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Description

Technical Field

The present invention relates to a novel, particulate laundry detergent composition which contains no, or reduced levels of inorganic phosphate compounds. Furthermore, it relates to a particulate base material suitable for use in such detergent compositions and to a method of manufacturing this particulate base material.

Background of the Invention

Conventional laundry detergent compositions contain phosphate compounds, especially sodium tripolyphosphate (STP), as building agents. Owing to the negative effects of phosphates on the environment, there has been an increasing interest in developing new laundry detergent compositions which have a low or zero phosphate content. However, it has proved to be difficult to match the excellent builder properties of the phosphate-containing compositions.

It is known to use zeolites as builder in zero-P laundry detergent formulations. However, the application of zeolites in laundry detergent formulations has a number of drawbacks. In the first place, zeolites have a tendency to cause a bad powder structure. Further more, they tend to interact with silicates which are usually present in the composition as anti-corrosion agents, and they can cause dispensing problems in the washing machine and incrustation on the washed fabrics.

Definition of the Invention

We have now found that in accordance with the present invention a new low- or zero-P particulate laundry detergent composition can be provided, without the need for zeolites. The compositions of the invention utilise acid soap both as a powder base and as a builder.

The composition according to the invention comprises as a first particulate material a fatty acid mixture in which up to 35 mole% may be unsaturated fatty acids, which mixture has been neutralised to an extent of 25-60 mole %, and as a second particulate material a base in an amount sufficient to render the pH of the composition at a 0.5 wt% concentration in water higher than 8.

Optionally conventional detergent additives may be present, such as a bleach system, proteolytic enzymes, anti-foaming agents, optical brighteners, perfumes, anti-corrosion additives, etc.

The composition according to the invention exhibits very satisfactory wash performance without the need for phosphate or zeolite builders, although the presence of low levels of these materials is not prohibited and may be beneficial. Powder properties such as flow and compressibility are also excellent. The particulate laundry detergent composition according to the invention preferably contains 30-80 wt.% of granular acid soap particles.

The acid soap is a mixture of free fatty acids and soap, or a partially neutralized mixture of fatty acids. In principle, a wide range of saturated and/or unsaturated fatty acids may be used, but it was found that the powder properties of the particulate composition become less favourable at a content of unsaturated fatty acids of more than 35 mole%. More specifically, such powders tend to be sticky and are barely free-flowing. The lower the proportion of saturated fatty acid of chain length <C14 present, the greater the proportion of unsaturated fatty acids that can be tolerated.

Preferably, the mixture of fatty acid consists essentially of 5 - 20 mole% C16-C18 unsaturated fatty acids, and 95 - 80 mole% of a mixture of C8-C14 saturated fatty acids and C16-C18 saturated fatty acids in a ratio of 3:1-1:2.

For the purpose of this invention, the following definitions will be used: C8-C14 saturated fatty acids will also be referred to as laurics, C14-C16 saturated fatty acids as stearics and C16-C18 unsaturated fatty acids as oleics.

In the mixture of fatty acids, the C16-C18 saturated fatty acids or stearics are mainly responsible for the builder properties, while they contribute little to detergency. The C16-C18 unsaturated fatty acids or oleics are important for their builder properties but especially for detergency. The C8-C14 saturated fatty acids or laurics contribute both to the building and to the detergency, but their main function is to facilitate processing of the soap/fatty acid mixture, and to ensure adequate dissolution properties.

The laundry detergent compositions according to the present invention can be prepared by dry-mixing the various ingredients into a suitable mixture.

According to the invention, the acid soap is used in the form of a particulate material, for example, prills or noodles. Particle size and shape may be chosen at will and are discussed in more detail below. These acid soap particles can be prepared by dissolving a suitable amount of soap in a mixture of fatty acid in the molten state, followed by solidification and processing of the solid mass. Alternatively, they can be prepared by partial in situ saponification or neutralization of a mixture of fatty acids. In this process, a solid base material is gradually admixed with the molten fatty acid mixture. Suitable basic compounds are, for example, soda ash (sodium carbonate), sodium disilicate or metasilicate, or sodium hydroxide. When soda ash is used, only C02 is formed as a by-product, which is easily removed from the reaction mixture. When using sodium alkaline silicates, the formation of insoluble silicates may lead to a higher viscosity of the molten soap/fatty acid mixture. On the other hand, incorporation of silicates directly in the soap/fatty acid matrix is advantageous for the powder structure, and problems associated with the dry mixing of silicates as such are avoided. The operating temperature required to process these mixtures increases with the fatty acid chain length and degree of neutralization, and is preferably within the range of 70-140 °C.

