) bis h.) 100 Gew. % ergibt.

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"Skin and hand cleaning compositions with hydrophilic emollients"

The invention relates to skin and hand cleaning
5 compositions with hydrophilic emollients with improved dermatological compatibility and to the use of the compositions for removing extreme soilings.

10 Skin and hand cleaning compositions are used extensively in industry as so-called rough hand cleaners, in particular wherever stubborn soilings occur, which are caused by paints, fats, oils, lubricants, metal dusts, graphite, soot and the like.

15 The more often such products are applied to the skin in the industrial sector (up to 6 times and more often per day), the more considerable the disadvantageous effects of the abrasives, surfactants or surfactant mixtures and in particular also solvents, such as, for example,
20 aliphatic hydrocarbons, terpenes, carboxylic acid esters of the type dimethyl adipate, dimethyl glutarate, dimethyl succinate (DBE) and di-n-butyl adipate or diisopropyl adipate, which have been described in DE 43 35933 A1, contained in these rough
25 hand cleaners come to the fore, namely the degreasing and drying-out of the skin through the destruction of the hydro-lipid mantle of the skin. This then leads to increased absorption of toxic and allergenic substances or to attack by microorganisms or consequently to toxic
30 or allergenic skin reactions.

To avoid the aforementioned skin problems, a large number of formulations for rough hand cleaners have been proposed in the patent literature. Thus, for
35 example, WO 99/06021 describes hydrous so-called "waterless hand cleaner" formulations which have a water content of from 75 to 99% by weight, up to 25% by weight of a fatty acid ester or mixtures of such

esters, and at least one surfactant. Compared with the
aforementioned products containing organic solvents,
such formulations constitute a significant improvement,
particularly from a toxicological point of view. Never-
5 theless, the improved skin compatibility and the
improved protection against the drying-out of skin was
accompanied by a loss in cleaning effect compared to
solvent-containing rough hand cleaners.

10 DE 197 48 921 A1 relates to hydrous liquid, pasty or
creamy hand cleaning compositions, in particular rough
hand cleaning compositions with an abrasive which have
a content of from 10 to 30% by weight of at least one
vegetable oil, selected from the group of triglyce-
15 rides, saturated and/or unsaturated fatty acids, of
from 10 to 30% by weight of at least one surfactant
from the group fatty alcohol ethoxylates, fatty alcohol
ether sulphates and/or castor oil sulphates, and also
10 to 65% by weight of water, in each case based on the
20 composition of the cleaning compositions. As rough hand
cleaners, these compositions comprise 1 to 30% by
weight of at least one abrasive in the composition. The
rough hand cleaners described therein are very highly
skin compatible from a dermatological point of view and
25 only have slight drying-out of the skin even upon
repeated daily use.

EP 1 152 051 A2 discloses skin-mild hand washing
pastes, fatty acid alkyl esters being used in combina-
30 tion with emulsifiers, preferably fatty alcohol
ethoxylates. The refatting agents used are additionally
partial glycerides. Although the refatting agents are
described extensively in this printed specification,
the examples refer only to emulsions with 20 to 30% by
35 weight of fatty acid esters and additionally 10% by
weight of a mixture of cocoglycosides and glyceryl
oleate (Lamesoft P065). It is to be assumed that the
refatting effect is based, similarly to the hand

cleaning compositions described in DE 197 48 921 C2, on the content of fatty acid esters. Nevertheless, the hand washing pastes according to EP 1 152 051 A2 also lead to drying-out of the skin upon frequent use.

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DE 199 16 036 A1 describes hand washing pastes comprising anionic surfactants, abrasive bodies and partial glycerides, in particular oleic acid monoglycerides, and the use of such partial glycerides for improving the skin feel. However, in the examples, only a mixture of cocoglycosides and glyceryl oleate (Lamesoft P065) is used. Although the hand washing pastes described in this laid-open specification are said to lead to a subjective improvement in skin feel, no experimental data for this are given which could demonstrate such an improvement in the skin condition.

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Nevertheless, even such a subjective improvement in skin feel upon frequent use of such rough hand cleaners is perceived by the users as skin-drying despite the fact that the rough hand cleaners according to DE 197 48 921 A1 contain up to 30% by weight of vegetable oils, preferably rapeseed oil as refatting agent or hydrophobic emollient. The same is true for EP 1 152 051 A1 which contain up to 40% by weight of fatty acid alkyl esters as hydrophobic emollient. Moreover, with regard to the formulations described in DE 199 16 036 A1 which contain partial glycerides, it is to be established that these lead to an increase in the drying-out of the skin upon frequent use.

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There is thus still a need for mild skin and hand cleaning compositions which ensure a very good cleaning effect even on the most stubborn of skin soilings, coupled with very good skin compatibility. In particular, these rough hand cleaners should produce a very good skin feel during washing, this very good skin impression on account of the slight drying-out of the

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skin remaining perceptible to the user for some time even after washing, and thus increasing the acceptance by the users with regard to the use of rough hand cleaners.

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It was therefore an object to provide such skin and hand cleaning compositions, in particular rough hand cleaning compositions. This object was surprisingly achieved by skin and hand cleaning compositions which have a content of at least 0.1% by weight of at least one hydrophilic emollient with an HLB value of ≥ 10 , polyol esters being particularly preferred as hydrophilic emollients.

15 It is essential to the invention for these skin and hand cleaning compositions that the hydrophilic emollients have an HLB value of ≥ 10 . The HLB value is a measure of the water solubility or oil solubility of predominantly nonionic surfactants and emulsifiers, for example in cosmetic products, and thus describes the hydrophilic part and the lipophilic part of a chemical compound. For example, an HLB value of 0 corresponds to a purely lipophilic compound. By contrast, a chemical compound with an HLB value of 20 has only hydrophilic parts. Thus, water-in-oil emulsions are assigned HLB values from 3 to 8, whereas oil-in-water emulsions have HLB values from 8 to 18, and detergents have HLB values from 13 to 15 (see also RÖMPP - Chemistry Lexicon, 10th edition, page 1764, keywords: HLB system, HLB value - and literature cited therein).

