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DETERGENT COMPOSITION

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It is a known fact that we may add the alkaline salts of phosphoric acid, and above all the tri-sodium phosphate, to soaps and wash-powders partly as diluents and filling materials, partly with the intention of increasing the cleaning effect. It is further a known fact that for the same purpose soaps may also be used in combination with a whole line of organic sulphonic acids. We have known for instance for quite a number of years of soap and wash-powders which contain sodium tetra-hydronaphthalene sulfonate. Furthermore, we have known soaps of a solid, semi-solid or liquid form to which have been added sulfonated castor oil, etc.

The alkaline phosphate salts, to be sure, possess a strong solvent power for fats and oils and accordingly also for grease. However, if added to a soap body, they are neither able to increase the lather and emulsive power of the soap nor do they increase the wetting-out or adsorption power of the washing water to a worthwhile degree.

The organic sulfonic acids and their salts and above all the sulfo salts of the hydrogenated polynuclear aromatic hydrocarbons and the sulfo derivatives of castor oil are no doubt emulsifying agents. They are also better suited as far as the aliphatic character of the fatty acids is concerned, which are used for the production of soaps, than the alkaline phosphate salts. If added within moderate limits to a soap, they are also likely to exert a favorable influence upon the lathering property of the soap; they even have the property of increasing this lathering power to a considerable extent.

It has now been found that it comes as a surprise, that one could obtain an extraordinarily high washing effect by combining, not as has hitherto been done only with the alkaline phosphate salts or the sulfonates of organic bodies, but, both of them into a combination with any soap. This unexpected effect is clearly apparent if we add to a washing agent, or soap powder containing a quantity of soda ash, a mixture, let us say of about 10% of the agent or powder consisting of about 2 parts of tri-sodium phosphate and 1 part of sodium tetra-hydronaphthalene sulfonate. Let us suppose that the lather scale reading of an aqueous washing powder solution of 1½% amounts to 250. If prior to its being dissolved, we add to the washing powder 10% of tri-sodium phosphate, we will find that the lather scale reading of the solution falls down to 230. If we add, however, 10% of sodium tetra-hydronaphthalene sulfonate, it will rise to 280. However, if we add to it a mixture consisting of 2 parts of tri-sodium phosphate and 1 part of the same sulfonic salt, we will find that the lather scale reading has risen to over 300. Concurrently with this increase in the lather scale value, we also find a corresponding increase in the wetting-out, emulsifying and adsorption power of the solution, and with it its real washing effect which is far superior to that of a normal wash water.

It would only be in an emergency that we would add the two ingredients, namely the alkali phosphate salts and the sulfonates of organic compounds in a simple mixture to a soap body. We prefer rather to heat the mixture to an elevated temperature for some time with a resultant melting together, since tests made have demonstrated the fact that the chemical actions playing such an important role in bringing about the effect, tend to manifest themselves in a considerably more pronounced degree.

These tests however have also demonstrated the fact that it is of practical value to heat the two ingredients, namely the phosphate and the sulfonate only in the presence of a higher molecular alcohol, as for instance terpineol. As the result of such procedure the wetting-out and emulsifying power of the combination is further increased to a considerable degree. If we mix for instance 35 parts of an 80% Turkey-red oil with 15 parts of terpineol and add to this mixture another 50 parts of tri-sodium phosphate, we will get, after having heated up the entire mass for a short time, a semi-solid salty product which when cooled off yields a product completely soluble in water and having the property of giving to all soaps compounded therewith a strong wetting-out power which is of great importance in some cases, for instance when raw cotton that offers difficulties with respect to wetting is to be cleaned.

If we add to the heated mixture of the phosphate and the sulfonate, that is of the phosphate, sulfonate and alcohol, certain quantities of a calcined salt as for instance soda ash or calcined sodium sulfate, we will find that the entire mass when cooled off solidifies into a solid grindable mass, and those grindable products derived in this manner may then easily be compounded with all kinds of soap materials.

We may for instance mix one powder or another for the production of kitchen soaps, with the soap nucleus that has been freed from excess of potash. They also may be combined in the same manner with a soap paste, whereas for the

production of high grade soaps we would incorporate in the above combination coloring matter and scented substances by use of a mixing machine, or when the production of soap flakes is intended, by the use of a flake-making machine. For the production of cold stirred soaps, it is best to mix the powders with the oil before adding to it the caustic soda lye. We may obtain extraordinary advantages when we use one of the two powders as described above in the production of soft potash soaps, regardless as to whether the latter are to be produced as an oil soap or as a more or less white soap. If we add 5–10% of one of the two powders for instance to a basic potash soap made and boiled in equal parts of tallow and cocoanut oil, we will find that the entire mass when cooled off, solidifies into a cut-proof green soap which may readily be utilized and easily shipped in individual packages, and which with regard to its lathering property and washing power as compared with the hitherto known potash soaps is of a decidedly superior quality. Especially when employed as fulling soaps and washing agents for textiles of sensitive colors, we may consider these neutral strongly lathering potash green soaps as highly important. It is understood that we may also use this compound with great success in the production of solid potash soaps in the form of cakes or chips.

In contrast with the diluents and loading agents hitherto used in soap industry and which may be considered nothing but superfluous inactive substances, a combination of alkaline phosphate salts and higher molecular aliphatic or aromatic sulfonic acids with or without the addition of a higher molecular alcohol added to soaps produce high grade cleansing agents and wash powders which may not only be used to great advantage in the household and textile industry but which also serve as highly effective cleaning agents wherever fats, oils and greases are to be removed, as for instance in the iron industry, in mines, ore-fields, automobile factories, repair shops, garages, gas works, etc.

I claim:—

1. A detergent comprising a soap, together with a mixture of two parts of tri-sodium phosphate and one part of tetra-hydronaphthalenesulphonate of sodium.

2. A detergent, as defined in the preceding claim, in which the mixture of tri-sodium phosphate and tetra-hydronaphthalenesulphonate of sodium constitutes approximately 10% of the whole.

3. A detergent comprising a soap and a mixture of thirty-five parts of Turkey-red oil, fifteen parts terpineol and fifty parts of tri-sodium phosphate melted together.

4. A detergent comprising a soap and a mixture of Turkey-red oil and terpineol together with a substantial proportion of tri-sodium phosphate.

5. A detergent comprising a soap and a mixture of Turkey-red oil and terpineol combined in a proportion approximating 2 to 1 together with a substantial proportion of tri-sodium phosphate.

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