Furthermore, the detergent composition of the present invention contains a particulate base in an amount sufficient to render the pH of the composition, at a 0.5 wt.% concentration in water, higher than 8. As a base material, in principle any base can be used which can be prepared in a particulate form and which readily dissolves in water without forming precipitates with the soap fatty acid particles. Preferably, the same base is used as for the partial neutralization of the fatty acid mixture.

The laundry detergent composition according to the invention may additionally contain other detergent compounds, such as anionic and/or nonionic non-soap detergent-active compounds. These may be incorporated in the particulate acid soap base, or present as a separate ingredient. The acid soap particles may contain up to 10% by weight of anionic and/or nonionic surfactant: higher levels can be detrimental to powder properties.

Alternatively or additionally, anionic or nonionic surfactants, but especially nonionic surfactants, may be carried on a porous inorganic material which is admixed with the acid soap particles. An example of such an adjunct is a liquid ethoxylated C13-C15 alcohol sprayed on to a Burkeite carrier. If the inorganic carrier is a basic material, the adjunct may serve as the basic component (second particulate material) of the composition.

A particularly preferred method of preparing acid soap particles was found to be spray-cooling. It was found thereby that particles or prills are obtained with excellent properties with regard to the dissolution rate, stability and to wash performance of the complete detergent composition.

Using the spray-cooling process, prills of any desired size and bulk density can be obtained by manipulation of the process conditions. Prills of average particle size 250-1000 m and buk density 400-750 g/e are preferred for compatibility with the other solid ingredients of the compsition, so that segregation in the pack is minimised.

When following the soap/fatty acid spray-cooling route, apart from the builder/active and solubility requirements, a number of additional factors should be considered:

1. To ensure adequate handling and storage properties, the soap/fatty acid-mixture should be sufficiently solid at temperatures below 35-40 °C.
2. For processing reasons, complete liquefaction should preferably be possible below 100 °C. In practice, this means a maximum mixing temperature <150 °C. It was found that meeting this requirement means that the soap content of the mixture should be limited to 25-60 mole%, depending on the fatty acid composition.
3. The composition of the mixture, in terms of fatty acid types and degree of neutralization, should be such as to ensure adequate solubility at low wash temperatures, i.e. in the 20-40 °C region.

It will be clear to the man skilled in the art that these requirements are not easy to fulfil at the same time. A number of characteristics of soap/fatty acid mixtures have to be considered.

Firstly, soaps as well as fatty acids may form various eutectic complexes; such complexes may also be formed between soaps and fatty acids, resulting in highly complicated phase diagrams for such mixtures. This aspect is particularly relevant to the question of meeting the 35-40 °C target for the solidification temperature. In addition, it was found that preferably the relative amounts of laurics and stearics should not exceed a 1:1 ratio; nevertheless, some liquefaction at the eutectic temperature of about 33 °C cannot be avoided. Although not ideal from a handling/stability point of view, the presence of some low melting laurics/stearics complex may be expected to have a favourable effect on the low temperature solubility.

Secondly, a further complication arises from the phenomenon of metathesis; addition of soap to a fatty acid mixture will lead to equilibration reactions, resulting in the presence of soap and free acids for all chain length homologues in a specific ratio, depending on the reactivity of the individual acids. Fortunately, the reactivities of unsaturated and saturated acids differ to such an extent that in a practical situation in these

mixtures, the oleics will be preferentially converted into soap. Significant amounts of lauric soap and stearic soap can only present when the proportion of soap exceeds that of oleate.

The invention will now be illustrated by the following Examples.

EXAMPLES 1-3

A number of fatty acid mixtures were prepared, having the compositions shown in Table A. The mixtures were then heated and at approximately 65 °C they began to melt. Heating was continued and after complete melting at a temperature of about 80 °C soda ash (sodium carbonate) was gradually added in an amount of 0.1 kg/min to control the CO2-evolution until the desired degree of neutralization had been reached. At the same time, the temperature was gradually raised to approximately 140 °C.