For the invention present here, emollients with an HLB value from 1 to 8 are referred to as hydrophobic, those with a value from 8 to 10 as neutral, and those with a value ≥ 10 as hydrophilic.

In contrast to the predominantly lipophilic emollients used hitherto in the prior art, the hydrophilic

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emollients according to the invention have an HLB of ≥ 10 , preferably ≥ 12 . For example, the mixture of cocoglycosides and glyceryl oleate (Lamesoft P065) described in DE 199 16 036 A1 has an HLB value of 9 and fatty acid esters have a yet significantly lower HLB value. It was therefore entirely surprising, although the hydrophilic emollients according to the invention are significantly more hydrophilic and thus also have significantly better solubility in water and are thus easier to wash off than the emollients used in the abovementioned prior art, i.e. it thus does not result in a refatting in the actual sense, that the skin feel after frequent use is subjectively not only described as less dry by the users, but the improved skin condition can also be quantified objectively by means of corneometer measurements, as will be shown in the experimental section.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 represents results of a Forearm Washing Test by a visual assessment of formulations B and C according to the invention and comparison formulations S and T.

FIG. 2 represents results of a Forearm Washing Test by use of a Corneometer of the same formulations shown in Fig. 1 in comparison to a control.

FIG. 3 represents results of a Forearm Washing Test of the same formulations shown in Fig. 2.

DETAILED DESCRIPTION OF THE INVENTION

According to the invention, the skin and hand cleaning compositions according to the invention preferably have a content, in each case based on the total composition of the cleaning composition, of the components

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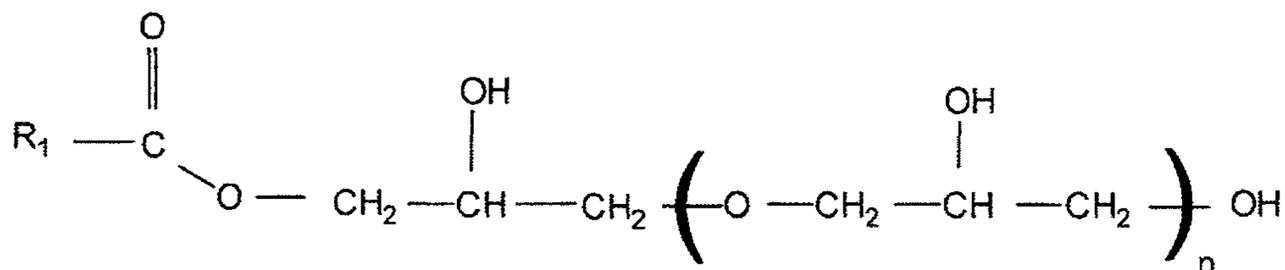
- a.) at least 0.1% by weight of at least one hydrophilic emollient, preferably a polyol ester,
- b.) 2 to 40% by weight of at least one surfactant selected from the group of fatty alcohol ethoxylates, fatty alcohol ether sulphates and salts of sulphated and/or sulphonated fatty acids,
- 5 c.) 30 to 90% by weight of water,
- d.) 0 to 30% by weight of one or more cleaning boosters selected from the group of polyols, polyethers, polyphosphates and phosphates,
- 10 e.) 0 to 30% by weight of one or more abrasives,
- f.) 0 to 1.0% by weight of propoxylated fatty alcohols,
- g.) if desired one or more viscosity-forming agents,

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h.) if desired further cosmetic auxiliaries, additives and/or active ingredients,

the sum of components a.) to h.) being 100% by weight.

The polyol esters to be used as component a.), which are to be regarded as hydrophilic emollient in the skin and hand cleaning compositions according to the invention, are, for example, partial glycerides, in particular polyglyceryl partial esters. According to the invention, preference is given to polyglyceryl partial esters of the general formula



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where

R_1 = linear, branched or cyclic, saturated or unsaturated alkyl or alkenyl radical having 6 to 18 carbon atoms and

n = an integer from 1 to 9.

The linear, branched or cyclic, saturated or unsaturated alkyl or alkenyl radical has in particular 6 to 16 and particularly preferably 8 to 12 carbon atoms, where preferably $n = 1$ to 5, in particular $n = 1$ to 3. Furthermore, it is also possible to use polyglycerol esters with another structure, e.g. based on 1,2- or 1,3-linked polyglycerols, and also polyglycerol ethers.

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The polyglyceryl partial esters or polyglycerol fatty acid esters particularly preferred according to the invention are, for example, polyglyceryl-3 caprate or polyglyceryl-4 caprate, which are available from

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Degussa under the names TEGOSOFT[®] PC31 and TEGOSOFT[®] PC41.

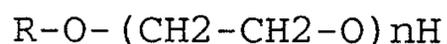
5 Polyol esters for the purposes of the present invention are furthermore polyethylene glycol esters, such as, for example, PEG-7 glyceryl cocoate, which is available from Croda Chemicals Europe Ltd. under the name Glycerox HE.

10 As hydrophilic emollients, component a.) in the skin and hand cleaning compositions according to the invention can also contain polysaccharide esters and/or polysaccharide ethers and/or polysaccharide glycosides with an HLB ≥ 10 , preferably ≥ 12 . Preference is given
15 to sucrose esters, as can be obtained, for example, from Degussa GmbH under the names TEGOSOFT[®] LSE 65 K and TEGOSOFT[®] LSE 65 K Soft.

