

ALIEN PROPERTY CUSTODIAN

CLEANING COMPOSITIONS IN PASTE-FORM

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This invention relates in general to cleaning compositions in paste-form and their method of production, and in particular to the process of incorporating these products into soap or soap-like compounds.

The alkali metal-, ammonium- and organic ammonium salts of phosphoric acids having a lower proportion of water molecules than orthophosphoric acid are known for their capacity of linking metal ions into complex state and thereby keeping in solution the salts of the alkaline earths in water, even in presence of specific precipitating agents. Therefore, they are extensively applied in various textile and washing processes, where they are added in powdered form to the aqueous liquor. For the same purposes are also suitable the nitrogen-phosphoric acid compounds obtained either by reacting gaseous ammonia with solid P_2O_5 or by heating urea and nitrogenous compounds, such as acid amides, nitriles, derivatives of carbamic acids or hexamethylene tetramine, with any phosphoric acid.

Furthermore, the washing power and the activating effect which these phosphates have on other washing agents have already been pointed out, for which reason they are frequently mixed with other washing agents and especially incorporated into soap, the added amount of phosphates being relatively small. As far as these washing agents are intended to clean the hands—in which case they cannot be employed for example in form of a mixed powder of any composition—they can only be prepared with a relatively small addition of phosphates. Thus it is technically impossible in the manufacture of solid soaps used for the cleaning of the hands to exceed an addition of 20% of phosphate, because otherwise the soap mass does not only lose its homogeneousness (homogeneity), but—in consequence of the high electrolytic properties of the phosphoric salts—also its lathering power. For this reason the specific cleaning capacity of the phosphates could not be completely utilized for cosmetic purposes.

Now the surprising discovery has been made that the water-soluble salts of phosphoric acids having a lower proportion of water molecules than orthophosphoric acid as well as the products obtained by reacting ammonia with P_2O_5 or by heating any phosphoric acid with an organic nitrogen compound, such as urea, acid amides, nitriles, derivatives of carbamic acid, hexamethylene, can be transformed by addition of a small amount of a dispersive-, emulsifying-, or washing-agent and a little water into pastes, in which form they are especially suitable for cosmetic purposes. The specific and surprising action of this composition becomes evident for example in cleaning one's hands from oily substances or fruit- and vegetable-juices. While at the use of

normal washing liquors or those containing a small amount of phosphates having a low proportion of water molecules the colourings caused by fruits or vegetables and deeply penetrated into the skin can only be removed by long washing, the desired effect is obtained with the products according to the present invention within a short time.

As emulsifying- or dispersive-agents for the conversion of the mentioned phosphates into paste-form are suitable in first line the colloidal organic washing agents of high molecular weight, such as soap, i. e. the alkali metal salts of fatty acids of higher molecular weight, sulphuric acid esters, as well as pure sulphonic acids of fats, oils, waxes, and fatty alcohols, products of condensation from fatty acids of higher molecular weight with oxyalkyl sulphonic acids, such as oleyl oxyethane sulphonic acid sodium, oleyl-methylaminoethyl sulphonic acid sodium, proteins of high molecular weight, polyglycol ethers of aromatic and hydro aromatic hydroxyl compounds which are substituted in the nucleus by at least one hydro carbon or alkyl radical containing at least 4 carbon atoms, and the like. But also starch, cellulose ethers, pectins, kaolin, bentonite, as well as synthetic substances easily swelling or colloidal-soluble in water, such as polyvinyl alcohol, may be employed. Thus the mixture can be adjusted either alkaline or neutral or acid according to requirement. For the cleaning of very oily objects it is recommendable to add to the paste fat-dissolving agents.

By "small amounts" of an emulsifying or dispersive agent in the sense of the present invention are understood about 10%, calculated on the phosphate.

The pastes according to the present invention can also be manufactured to solid, moulded washing agents. Up to now just the incorporation of phosphates into washing agents, especially into the soap mass, met with some difficulties. There is, for instance, a disadvantage in the manufacture of phosphate-containing soaps from highly dried soap chips as they are used in the production of toilet soaps and soap flakes owing to the phosphate solution frequently not being uniformly absorbed by the soap. The result is a crevassed, stained and mean-looking soap. Up to now it was therefore necessary to keep the phosphate additions within narrow limits and to mix them very thoroughly and carefully with the soap mass.

Another difficulty in the manufacture of soap with anhydrous phosphates still encountered is that through adding a slightly alkaline phosphate solution to soap, the pH-value of the mixed product sinks down into the acid range, thus leading to rancidity of the soap.

Finally, it always seemed detrimental to the

manufacturers of washing agents that the added phosphates dissolve but very slowly and with difficulty in small quantities of water. The consequence was either that the incorporation of phosphates was omitted or that undissolved phosphate parts or crystals came into the soap mass.

These disadvantages can, however, be easily avoided if the phosphates having a low proportion of water molecules or the nitrogen-phosphoric acid compounds are incorporated in form of the above-mentioned paste. The process is carried out as follows: To a highly concentrated phosphate solution are added under stirring about 10% of a hot aqueous soap solution. The paste now forming contrary to the soap-phosphate mixtures used up to now can be designed as a soap in phosphate solution. This paste can be thoroughly mixed with any dry soap mass by which it is absorbed completely and homogeneously. The mixture adjusted to the desired pH-value, remains constant at the following incorporation into the chief soap mass.

Example 1.—18 kg of sodium hexametaphosphate are dissolved in 18 litres of water to which solution are added under intense stirring

	Kilograms
Swelled starch.....	1,5
Sodium silicate with 5 molecules of water of crystallization.....	0,8
Caustic soda lye of 38° Bé.....	0,3
Titanic white.....	0,1

Example 2.—To a highly concentrated aqueous solution of 10 kg of sodium tripolyphosphate are added 1 kg of soap and 0,3 kg of caustic soda lye; this mass is stirred in a mixing apparatus (vessel) until a homogeneous paste is obtained.

Example 3.—20 parts of a nitrogen-phosphoric acid compound obtained by heating beyond 140° 80 parts of metaphosphoric acid with 60 parts of urea are dissolved in a little water and mixed with 3 parts of the sodium salt of an acid ester of sulphuric acid of the oleic alcohol to a homogeneous paste.

Example 4.—10 parts of sodium pyrophosphate, dissolved in water, are stirred with 0,5 part of sodium metasilicate, 0,2 part of caustic soda lye of 40° Bé, 5 parts of cyclohexanol and 1 part of isooctyl phenyl tetra glycol ether until a homogeneous mass is obtained.

Example 5.—9 parts of sodium hexametaphosphate are dissolved under stirring in 9 parts of water and then adjusted by means of concentrated caustic soda lye to a pH-value of about 10. This solution is mixed with 2 parts of a 50%, warm solution of soda soap and 0,4 part of anhydrous sodium metasilicate and thoroughly kneaded in a kneading machine. The pH-value is then about 10. This mass can be worked without difficulties as well with the soap paste (glue) as with highly dried soap chips, resulting after short mixing a homogeneous soap mass.

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