Subsequently, the partially neutralized fatty acid mixture was allowed to cool until solidification had occurred. The solid mass was noodled, using a sodium press. Noodles having a diameter of 1 mm and a length of about 5 mm were obtained. The properties of the noodles and the handling properties are shown in Table A. The solubility was measured as follows: The rate of dissolution of the soap/fatty acid noodles was determined by monitoring the increase in conductivity resulting from dissolution of the soap part of the noodles. In this method, 3 g/l of the sample is added to 1 l demineralized water at 25 °C with continuous stirring, using a magnetic stirrer. The rate of dissolution is expressed as the time required to dissolve 50% of the soluble part of the soap/fatty acid blend ($t_{\frac{1}{2}}$) . The maximum conductivity is measured after heating to above the melting temperature of the fatty acids, followed by cooling down to ambient temperature.

It follows from Table A that the handling properties of the noodles were good, while satisfactory solubility was observed.

TABLE A

Ex	Oleics (wt%)	Laurics/Stearics	Neutralization (%)	Handling properties	Solubility $t_{\frac{1}{2}}$
1	15	60/40	45	good	8.25
2	15	70/30	33	good	12.0
3	5	70/30	45	good	5.75

EXAMPLES 4-6

Examples 1-3 were repeated, but instead the molten acid/soap mixtures were spray-cooled in a spray tower to form prills. The spray-cooling conditions are shown in Table B. The powder properties of the prills obtained are given in Table C.

TABLE B

Spray-cooling Conditions	
Air flow rate	7,000 kg/h
Tower pressure	-2/-10 mm H2O
Nozzle pressure	1/8 bar
Throughput	60-150 kg/h
Liquid temperature tank	86-120 °C
Temperature air in (counter current)	22-24 °C
Temperature air out	22-25 °C
Prill temperature at tower base	27-33 °C
Nozzle height	12 m

TABLE C

Powder Properties			
Example	4	5	6
Bulk density	565	533	570
D.F.Rate (ml/s)	152	145	152
Compressibility (%v/v)	7	15	10
Particle size:	607	853	558
d(m) n	2.89	6.74	3.03
12 mesh/1400 m	0.1	4.4	0.2
16 mesh/1000 m	1.4	15.4	1.1
22 mesh/710 m	13.3	50.5	15.2
30 mesh/500 m	34.4	26.6	30.9
44 mesh/355 m	22.7	1.9	26.0
60 mesh/250 m	14.1	0.1	17.5
80 mesh/180 m	5.7	0.1	7.1
120 mesh/125 m	1.4	0.1	1.1
>120 mesh	0.1	0.0	0.1
Solubility			
$t_{\frac{1}{2}}$ (min)	2	2.75	2.75
t1 (min)	10	7	12

From comparison of Examples 1-3 with 4-6 it follows that by spray-cooling the partially neutralized fatty acid mixtures, prills are obtained having particularly advantageous solubility and powder properties.

EXAMPLE 7

A mixture of fatty acids was prepared, having thefollowing composition :

20 wt.% oleics

45 wt.% C12-C14 fatty acids

35 wt.% stearics

The mixture was heated to 65 °C and, under continuous heating, solid sodium carbonate was added until a degree of saponification of 33% was reached. The molten soap/fatty acid mixture was subsequently spray-cooled at a temperature of 110 °C, using the conditions given in Table B.

High density prills were obtained, having highly satisfactory powder handling properties, as shown in Table D.

TABLE D

Powder properties of spray-cooled soap/fatty acid mixtures.		
Example	7	8
C12-C14 fatty acids	45	40
C16-C18 fatty acids	35	30
Oleics	20	30
Neutralization agent	Soda ash (7 wt.%)	Sodium disilicate (17.2 wt.%)
Bulk density (T = 24 h) kg/m3	531	573
Dynamic flow rate		
(T = 1h) ml/s	126	100
(T = 24h)	136	139
Compressibility (T = 24h) % v/v	20	20
Particle size:		
Oversize >1900 m(%)	5	10
d (m)	887	904
Fines <180 m	0	0.1

EXAMPLE 8

The procedure of Example 7 was repeated, using a fatty acid mixture of the following composition :
30 wt.% oleics
40 wt.% C12-C14 fatty acids
30 wt.% stearics
The molten fatty acid mixture was partially neutralized, using solid sodium disilicate, and subsequently spray-cooled. The properties of the prills obtained are given in Table D above and indicate highly satisfactory handling properties.

EXAMPLE 9

The acid soap prills obtained according to Example 7 were used to formulate a complete laundry detergent composition by dry-mixing various other ingredients to the prills, such as a nonionic detergent on a Burkeite carrier, a bleach system and an enzyme.