The fraction of component a.) in the skin and hand
20 cleaning compositions according to the invention can be up to 10% by weight, preferably 0.1 to 5% by weight, particularly preferably 0.3 to 3% by weight, based on the composition of the cleaning composition. The hydrophilic emollients can be present on their own or in
25 multiples as component a.) in the skin and hand cleaning compositions according to the invention.

The fatty alcohol ethoxylates that can be used as component b.) preferably have the general formula

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where

R = saturated, unsaturated, branched or unbranched
35 alkyl radical,

n = an integer from 1 to 11.

As saturated, unsaturated, branched or unbranched alkyl radical, preference is given to using R = C₆ to C₁₈, in

particular C₁₀ to C₁₆ and particularly preferably C₁₁ to C₁₄, where preferably n = 3 to 6, in particular n = 5 to 7.

5 In the skin and hand cleaning compositions according to the invention, 2 to 40% by weight, preferably 3 to 20% by weight and particularly preferably 5 to 10% by weight, of fatty alcohol ethoxylates are present, based on the composition of the cleaning composition. In a
10 preferred embodiment, the skin and hand cleaning compositions according to the invention contain 5 to 10% by weight, based on the composition of the cleaning composition, of laureth-6 as fatty alcohol ethoxylate.

15 The fatty alcohol ether sulphates of component b) that can be selected are in particular those of the general formula



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where R = a C₈-C₁₈, preferably C₁₁-C₁₄, saturated or unsaturated, branched or unbranched alkyl radical, n = an integer from 1 to 6, preferably 1 to 4, and X = Na⁺, NH₄⁺ or Mg²⁺, where sodium lauryl ether sulphate (where R
25 = C₁₂, n = 2-3 and X = Na⁺) is particularly preferred.

According to the invention, the salts of sulphated and/or sulphonated fatty acids of component b.) used are alkali metal or alkaline earth metal salts of
30 C₈-C₃₀, preferably C₁₀-C₂₂ fatty acids, particularly preferably castor oil sulphates, in particular Na⁺ or NH₄⁺ sulphates. Such castor oil sulphonates are available, for example, under the names Monobrilliantöl[®] (Stockhausen GmbH, Krefeld) or
35 Standapol SCO[®] (Henkel KGaA, Düsseldorf).

The skin and hand cleaning compositions according to the invention which are free from organic solvents

contain 30 to 90% by weight, based on the composition of the cleaning composition, preferably 40 to 80% by weight and particularly preferably 45 to 75% by weight of water as component c.).

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Although the skin and hand cleaning compositions according to the invention exhibit a very good cleaning effect, such that the addition of cleaning boosters can be dispensed with, the skin and hand cleaning compositions can contain cleaning boosters from the class of polyols, polyethers, polyphosphates and phosphates as component d.) if desired for certain cleaning applications. Particular preference is given here to polyethers which are formed from the polymerization of ethylene glycol and 3 to 20 units, preferably 4 to 10 units. Preference is given to PEG-8, as can be obtained, for example, from Ineos under the name PEG 400. Furthermore, preference is given to polyphosphates, such as the pentasodium tripolyphosphate $\text{Na}_5\text{P}_3\text{O}_{10}$ (sodium tripolyphosphate), and the corresponding potassium and sodium potassium salts, which are available, for example, from BK Giulini.

The skin and hand cleaning compositions according to the invention exhibit a very good cleaning effect, such that the addition of abrasives to these cleaning compositions can be dispensed with. Nevertheless, the skin and hand cleaning composition can, if desired, contain abrasives as optional component e.) for certain cleaning applications. The fraction of abrasive or abrasives can then be 0 to 30% by weight, based on the composition of the cleaning composition, preferably 5 to 25% by weight, particularly preferably 5 to 25% by weight. Preferred abrasives to be used are, for example, synthetic abrasives based on polyethylene or polyurethane, abrasives based on natural kernel and/or shell flours, in particular walnut shell, almond shell, hazelnut shell, olive kernel, apricot kernel and cherry

kernel flour or any desired mixtures of these shell and kernel flours and beads made of waxes, such as, for example, jojoba waxes, walnut shell flour bleached with hydrogen peroxide being particularly preferred.

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Particular preference is given to the synergistic use of small amounts of propoxylated fatty alcohols as component f.) up to 1.0% by weight, based on the composition of the cleaning composition, with component a.).

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Use is made of propoxylated fatty alcohols, which are available as addition products of propylene oxide onto caproic alcohol, caprylic alcohol, 2-ethylhexyl alcohol, capric alcohol, lauryl alcohol, isotridecyl alcohol, myristyl alcohol, cetyl alcohol, palmoleyl alcohol, stearyl alcohol, isostearyl alcohol, oleyl alcohol, elaidyl alcohol, petroselinyl alcohol, arachyl alcohol, gadoleyl alcohol, behenyl alcohol and erucyl alcohol, and technical-grade mixtures thereof, in the form of their salts, in particular sodium and/or

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magnesium salts. Preference is given to the use of adducts of, on average, 1 to 20 mol of propylene oxide onto the desired fatty alcohols. According to the invention, particular preference is given to propoxylated fatty alcohols, as are available, for example, from Degussa GmbH under the name VARONIC[®] APS (PPG-11 stearyl ether) or VARONIC[®] APM (PPG-3 myristyl ether). 0.01 to 1% by weight, preferably 0.1 to 0.7% by weight, are used.

