Abstract:

A process for cleansing keratin materials comprising, in a physiologically acceptable medium, rod-like amphiphilic silica particles comprising: - a first part having an average length L1 comprising SiOx(2r) and SiOx4r02(OH)y2r units, n being an integer equal to 1 or 2 or 3; - a second part having an average length L2 comprising SiOx3r22R2 group units, R2 denoting a C1 to C20 alkyl group optionally interrupted in its chain by an O or S atom or by an NH group or a carbonyl (CO) group, or combinations thereof. The invention also relates to a composition comprising, in a physiologically acceptable medium, said rod-like amphiphilic silica particles, and a cosmetic ingredient chosen from fragrances, non-monohydrosylated preservatives, fillers, colorants, UV-screening agents, silicone oils, ester oils, vegetable oils, C18-C20 fatty alcohols, liquid paraffins, waxes, surfactants, moisturizers, vitamins, proteins, ceramides, antioxidants and free-radical scavengers.
Process for cleansing keratin materials

The invention relates to a cosmetic composition comprising rod-like amphiphilic silica particles and to a process for treating keratin materials, in particular for cleansing, with such a composition.

Cleansing of the skin is very important, in particular for facial care. It must be as effective as possible since fatty residues, such as excess sebum, the residues of cosmetic products used daily and makeup products accumulate in the skin folds and on the surface of the skin, and they can block the skin pores and thus cause the appearance of spots. A poor cleansing quality is often responsible, among other causal factors, for a muddy complexion.

The surfactants conventionally used for skin cleansing products can be aggressive and can have a tendency to dry out the skin. Likewise, the surfactants of hair cleansing products can make the latter rougher to the touch.

US6436413 describes cleansing compositions containing silica particles Aerosil R972 which are fumed silica treated with dimethylsilane. Meanwhile, these particles have not really acceptable cleansing property as shown in the comparative examples described hereinafter.

The objective of the present invention is to have skin and hair cleansing products which are sparingly aggressive and which confer good cosmetic properties on the keratin materials cleaned, in particular improved cleaning property, properties of softness and of a soft feel (absence of rough sensation or of drying out).

The applicant has demonstrated that particular amphiphilic silica particles make it possible to produce products for cleansing keratin materials which have the abovementioned advantages.

A subject of the invention is therefore a process for treating keratin materials (such as the skin, the hair, the nails, the eyelashes, the eyebrows, the lips), comprising the application, to the keratin materials, of a composition comprising, in a physiologically acceptable medium, rod-like amphiphilic silica particles, as defined hereinafter.

The treatment process is in particular a process for cleansing keratin materials, preferably skin.

A subject of the invention is also a composition comprising, in a physiologically acceptable medium, rod-like amphiphilic silica particles, as defined hereinafter, and a cosmetic ingredient chosen from fragrances, non-monohydroxylated preservatives, fillers, colorants, UV-screening agents, silicone oils, ester oils, vegetable oils, C12-C30 fatty alcohols, liquid paraffins, waxes, surfactants, moisturizers, vitamins, proteins, ceramides, antioxidants and free-radical scavengers.
The composition used according to the invention is sparingly aggressive to the skin and the hair: the surface of the hair is smoother and softer; the skin is not dried out, and is softer to the touch. Furthermore, the constituent lipids of the structure of the skin and of the hair are not modified during the application of the composition to the skin or the hair.

Moreover, the composition used according to the invention is stable, in particular after storage for one month, or even two months at 45°C, in particular when it is in the form of an emulsion, in particular of an oil-in-water emulsion.

The rod-like amphiphilic silica particles used according to the invention comprise:
- a first part (called hydrophilic part) having an average length \( L_1 \) comprising \( \text{SiO}_4^{2-} \) and \( \text{SiO}_4(\text{OH})_2 \) units, \( n \) being an integer equal to 1 or 2 or 3;
- a second part (called hydrophobic part) having an average length \( L_2 \) comprising \( \text{SiO}_3(\text{R}^2) \) group units, \( \text{R}^2 \) denoting a \( \text{C}_6 \) to \( \text{C}_{20} \) alkyl group optionally interrupted in its chain by an O or S atom or by an NH group or a carbonyl (CO) group, or combinations thereof, such as ester -COO-, amide -CONH-, thioester -COS-, carbamate -NCOO-, or urea -NHCONH- groups.

The term "rod-like particles" is intended to mean a particle in the shape of a thin, elongated cylinder.

Advantageously, this particular shape of said particles is characterized in particular:
- by an average length \( L = L_1 + L_2 \) ranging from 0.2 to 15 \( \mu \text{m} \), preferably ranging from 0.3 to 12 \( \mu \text{m} \), preferably ranging from 0.4 to 10 \( \mu \text{m} \), preferably ranging from 0.5 to 10 \( \mu \text{m} \), preferably ranging from 0.6 to 8 \( \mu \text{m} \), preferably ranging from 0.8 to 8 \( \mu \text{m} \), preferably ranging from 1 to 6 \( \mu \text{m} \), preferably ranging from 1 to 5 \( \mu \text{m} \), preferably ranging from 1 to 4.5 \( \mu \text{m} \), preferentially ranging from 1 to 4 \( \mu \text{m} \); 
- by an average largest diameter \( D \) ranging from 0.1 to 0.5 \( \mu \text{m} \), preferably ranging from 0.2 to 0.4 \( \mu \text{m} \); 
- and by a length / average largest diameter \( D \) aspect ratio ranging from 0.4 to 150, preferably ranging from 1 to 60, preferentially ranging from 2 to 30.