The composition of the complete detergent powder is given in Table E. Also shown are two commercially available laundry detergent compositions, composition B being a low-P and composition A a zero P composition, both based on zeolites.

The wash performance of these three compositions was established in a Zanussi ZF 822W top loading drum washing machine, using the normal 40 °C cotton cycleprogramme "C". 2.5 kg clean mixed wash load of clean cotton pieces and standard soiled test cloths was processed at a liquor/cloth ratio of approximately 6. The water temperature was 20 °C at a pressure of 2.0 kg/cm2. The water hardness was 9 or 25 °GH. The wash powder was added in a dosage of 7.5 g/l. The differences in reflectance of the test clothes before and after the wash (R*460) were recorded.

The results of the tests at the two different degrees of water hardness using four different test cloths, including the standard EMPA-101 and WFK-10C cloths, are shown in Table F. From these results it is clear that, even at a high water hardness, a very satisfactory washing performance was observed, despite the fact that no phosphate or zeolite builder was present.

TABLE E

Example 9	wt.%
Soap/fatty acid prills according to Example 7	45.0
Nonionic/Burkeite adduct (ethoxylated alcohol (5%); soda (5%); sulphate (10%))	20.0
TAED	3.0
Sodium perborate monohydrate	6.0
SCMC	2.0
EDTA	0.2
Enzyme	0.5
Soda	18.3
Sodium alkaline silicate (ratio 2)	5.0
	100.00

Composition B (low-phosphate)		wt.%
LAS		8.5
Nonionic		3.2
Soap		1.0
Sodium perborate monohydrate		5.5
Enzyme		0.5
TAED		5.1
Sodium alkaline silicate (ratio 2)		2.0
STP		18.0
Zeolite		13.0
SCMC		0.5
Soda		5.0
EDTA		0.15
Sodium sulphate		25.0
Water/minors	up to	100.00

Composition A (zero-phosphate)		wt.%
LAS		7.6
Nonionic		4.8
Soap		0.6
Sodium perborate tetrahydrate		17.9
Enzyme		0.4
Alkaline silicate		4.3
Zeolite		21.1
SCMC		0.8
Soda		5.8
Dequest		0.9
Sodium sulphate		19.5
NTA		3.5
Polymer		2.4
Water/minors	up to	100.0

Table F

	9 °GH			25 °GH		
	9	A	B	9	A	B
Test cloth 1 (proteinaceous soil)	27	28	29	24	27	26
Test cloth 2 (greasy/particulate soil)	33	26	37	32	25	36
Test cloth 3 (EMPA-101)	17	14	18	17	12	17
Test cloth 4 (WFK-10C)	17	19	18	18	20	17

Claims

1. Particulate laundry detergent composition comprising as a first particulate material a fatty acid mixture in which up to 35 mole% may be unsaturated fatty acids, which mixture has been neutralised to an extent of 25-60 mole %, and as a second particulate material a base in an amount sufficient to render the pH of the composition at a 0.5 wt% concentration in water higher than 8.

2. Particulate laundry detergent composition according to claim 1, which contains 30-80% of the partially neutralised fatty acid mixture.

3. Particulate laundry detergent composition according to claim 1 or claim 2, in which the mixture of fatty acids essentially consists of 5 - 20 mole% C16-C18 unsaturated fatty acids, and 95 - 80 mole% of a mixture of C8-C14 saturated fatty acids and C16-C18 saturated fatty acids in a ratio of 3:1-1:2.

4. Particulate laundry detergent composition according to any preceding claims, in which the base is sodium carbonate or sodium alkaline silicate.

5. Particulate laundry detergent composition according to any preceding claim, additionally comprising a non-soap detergent active material.

6. Particulate laundry detergent composition according to claim 5, comprising up to 10 wt% anionic and/or nonionic detergent material within the first granular material.

7. Particulate laundry detergent composition according to claim 5, comprising a liquid nonionic material on a porous inorganic carrier.

8. Particulate laundry detergent composition according to any preceding claim, additionally comprising a peroxy bleach system and/or sodium alkaline silicate and/or an antifoam compound and/or an enzyme.

9. Particulate acid soap material suitable as a base powder for manufacturing laundry detergent powders, consisting essentially of a fatty acid mixture in which up to 35 mole% may be unsaturated fatty acids, which mixture has been neutralised to an extent of 25-60 mole%.