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Moreover, in a further embodiment of the invention, the skin and hand cleaning compositions according to the invention can if desired contain one or more viscosity-forming agents, such as, for example, organophilic and/or hydrophilic sheet silicates as component g.), in particular bentonites, polysaccharides, such as, for example, cellulose, guar flour and/or xanthans, modified polysaccharides, preferably cellulose ethers, carboxyalkylcellulose and/or hydroxyalkylcelluloses,

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preferably hydroxyethylcellulose and/or inorganic electrolytes, preferably sodium chloride and/or magnesium sulphate. According to the invention, particular preference as component g.) is given to
5 carboxymethylcelluloses (e.g. Walocel CRT - Wolff Cellulosics, Walsrode), which, moreover, bring about the very good foam-stabilizing effect while using the skin and hand cleaning compositions according to the invention. The skin and hand cleaning compositions
10 according to the invention particularly advantageously contain 0.1 to 1.5% by weight, based on the total composition of the cleaning composition.

Furthermore, the skin and hand cleaning compositions
15 according to the invention can if desired contain further cosmetic auxiliaries, additives and/or active ingredients, for example pH regulators, stabilizers, preferably cetearyl alcohol and/or hydrogenated castor oils such as, for example, trihydroxystearin,
20 fragrances, preservatives, preferably organic acids and antioxidants, such as, for example, vitamin E acetate, as component h.). Preferably, it is also possible to use oily or aqueous care components, such as, for example, bisabolol, aloe vera, panthenol, sodium PCA,
25 jojoba oil, creatine etc., in order to emphasize the care effect.

Moreover, the use of alkoxyated amides as component h.) is particularly advantageous, such as, for example, PEG-4 rapeseed amide (Amidet N - Biesterfeld
30 Spezialchemie GmbH, Hamburg), preferably 0.5 to 5% by weight, particularly preferably 1 to 4% by weight, based on the total composition of the cleaning composition as stabilizer.

35 The production of the skin and hand cleaning compositions according to the invention, in particular rough hand cleaners, usually takes place by means of known devices in a batch or continuous process, the

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skin and hand cleaning compositions preferably being
obtained as creamy compositions or as flowable viscous
pastes. Suitable devices are heatable vessels with
stirrer, continuous mixers such as extruders and
5 dispersers.

It has surprisingly been found that despite dispensing
with the use of hydrophobic emollients such as, for
example, vegetable oils in the case of the rough hand
10 cleaners according to DE 197 48 921 C2, through the use
of hydrophilic emollients corresponding to component
a.) in the skin and hand cleaning compositions
according to the invention, a significantly increased
skin care effect and also an improved skin impression
15 can be observed without thereby resulting in an
impairment of the cleaning effect.

The skin and hand cleaning compositions according to
the invention exhibit a very good cleaning effect,
20 coupled with very good skin compatibility and low
drying-out of the skin. It is particularly advantageous
that the skin and hand cleaning compositions according
to the invention produce a very good skin feel during
washing. Moreover, it was observed that even with
25 slight oil contamination, the skin and hand cleaning
compositions according to the invention foam to a
considerably greater degree than rough hand cleaners of
the prior art. The skin feel after washing is also
considerably more pleasant after some time on account
30 of the lower drying-out of the skin.

The invention is described by the following examples
and investigations, such as skin compatibility test
with the help of the Duhring chamber test, drying-out
35 of the skin using the corneometer and cleaning power
with the help of the hand washing test.

Test methods**Determination of the HLB value**

5 The HLB value is determined by preparing a 5% strength dispersion/solution of the substance to be tested, here the hydrophilic emollient, in water, and determining the solubility in water. The assessment takes place visually: clouding, solubility, degree of dispersion.

10 The HLB value is ascertained through comparison with solutions of emulsifiers whose HLB value is known.

Ascertained HLB values:

	- TEGOSOFT LSE 65 K soft	HLB: 12
15	- TEGOSOFT PC 31	HLB: 14
	- TEGOSOFT PC 41	HLB: 16
	- Lamesoft PO 65	HLB: 9

HLB values according to manufacturer:

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	- Glycerox HE	HLB: 11
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Duhring chamber test

25 The skin compatibility test takes place with the help of the Duhring chamber test according to P.J. Frosch, A.M. Kligman, Contact Dermatitis 5, page 73, 1979; modified according to J. Kresken, W.S. Wassilew, H+G4, page 334, 1992; A. Klotz, Am. J. Cont. Derm., 2001, 30 12(1), page 52 and A. Klotz, M. Veeger, Pharm. Ztg. 2000, 145(35), page 47 to 51.

35 This method is an in vivo test model for checking the skin compatibility of various test products in direct comparison. The products to be tested are applied on the subjects in air-impermeable aluminium chambers on the volar side of their forearms on 4 consecutive days on the same test area in each case. What is assessed is

skin irritations having formed, using the scale given below, and the application time 1 day after the last product application.

5 R = reddening (erythema): 0 = no erythema, 4 = severe erythema

S = scaling: 0 = no scaling, 4 = severe scaling

F = fissures: 0 = no fissures, 3 = severe fissures

10 The assessment criteria arising are the

1. Irritation \bar{x} as mean value of the sum of the irritation values R, S and F of n subjects

2. Application time \bar{h} as mean value of the tolerated application time in hours of n subjects.

15

From these two values it is possible to calculate the relative skin compatibility (A value) according to the following formula:

$$\bar{A} = \frac{\bar{h}}{\sqrt{\bar{x}}}$$

20

It is thus possible to describe a relation between the application time and the irritation having formed during this time by a value. The table below can be used as an aid for assessing the skin compatibility of

25 the tested products:

A value:

> 23	excellent skin compatibility
18-23	very good skin compatibility
30 13-18	good skin compatibility
8-13	satisfactory skin compatibility
3-8	adequate skin compatibility
< 3	inadequate skin compatibility

35

**Testing the drying-out of the skin using the
corneometer**

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The corneometer measurement is a noninvasive capacitive measurement method for assessing the moisture state of the uppermost skin layers of the Stratum corneum. In subjects with healthy skin, this is largely determined
5 by external influences.

