

ALIEN PROPERTY CUSTODIAN

METHOD OF WASHING WHITE AND COLOURED TEXTILE MATERIAL

Anton Volz, Ludwigshafen am Rhein, Germany;
vested in the Alien Property Custodian

No Drawing. Application filed January 8, 1940

This invention relates to the treatment of white and coloured linen or textile material to be washed.

It is known that additions of phosphate to soap, fatty alcohol sulfonates or condensation products of fatty acids aid in the washing process. Their efficiency is mainly due to the fact that the lather producing power and yield of these washing mediums is increased and that a higher dispersing and emulsifying effect is obtained. Also, in case of polymerized phosphates, the lime salts are maintained in solution and, in case of other phosphates, the pH-value is buffered. However, it was not hitherto possible to clean white linen in a satisfactory manner by these combinations without the cooperation of alkali, or the conditions had to be selected in a very special manner, respectively.

It has now been found that an excellent washing effect with respect to white and coloured linen can be obtained with washing materials the solubility of which in water is not due to ionogene groups but, for example, to OH-groups, additions of hexametaphosphates or polyphosphate, pyrophosphate, subphosphate or the corresponding thiophosphates at a predetermined pH-value which is preferably 6.1 to 8.0, while in case of the same pH-value, but without the said additions of phosphate the washing materials are practically inefficient. This fact is very striking since an addition of mono-, di- or trisodium phosphate in the same pH-range does not produce a similar increase of the washing power. Similarly, it is not possible by the use of washing mediums which are free from ionogen groups, plus soda, with or without the phosphate admixture according to the invention, to obtain the same good washing power as in the presence of these phosphates and without soda. Therefore a novel effect is clearly produced by the mixture of the said washing materials, comprising amongst others the aryl- or alcy polyglycol ethers, with the phosphates according to the invention.

The method according to the invention offers the advantage that cotton and cellulose wool as well as artificial silk can be washed with minimum swelling and without detrimental effects to dye-stuffs which are sensible and tend to run away, even in the presence of wool, silk and artificial fibres of albumen raw material, which are sensitive to alkali. This preserving or tender treatment is also of very great importance for the repeated washing of cellulose wool, since the

resistance of linen of cellulose wool to washing is thereby increased very much.

Example 1

50 kgs of linen are washed in 200 liters water with admixtures of 2 grams/liter of a polyglycol ether (of the type available under the trade name Igepal) and 1 gram/liter of sodium hexametaphosphate. The temperature is gradually increased from 20° C to 80° C during the washing operation and the linen is then rinsed. The pH-value is 6.3.

Soft or hard water may be used for the washing process. By way of alternative, potassium, sodium and amino salts of the pyrophosphoric acid; of the polyphosphoric acid and of the subphosphoric acid, alone or mixed together, may be used instead of the above mentioned sodium hexametaphosphate. Also, it may be advantageous under certain circumstances to mix polyglycol ether and phosphate beforehand, by purely mechanical or atomizing methods.

Example 2

A bleached cotton frotté containing cellulose wool, which is soiled by gelatine, pearl ink, tea and olein is washed with a liquor containing 2 grams/liter of an alcy polyglycol ether, such as, for instance, Leonil O, and 1 gram/liter of sodium hexametaphosphate, at a temperature of 20 to 80° C. The pH-value of the liquor amounts to 6.1.

Substituting 1 gram/liter soda instead of sodium hexametaphosphate, a bad cleaning effect is obtained; also an unsatisfactory cleaning is obtained with a liquor comprising 2 grams/liter Leonil O, 1 gram/liter soda + 1 gram/liter sodium hexametaphosphate.

According to a further modification of this washing method oxygenous or oxygen-producing substances are admixed to the washing liquor, whereby there is obtained not only a very good washing effect, but also an excellent degree of whiteness. In this case instead of the above mentioned phosphate proper, the additive compounds of the phosphates are advantageously used, such as, the salts of the perpyrophosphoric acid, of the permetaphosphoric acid or the polyphosphoric acid, or mixtures of the above mentioned phosphates with oxygenous substances, such as, for example, perborates, percarbonates, persulfates, persilicates and the like are admixed to the non-ionogen washing material.

Hitherto, oxygenous or oxygen-producing me-

diums have been admixed only to washing liquors having a pH-value of 9 or more, for washing and cleaning purposes. Moreover, it was required to add stabilizers to the washing mediums, for attaining a high degree of whiteness. The process according to the present invention, however, renders it possible to use oxygenous mediums also in washing liquors having a pH-value of less than 8, and renders the admixture of stabilizers unnecessary.

The washing mediums to be used in the novel washing process according to the invention may be produced in this manner that the components are intimately mixed together and put on the market in the form of a paste. According to a preferred form of the invention, however, the components are converted into a powdery product, by atomizing or dry rolling and in this case the components may either be mixed first and then atomized, or fed to the roller drying mill as a mixture or the components may be combined in the required proportions at a point shortly before the nozzle or the roller feeding device.

It is also possible to produce the novel ingredients by adding the oxygen to the initial products which are dissolved or mixed, i. e. the non-ionogen detergent and the phosphate anhydride, for instance, by adding hydrogen peroxide, sodium peroxide or similar per-compounds to said components. If a pH-value of about 7 or less is maintained in this process, oxygenous compositions are obtained which are very stable even in a liquid or pasty condition.

Example 3

25 kgs of linen are washed in a washing bath of 100 liters containing 2 grams isooctyl phenyl polyglycol ether and 1.5 grams of sodium polyphosphate per liter. The washing bath which

is at first at room temperature is gradually heated to 80° and the material to be washed is then rinsed as usual. The pH-value of the bath amounts to 6.8. By way of alternative, an alkali perpyrophosphate or an alkali permetaphosphate may be used instead of sodium polyphosphate.

Example 4

In order to wash 25 kgs of cotton texture, a washing liquor is prepared in which 200 grams dodecyl phenyl polyglycol ether, 20 grams of sodium perborate and 100 grams of sodium pyrophosphate are added per 100 liters water. The washing and rinsing operations are carried out in the usual manner. The material to be washed will then show a very high degree of whiteness, even in case of a very intensive initial soiling.

By way of alternative, perpyro-, perpoly- or permetaphosphate may be used instead of pyrophosphate in the mixture with sodium perborate.

Example 5

In order to wash artificially soiled frotté strips, a washing bath is produced containing 2 grams dodecyl phenyl polyglycol ether, 1 gram sodium polyphosphate ($\text{Na}_5\text{P}_3\text{O}_{10}$) and 1 gram potassium persulfate per liter and having a pH-value of 6.9 to 7.1. By washing the material with this liquor a higher degree of whiteness is obtained than with a liquor containing no potassium persulfate.

The method of the present invention has been described in detail with reference to specific embodiments. It is to be understood, however, that the invention is not limited by such specific reference but is broader in scope and capable of other embodiments than those specifically described.

ANTON VOLZ.