10. Particulate acid soap material according to claim 9, in which the mixture of fatty acids essentially consists of 5 - 20 mole% C16-C18 unsaturated fatty acids, and 95 - 80 mole% of a mixture of C8-C14 saturated fatty acids and C16-C18 saturated fatty acids in a ratio of 3:1-1:2.

11. Particulate acid soap composition according to claim 9 or claim 10, in the form of prills or noodles.

12. Particulate acid soap material according to any one of claims 9-11 in which the degree of neutralisation is 30-40 mole%.

13. Process for manufacturing the particulate acid soap material according to claim 9, characterised by the steps of melting a mixture of fatty acids optionally containing one or more soaps, partially neutralising the mixture if necessary by adding a base, and converting it to a particulate solid form.

14. Process according to claim 13, characterised in that the particulate acid soap material is prepared by spray-cooling the partially neutralised molten mixture of fatty acids to form prills.

15. Process according to claim 13 or claim 14, characterised in that the mixture of fatty acids is partially neutralised by addition of sodium carbonate and/or sodium alkaline silicate.

Patentansprüche

1. Waschmittelzusammensetzung in Teilchenform, die als ein erstes fein verteiltes Material eine Fettsäuremischung, in der bis zu 35 Mol% ungesättigten Fettsäuren vorliegen können, wobei die Mischung bis zu einem Grad von 25-60 Mol% neutralisiert worden ist, und als ein zweites fein verteiltes Material eine Base in einer Menge enthält, die ausreicht, den pH der Zusammensetzung bei einer Konzentration von 0.5 Gew.-% in Wasser von höher als 8 zu liefern.

2. Waschmittelzusammensetzung in Pulverform nach Anspruch 1, die 30-80% der teilweise neutralisierten Fettmischung enthält.

3. Waschmittelzusammensetzung in Teilchenform nach Anspruch 1 oder Anspruch 2, wobei die Mischung der Fettsäuren im wesentlichen aus 5-20 Mol% C16-C18 ungesättigten Fettsäuren, und 95-80 Mol% einer Mischung von C8-C14 gesättigter Fettsäuren und C16-C18 gesättigter Fettsäuren in einem Verhältnis von 3:1-1:2 besteht.

4. Waschmittelzusammensetzung in Teilchenform nach einem der vorhergehenden Ansprüche, wobei die Base Natriumkarbonat oder alkalisches Natriumsilikat ist.

5. Waschmittelzusammensetzung in Teilchenform nach einem vorhergehenden Anspruch, die zusätzlich ein seifenfreies waschaktives Material umfaßt.

6. Waschmittelzusammensetzung in Pulverform nach Anspruch 5, die bis zu 10 Gew.-% anionisches und/oder nichtionisches Detergenzmaterial im ersten granulären Material enthält.

7. Waschmittelzusammensetzung in Pulverform nach Anspruch 5, die zusätzlich ein flüssiges nichtionisches Material auf einem porösen anorganischen Träger umfaßt.

8. Waschmittelzusammensetzung in Teilchenform nach einem vorhergehenden Anspruch, die zusätzlich ein Peroxibleichmittel-System und/oder alkalisches Natriumsilikat und/oder eine Anti-Schaum-Verbindung und/oder ein Enzym umfaßt.

9. Fettsäureseifenmaterial in Teilchenform, das als ein Ausgangspulver zur Herstellung von Waschmitttelpulvern geeignet ist, das im wesentlichen aus einer Fettsäuremischung, in der bis zu 35 Mol% ungesättigte Fettsäuren vorliegen können, wobei die Mischung bis zu einem Grad von 25-60 Mol% neutralisiert worden ist, besteht.

10. Fettsäureseifenmaterial in Teilchenform nach Anspruch 9, wobei die Mischung von Fettsäuren im wesentlichen aus 5-20 Mol% C16-C18 ungesättigten Fettsäuren und 95-80 Mol% einer Mischung von C8-C14 gesättigten Fettsäuren und C16-C18 gesättigten Fettsäuren in einem Verhältnis von 3:1-1:2 besteht.

11. Fettsäurenseifenzusammensetzung in Teilchenform nach Anspruch 9 oder 10 in der Form von Prillgranalien oder Strängen.

12. Fettsäurenseifenmaterial in Teilchenform nach einem der Ansprüche 9 bis 11, bei dem der Grad der Neutralisation 30-40 Mol% beträgt.