Frequent cleaning of the skin leads to defatting of the skin and thus to a moisture reduction in the uppermost skin layers. Reduction in the moisture content of the
10 skin represents a deterioration of the skin condition and causes an increased risk of eczema. This effect can be detected by measuring techniques using the corneometer, e.g. CM 825 from Courage & Khazaka Electronic GmbH, Köln.

15

Prior to the start of the test, the starting values (C_0) are determined, and at the end of the test the end values are determined (C_n).

The change in the skin moisture C is calculated as
20 follows:

$$C = (C_n - C_0)$$

Negative values indicate an increase in skin moisture, positive values indicate a reduction in skin moisture.

25

Forearm washing test (FWT)

The forearm washing test (FWT) serves to test the skin compatibility of syndet preparations and hand cleaners. This test is particularly well suited for assessing
30 test products containing abrasives. On account of the mechanically caused rubbing on the forearm, the various abrasives and abrasive concentrations can be tested with regard to their skin irritation.

The test is designed to simulate conditions encountered
35 in practice and can follow a Duhring chamber test to verify the results.

On four consecutive days, controlled washings with the test products (0.5 g-1 g or 0.5 ml-1 ml syndet prepara-

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tions or abrasive-containing hand cleaners) are carried out on the sensitive skin of the volar forearm.

The test area is wetted with tap water and then the product to be tested is applied to the skin and massaged in on the forearm over a large area for a total of 2 minutes. The other fields are treated in the same way with the respective test product. Assessment of the skin reactions is undertaken daily prior to the first washing and on day 5.

Assessment takes place visually and is if desired assisted by objective noninvasive measurement methods (e.g. TEWL, Corneometer, D-Squames®).

- 0 = no reaction
- 1 = weak, spotted (punctiform) reddening, slight scaling
- 2 = moderate to medium reddening, slightly rough skin, average scaling
- 3 = severe reddening in the centre of the area, very rough skin, marked scaling, punctuated erosions

Testing the cleaning power with the help of the hand washing test

The test model of the hand washing test with standardized soiling or paint gives information about the cleaning effect of the products to be tested. For relevance in practice, it is necessary that all subjects have a characteristic skin structure on the palms of the hands caused by manual work. Using one product at a time, the following test is carried out in the morning and afternoon:

Test procedure with water:

- 0.5 g of soiling (model soiling, practice soiling or paint) is distributed on the palm and the back of the hand and rubbed in
- leave to dry for 1½ min

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- 1.2 g of cleaning composition are applied and rubbed in
- 1 ml of water is added and wash for 30 s
- add a further 1 ml of water and wash for 30 s
- 5 - rinse under cold running water
- visual assessment of the residual soiling (RS) on the back of the hand and the palm according to the scale, see below.

10 **Test procedure without water:**

- 0.5 g of soiling (model soiling, practice soiling or paint) are distributed on the palm and on the back of the hand and rubbed in
- 15 - leave to dry for 1½ min
- 1.2 g of cleaning composition are applied and rubbed in
- using a cellulose paper, the soiling on the hand surfaces is removed together with the product
- 20 - visual assessment of the residual soiling (RS) on the back of the hand and the palm according to the scale, see below.

0 = clean 5 = no cleaning effect (gradation in
25 steps of 0.5 possible)

The percentage cleaning effect is calculated according to the following formula:

30
$$\text{cleaning effect [\%]} = \frac{10 - (\overline{RS}_{palm} + \overline{RS}_{back})}{10} * 100\%$$

\overline{RS}_{palm} = mean value of the residual soiling on palms of n measurement series (subjects)

35 \overline{RS}_{back} = mean value of the residual soiling on backs of hands of n measurement series (subjects)

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Since the determination of the cleaning effect has a broader variation range, an absolute deviation of 5% between two measurement series is allowable.

5	Composition of a suitable model soiling:	
	Engine oil:	54.15%
	Vaseline:	18.05%
	Wool wax:	18.05%
	Graphite:	3.61%
10	Flame soot:	5.42%
	Iron oxide (Fe ₂ O ₃):	0.72%

Working examples:

15 Skin and hand cleaning compositions according to the compositions given in Table 1 were prepared by stirring together all of the components using the cold-cold, hot-cold or hot-hot methods customary in cosmetics up to at most 70°C. The compositions were characterized
20 with regard to their skin compatibility, drying-out of the skin and cleaning effect towards a model soiling and paint.

In the described skin compatibility test, the example
25 formulations A to P according to the invention have, compared to the solvent-free comparison formulation T, which is prepared according to DE 197 48 921 C2, a comparable, very good skin compatibility and, in the corneometer test, reduced drying-out of the skin after
30 cleaning. Comparison formulations S, which were prepared according to 199 16 036 A1, exhibited significantly poorer skin compatibility and higher skin drying-out values measured in accordance with FWT than the formulations A to J.

35

Moreover, the formulations A to J according to the invention exhibited a comparable very good cleaning effect in the described, standardized cleaning test in

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the comparison N towards a paint soiling and towards a model soiling.

The following lists specify ingredients of example 5 formulations according to the invention as well as control formulations described herein, according to INCI nomenclature.