The term "diameter of the rod" is intended to mean the diameter of the circle in which the cross-section of the rod lies.

The expression "average largest diameter \( D \) of the rod-like particles" is intended to mean the average of the largest diameter of the rod-like particles.

The amphiphilic nature of the rod-like silica particle is due to the presence of a part (first part) of said particle which is hydrophilic in nature and another complemen-
tary part (second part) of said particle which is hydrophobic in nature.

The first part of the particle (hydrophilic part) preferably has an average length $L_1$ ranging from 0.1 to 10 $\mu\text{m}$, preferably ranging from 0.8 to 4 $\mu\text{m}$, and preferentially ranging from 0.8 to 2.5 $\mu\text{m}$.

The second part of the particle (hydrophobic part) preferably has an average length $L_2$ ranging from 0.1 to 5 $\mu\text{m}$, preferably ranging from 0.2 to 2 $\mu\text{m}$, preferentially ranging from 0.2 to 1.5 $\mu\text{m}$.

According to one embodiment of said particles, the first part (hydrophilic part) of the particles can have an average diameter $D_1$ ranging from 0.1 to 0.5 $\mu\text{m}$, preferably ranging from 0.2 to 0.4 $\mu\text{m}$, preferably ranging from 0.21 to 0.36 $\mu\text{m}$.

The second part (hydrophobic part) of the particles can have an average diameter $D_2$ ranging from 0.1 to 0.3 $\mu\text{m}$, preferably ranging from 0.12 to 0.26 $\mu\text{m}$.

This average diameter $D_2$ is the result of the average of the diameters of the hydrophobic part at the beginning, middle and end positions of said part.

The rod-like amphiphilic silica particles can be obtained by consecutive sol-gel polymerization (hydrolysis and condensation of the silanes used) of tetra(Ci-C$_4$)alkoxysilane of formula (I) Si(OR$_i$)$_4$

then of an alkyltrialkoxy silane of formula (II) R$_2$Si(OR$_s$)$_3$

in which formulae

$R_1$ denotes a Ci-C$_4$ alkyl group,

$R_2$ denotes a C$_6$ to C$_{20}$ alkyl group optionally interrupted in its chain by an O or S atom or by an NH group or a carbonyl (CO) group, or combinations thereof, such as ester -COO-, amide -CONH-, thioester -COS-, carbamate -NCOO-, and urea -NHCONH- groups,

$R_3$ denotes a Ci-C$_4$ alkyl group,

in particular in the presence of a C$_3$-C$_8$ monoalcohol (in particular n-pentanol), of water, of ethanol and of polyvinylpyrrolidone.

Preferably, $R_1$ denotes an ethyl group.

Preferably, $R_2$ denotes a C$_6$ to C$_{20}$ alkyl group.

Preferably, $R_2$ denotes a C$_{10}$ to C$_{20}$ alkyl group.

Preferably, $R_2$ denotes a C$_{14}$ to C$_{18}$ alkyl group.

Preferably, $R_3$ denotes a methyl or ethyl group. Advantageously, $R_3$ denotes a methyl group. Advantageously, $R_3$ denotes an ethyl group.

Advantageously, the compound (I) is tetraethoxysilane.
Preferably, the compound (II) is hexadecyltrimethoxysilane or hexadecyltriethoxysilane.
Advantageously, the compound (II) is hexadecyltrimethoxysilane.

Advantageously, the compound (II) is hexadecyltriethoxysilane.

The hydrolysis/condensation of the silane (I) forms the hydrophilic part of the rod-like silica particles. This hydrophilic part consists of SiO$^{3/2}$ units and of SiO$^{3/2}$ units, n being an integer equal to 1 or 2 or 3 (silanol groups at the surface of the particle).

The hydrolysis/condensation of silane (II) forms the hydrophobic part of the rod-like silica particles. This hydrophobic part consists of SiO$^{3/2}$(R$^2$) units, R$^2$ being as defined above.

The hydrolysis and condensation of the silane (I) at the interface of an aqueous emulsion promotes the formation of the hydrophilic part of the rod-like particles. When the silane (II) is then added, the latter, after hydrolysis/condensation, forms the hydrophobic part of the rod-like particle in the extension of the hydrophilic part previously formed.

According to one embodiment of said particles, the hydrophilic part of the rod is rigid and solid, while the hydrophobic part of the rod is flexible and in the form of a hollow tail.

According to one preferred embodiment of the invention, the rod-like amphiphilic silica particles can be obtained by consecutive sol-gel polymerization of tetraethoxysilane and then of hexadecyltrimethoxysilane, in particular in the presence of n-pentanol, of water, of ethanol and of polyvinylpyrrolidone (for example of weight-average molecular weight 40 000 g/mol).