13. Verfahren zur Herstellung des Fettsäureseifenmaterials in Teilchenform nach Anspruch 9, gekennzeichnet durch die Schritte des Schmelzen einer Mischung von Fettsäuren, die gegebenenfalls ein oder mehrere Seifen enthält, teilweises Neutralisieren der Mischung, falls notwendig durch Zufügung einer Base, und Umwandlung dieser in eine feste Teilchenform.

14. Verfahren nach Anspruch 13, dadurch gekennzeichnet, daß das Fettsäurenseifenmaterial in Teilchenform durch Sprühkühlen der teilweise neutralisierten geschmolzenen Mischung von Fettsäuren zur Bildung von Prillgranalien hergestellt wird.

15. Verfahren nach Anspruch 13 oder 14, dadurch gekennzeichnet, daß die Mischung von Fettsäuren durch Zugabe von Natriumcarbonat und/oder alkalischem Natriumsilikat teilweise neutralisiert wird.

Revendications

1. Composition détergente particulaire de blanchissage comprenant :
à titre d'une première matière particulaire, un mélange d'acides gras dans lequel jusqu'à 35 moles% peuvent être des acides gras insaturés, ce mélange ayant été neutralisé à raison de 25 à 60 moles% et, à titre de seconde matière particulaire, une base en une quantité suffisante pour porter le pH de la composition, en une concentration dans l'eau de 0,5% en poids, à une valeur supérieure à 8.

2. Composition détergente particulaire de blanchissage selon la revendication 1, qui contient de 30 à 80% du mélange d'acides gras partiellement neutralisé.

3. Composition détergente particulaire de blanchissage selon la revendication 1 ou 2, dans laquelle le mélange d'acides gras comprend essentiellement 5 à 20 moles% d'acides gras insaturés en C_{16-18} et de 95 à 80 moles % d'un mélange d'acides gras saturés en C_{8-14} et d'acides gras saturés en C_{16-18} en un rapport de 3:1 à 1:2.

4. Composition détergente particulaire de blanchissage selon l'une quelconque des revendications précédentes, dans laquelle la base est le carbonate de sodium ou le silicate alcalin de sodium.

5. Composition détergente particulaire de blanchissage selon l'une quelconque des revendications précédentes, qui comprend en outre une matière détergente active non savonneuse.

6. Composition détergente particulaire de blanchissage selon la revendication 5, comprenant jusqu'à 10% en poids de détergent anionique et/ou non ionique au sein de la première matière granulaire.

7. Composition détergente particulaire de blanchissage selon la revendication 5, comprenant une matière non ionique liquide sur un support minéral poreux.

8. Composition détergente particulaire de blanchissage selon l'une quelconque des revendications précédentes, comprenant en outre un système de blanchiment peroxydé et/ou un silicate alcalin de sodium et/ou un composé anti-moussage et/ou une enzyme.

9. Matière savonneuse particulaire acide pouvant servir de poudre de base pour la fabrication de poudres détergentes de blanchissage, qui consiste essentiellement en un mélange d'acides gras dont jusqu'à 35 moles% peuvent être des acides gras insaturés, le mélange ayant été neutralisé à un degré de 25 à 60 moles%.

10. Matière savonneuse particulaire acide selon la revendication 9, dans laquelle le mélange d'acides gras comprend essentiellement 5 à 20 moles% d'acides gras insaturés en C_{16-18} et 95 à 80 moles% d'un mélange d'acides gras saturés en C_{8-14} et d'acides gras saturés en C_{16-18} en un rapport de 3:1 à 1:2.

11. Composition savonneuse particulaire acide selon la revendication 9 ou 10, sous forme de granules ou de nouilles.

12. Matière savonneuse particulaire acide selon l'une quelconque des revendications 9 à 11, dont le degré de neutralisation est de 30 à 40 moles%.

13. Procédé de fabrication d'une matière savonneuse particulaire acide selon la revendication 9, caractérisé en ce qu'on fait fondre un mélange d'acides gras contenant facultativement un ou plusieurs savon(s), on neutralise partiellement le mélange en ajoutant éventuellement une base et on le convertit en une forme solide particulaire.

14. Procédé selon la revendication 13, caractérisé en ce qu on prépare la matière savonneuse particulaire acide en refroidissant par pulvérisation le mélange fondu partiellement neutralisé d'acides gras pour former des granules.

15. Procédé selon la revendication 13 ou 14, caractérisé en ce qu'on neutralise partiellement le mélange d'acides gras par addition de carbonate de sodium et/ou de silicate alcalin de sodium.