Ingredients according to INCI nomenclature	A	B	C	D	E	F	G	H	I
AQUA (WATER)	57.3	60.5	60.2	57.0	58.9	48.7	65.8	71.4	76.0
JUGLANS REGIA SHELL POWDER	15.0	15.0	15.0	15.0	15.0	15.0	12.0	6.0	6.0
QUARTZ SAND									
Sodium carbonate									
Rapeseed oil									
Sodium lauryl sulphate									
LAURETH-6	9.0	6.0	6.0	9.9			6.0	6.0	6.0
LAURETH-5						9.0			
POLOXAMER 407 (EO/PO block polymer - Pluronic)					6.0				
ALKYL POLYGLUCOSIDE									
SODIUM LAURETH SULPHATE	3.1	3.1	3.1	3.1	5.0	3.0	3.3	3.3	6.0
SULPHATED CASTOR OIL	2.8	2.8	2.8	2.8	2.5	2.5	2.8	2.8	4.0
DISODIUM LAURETH SULPHOSUCCINATE	3.0	2.1	2.1	2.4	1.0	3.0	1.8	1.8	1.5
SODIUM COCOAMPHOACETATE					2.0				
DISODIUM PEG 4 COCAMIDO MIPA SULPHOSUCCINATE						1.0			

Ingredients according to INCI nomenclature	A	B	C	D	E	F	G	H	I
Cocoamidopropylbetaine									
COCAMIDE DEA									
PEG-4 RAPESEED AMIDE	2.0	1.5	1.5	1.5	1.5	2.0	2.0	2.0	1.5
SODIUM TRIPOLYPHOSPHATE	1.7	2.5	2.5	2.5	2.5				
PEG-8						10.0			
POLYGLYCERYL-3 CAPRATE (Tegosoft PC 31)	1.5		1.5	1.5	1.0	1.2	1.2	1.2	1.5
POLYGLYCERYL-4 CAPRATE (Tegosoft PC 41)									
SUCROSE COCOATE Tegosoft LSE-65K soft)		1.5							
PPG-11 STEARYL ETHER (Varonic APS)	0.3		0.3	0.3		0.3	0.3	0.3	0.2
PPG-3 MYRISTYL ETHER (Varonic APM)					0.3				
Coco-Glucoside and Glycerol Oleate (Lamesoft PO 65)									
CARBOXYMETHYLCELLULOSE	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
XANTHAN GUM					0.3				
Stearic acid									
SODIUM CHLORIDE	0.6	1.5	1.5	0.5	0.5	0.6	1.5	1.5	0.6
Oleic Acid							0.6	0.9	

Ingredients according to INCI nomenclature	A	B	C	D	E	F	G	H	I
SODIUM BENZOATE	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
POTASSIUM SORBATE	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
PERFUME (FRAGRANCE)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
CITRIC ACID	1.4	1.3	1.3	1.3	1.5	1.4	0.5	0.5	0.5
NaOH									
CI 77891 (titanium dioxide)	0.5	0.5	0.5	0.5	0.2	0.5	0.5	0.5	0.4

Ingredients according to INCI nomenclature	J	K	L	M	N	O	P
AQUA (WATER)	79.5	30.6	30.6	65.8	68.5	64.8	75.2
JUGLANS REGIA SHELL POWDER	0.0	30.0	20.0	12.0	8.0	12.0	0.0
QUARTZ SAND							
Sodium carbonate							
Rapeseed oil							
Sodium lauryl sulphate							
LAURETH-6	3.0	20.0	2.0	6.0	9.0	9.0	6.0
LAURETH-5							
POLOXAMER 407 (EO/PO block polymer - Pluronic)							
ALKYL POLYGLUCOSIDE							
SODIUM LAURETH SULPHATE	6.0	6.0	30.0	3.3	3.3	3.3	5.0
SULPHATED CASTOR OIL	4.0	4.0	8.0	2.8	2.8	2.8	2.5
DISODIUM LAURETH SULPHOSUCCINATE	1.5			1.8	1.8	1.8	3.0
SODIUM COCOAMPHOACETATE							
DISODIUM PEG 4 COCAMIDO MIPA SULPHOSUCCINATE							
Cocoamidopropylbetaine							
COCAMIDE DEA							
PEG-4 RAPESEED AMIDE	2.5	2.5	2.5	2.0	1.5	1.5	3.5

Ingredients according to INCI nomenclature	Q to B	R to G	S	T	U
AQUA (WATER)	59.0	64.9	35.7	40.9	56.6
JUGLANS REGIA SHELL POWDER	15.0	12.0		13.0	15.0
QUARTZ SAND			35.0		
Sodium carbonate			0.5		
Rapeseed oil				20	10
Sodium lauryl sulphate			20.0		
LAURETH-6	6.0	6.0		11.0	7.0
LAURETH-5					
POLOXAMER 407 (EO/PO block polymer - Pluronic)					
ALKYL POLYGLUCOSIDE			0.6		
SODIUM LAURETH SULPHATE	3.1	3.3	0.8	7.5	3.0
SULPHATED CASTOR OIL	2.8	2.8		2.1	3.5
DISODIUM LAURETH SULPHOSUCCINATE	2.1	1.8			
SODIUM COCOAMPHOACETATE					
DISODIUM PEG 4 COCAMIDO MIPA SULPHOSUCCINATE					
Cocoamidopropylbetaine			0.5		
COCAMIDE DEA			0.5		
PEG-4 RAPESEED AMIDE	1.5	2.0			

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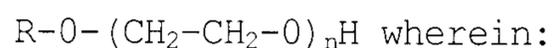
Ingredients according to INCI nomenclature	Q to B	R to G	S	T	U
SODIUM TRIPOLYPHOSPHATE	2.5				
PEG-8					
POLYGLYCERYL-3 CAPRATE (Tegosoft PC 31)					
POLYGLYCERYL-4 CAPRATE (Tegosoft PC 41)					
SUCROSE COCOATE Tegosoft LSE-65K soft)					
PPG-11 STEARYL ETHER (Varonic APS)					
PPG-3 MYRISTYL ETHER (Varonic APM)					
Coco-Glucoside and Glyceryl Oleate (Lamesoft PO 65)	3.0	2.4	5.0		
CARBOXYMETHYLCELLULOSE	0.6	0.7		0.7	0.7
XANTHAN GUM				0.3	0.3
Stearic acid			1.1		
SODIUM CHLORIDE	1.5	1.5		2.4	0.6
Oleic Acid		0.6			1.2
Sodium Benzoate	0.6	0.6		0.6	0.6
POTASSIUM SORBATE	0.3	0.3		0.3	0.3
PERFUME (FRAGRANCE)	0.2	0.2	0.2	0.2	0.2

Ingredients according to INCI nomenclature	Q to B	R to G	S	T	U
CITRIC ACID	1.3	0.5		0.6	0.6
NaOH			0.2		
CI 77891 (titanium dioxide)	0.5	0.5		0.4	0.4

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A composition comprising:
 - (a) at least 0.1% by weight of at least one polyol ester as a hydrophilic emollient with an HLB value of >10;
 - (b) 2 to 40% by weight of at least one surfactant which is a fatty alcohol ethoxylate, a fatty alcohol ether sulphate, or a salt of a sulphated or sulphonated fatty acid, or any combination thereof;
 - (c) 30 to 90% by weight of water;
 - (d) 0 to 30% by weight of one or at least one cleaning booster which is a polyol, polyether, polyphosphate or phosphate, or any combination thereof;
 - (e) 0 to 30% by weight of one or at least one abrasive;
 - (f) 0 to 1.0% by weight of propoxylated fatty alcohols;
 - (g) optionally one or at least one viscosity-forming agent; and
 - (h) optionally a cosmetic auxiliary, additive and/or active ingredient,the sum of components (a) to (h) being 100% by weight, wherein the at least one polyol ester is polyglyceryl-3 caprate and the propoxylated fatty alcohol is PPG-11 stearyl ether; or wherein the at least one polyol ester is sucrose cocoate.

2. The composition according to claim 1, wherein component (b) is at least one fatty alcohol ethoxylate of general formula:



R is a saturated, unsaturated, branched or unbranched alkyl radical, and

n is an integer from 1 to 11.

3. The composition according to claim 1 that contains 5 to 25% by weight of one or at least one abrasive as component (e).

4. The composition according to claim 2 that contains 5 to 25% by weight of one or at least one abrasive as component (e).

5. A cleaner for removing soiling from skin or hands comprising a composition as defined in any one of claims 1 to 4.

6. A method for removing soiling from the skin comprising:

contacting soiled skin with a composition as defined in any one of claims 1 to 4.

7. The method of claim 6, that comprises removing soiling from hands.

8. The method of claim 6, wherein said soiling is paint, fat, oil, a lubricant, metal dust, graphite or soot.

9. A composition comprising:

(a) 0.3 to 3% by weight of at least one polyol ester with an HLB value of ≥ 10 , which is a sucrose ester, polyglyceryl-3 caprate or polyglyceryl-4 caprate;

(b) 5% to 10% by weight of a fatty alcohol ethoxylate;

(c) 45% to 75% by weight of water;

(d) more than 0 and up to 30% by weight of a cleaning booster which is a polyphosphate and/or a polyether formed from the polymerization of 3 to 20 units of ethylene glycol;

(e) 5 to 25% by weight of one or at least one abrasive which is a polyethylene abrasive, a polyurethane abrasive, a natural kernel flour or powder, or a natural shell flour or powder, or any combination thereof;

(f) 0 to 1.0% by weight of propoxylated fatty alcohols,

(g) optionally one or at least one viscosity-forming agent, and

(h) optionally a cosmetic auxiliary, additive and/or active ingredient, the sum of components (a) to (h) being 100% by weight.

10. The composition of claim 9, wherein (a) is a sucrose ester.

11. The composition of claim 9, wherein (a) is sucrose cocoate.

12. The composition of claim 9, wherein (a) is polyglyceryl-3 caprate.

13. The composition of claim 9, wherein (a) is polyglyceryl-4 caprate.

14. The composition of claim 9, wherein (a) is 0.3% to 3% by weight polyglyceryl-3 caprate, (b) is 5% to 10% by weight laureth-6, (d) is sodium tripolyphosphate, (e) is walnut shell powder, (f) is 0.1% to 0.7% by weight of PPG-11 stearyl ether, and (h) is 1% to 4% PEG-4 rapeseed amide.

15. The composition of claim 9, wherein (a) is 0.3% to 3% by weight sucrose cocoate, (b) is 5% to 10% by weight laureth-6, (d) is sodium tripolyphosphate, and (e) is walnut shell powder, and (h) is 1% to 4% PEG-4 rapeseed amide.

16. The composition of claim 1, wherein polyglyceryl-3 caprate is used as component (a) and PPG-11 stearyl ether is present as component (f).

17. The composition of claim 1, wherein (a) is 0.3% to 3% by weight polyglyceryl-3 caprate, (b) is 5% to 10% by weight laureth-6, (d) is sodium tripolyphosphate, (e) is walnut shell powder, (f) is 0.1% to 0.7% by weight of PPG-11 stearyl ether, and (h) is 1% to 4% PEG-4 rapeseed amide.

Fig. 1

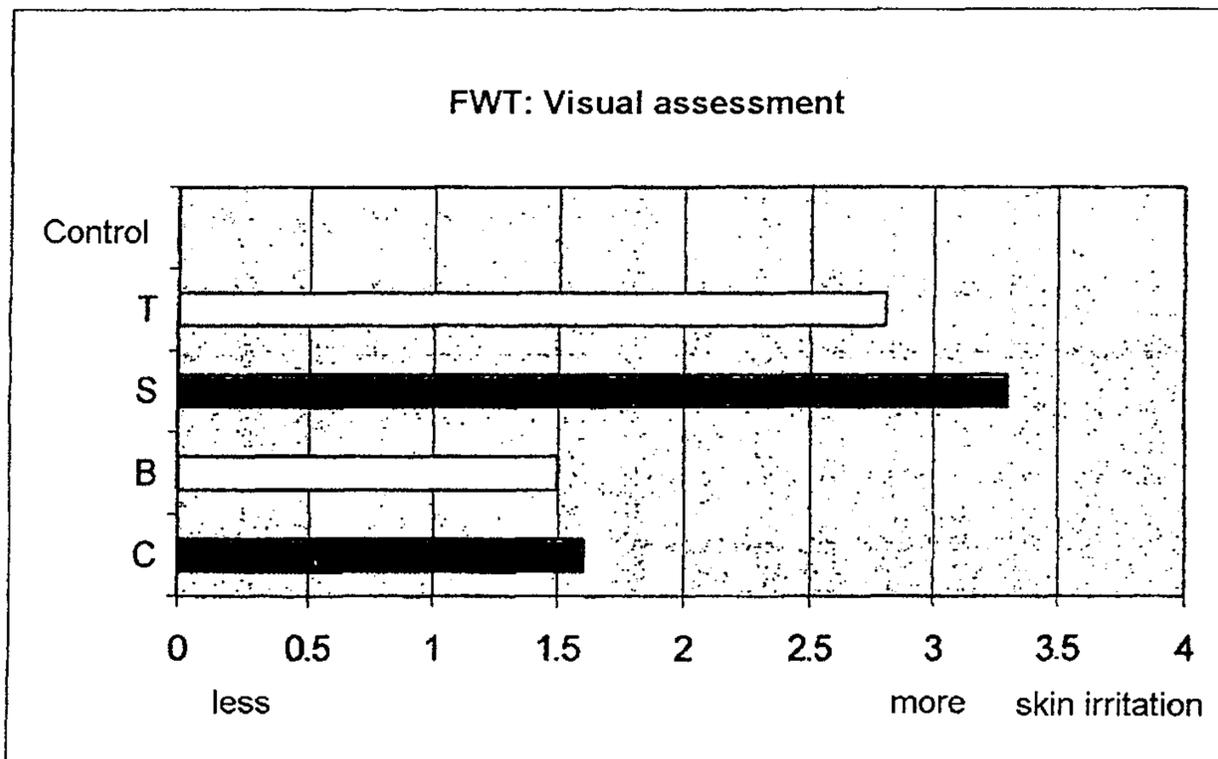


Fig. 2

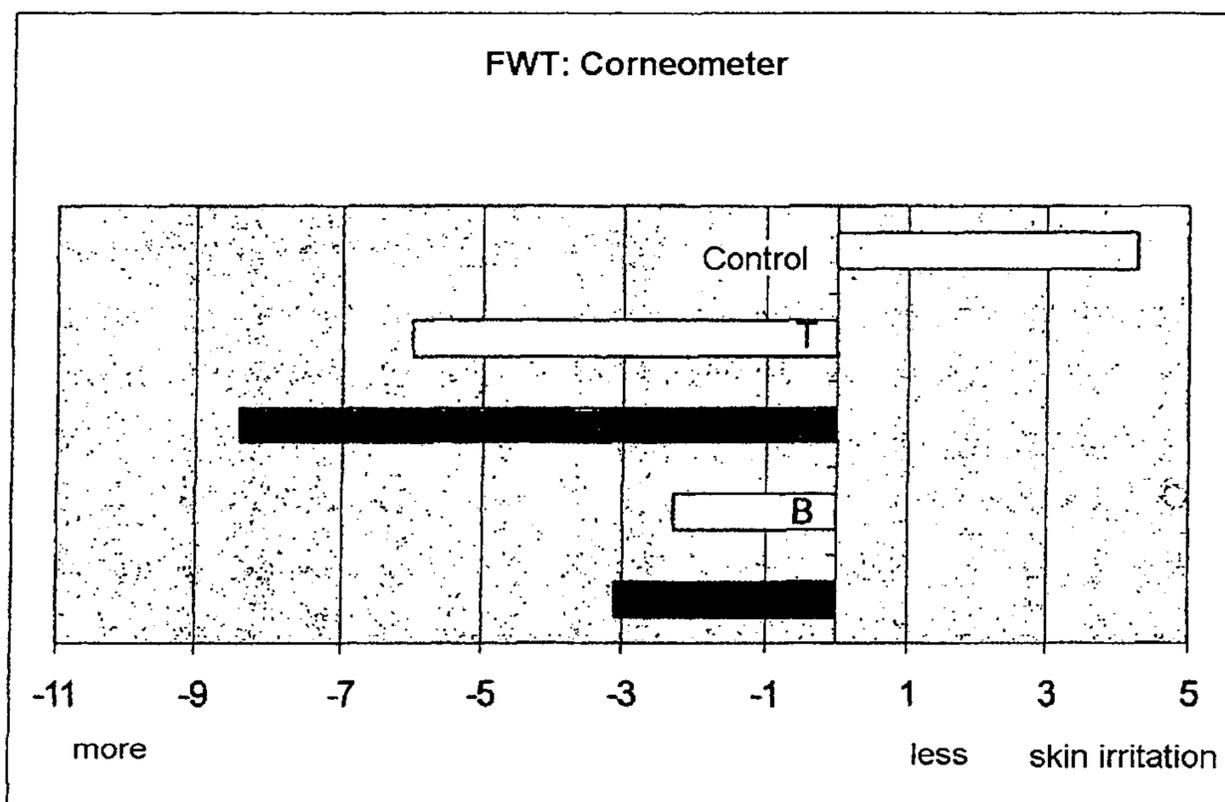


Fig. 3