Advantageously, the sol-gel polymerization is carried out at a pH of between 4 and 10. The pH can be adjusted using standard buffers, such as sodium citrate or ammonium hydroxide.

According to one embodiment of the invention, said particles can be prepared by sol-gel polymerization using the following ingredients (contents as weight percentage):

- Compound (I) described above: 0.4% to 1%
- Compound (II) described above: 0.1 % to 5%
- C$_3$-C$_8$ monoalcohol: 70%-85%
- water: 2%-1 0%
- ethanol: 4%-1 2%
- polyvinylpyrrolidone: 5%-1 5%.
Such rod-like amphiphilic silica particles are described in the article "Wet-Chemical synthesis of amphiphilic rodlike silica particles and their molecular mimetic assembly in selective solvents" He J. at al, Angew. Chem 2012, 51, 3628-3633.

As examples of rod-like amphiphilic silica (AS) particles, mention may be made of the following particles described in the abovementioned He article:

| AS-1  | 1.81  | 0.25  | 0.21  | 0.19  | 10 |
| AS-2  | 1.01  | 0.21  | 0.36  | 0.26  | 4  |
| AS-3  | 2.25  | 0.9   | 0.3   | 0.12  | 10 |
| AS-4  | 2.4   | 1.27  | 0.34  | 0.14  | 10 |

1. Hydrophilic part obtained by hydrolysis/condensation of tetraethoxysilane
2. Hydrophobic part obtained by hydrolysis/condensation of hexadecyltrimethoxysilane

Said amphiphilic silica particles may be present in the composition according to the invention in a content ranging from 0.1% to 10% by weight, relative to the total weight of the composition, preferably ranging from 0.05% to 5% by weight, preferentially ranging from 0.1% to 2% by weight.

The term "physiologically acceptable medium" is intended to mean a medium that is compatible with human keratin materials and/or fibres, for instance, in a non-limiting manner, the skin, the mucous membranes, the nails, the scalp and/or the hair.

The composition used according to the invention may comprise a cosmetic additive chosen from fragrances, preservatives, in particular non-monohydroxylated preservatives, fillers, colorants, UV-screening agents, oils such as silicone oils, ester oils or vegetable oils, C6-C30 fatty alcohols, liquid paraffins, waxes, surfactants, moisturizers, vitamins, proteins, ceramides, antioxidants and free-radical scavengers.

Preferably, the composition according to the invention is an emulsion, in particular an oil-in-water emulsion.
The composition according to the invention may comprise at least one oil.

As oils that may be used in the composition of the invention, examples that may be mentioned include:

- oils of vegetable origin, such as triglycerides consisting of fatty acid esters of glycerol, the fatty acids of which may have chain lengths varying from C₄ to C₂₄, these chains possibly being linear or branched, and saturated or unsaturated; these oils can be chosen from wheatgerm oil, sunflower oil, grapeseed oil, sesame oil, corn oil, apricot oil, castor oil, shea oil, avocado oil, olive oil, soybean oil, sweet almond oil, rapeseed oil, cottonseed oil, hazelnut oil, macadamia oil, jojoba oil, alfalfa oil, poppy oil, pumpkin oil, marrow oil, blackcurrant oil, evening primrose oil, millet oil, barley oil, quinoa oil, rye oil, safflower oil, candlenut oil, passion flower oil and musk rose oil;

- synthetic esters, in particular of fatty acids, for instance oils of formulae R₁COOR₂ and R₁OR₂ in which R₁ represents a fatty acid residue comprising from 8 to 29 carbon atoms and R₂ represents a branched or unbranched hydrocarbon-based chain containing from 3 to 30 carbon atoms, for instance purcellin oil (cetostearyl octanoate), isopropyl myristate, isopropyl palmitate, C₁₂ to C₁₄ alkyl benzoates, hexyl laurate, diisopropyl adipate, isononyl isononanoate, 2-ethylhexyl palmitate, isostearyl isostearate, 2-hexyldecyl laurate, 2-octyldecyl palmitate, 2-octyldecyldodecyl myristate, heptanoates, octanoates, decanoates or ricinoleates of alcohols or of polyalcohols, for instance propylene glycol dioctanoate; hydroxy esters, such as isostearyl lactate, diisostearyl malate or 2-octyldecyldodecyl lactate; polyol esters, such as propylene glycol dioctanoate, neopentyl glycol diheptanoate and diethylene glycol diisononanoate; and pentaerythritol esters, such as pentaerythrityl tetraisostearate;

- fatty alcohols that are liquid at room temperature, with a branched and/or unsaturated carbon-based chain containing from 12 to 26 carbon atoms, for instance octyldecanol, isostearyl alcohol, oleyl alcohol, 2-hexyldecanol, 2-butyloctanol and 2-undecylpentadecanol;

- higher fatty acids such as oleic acid, linoleic acid or linolenic acid, and mixtures thereof;

- synthetic ethers containing from 10 to 40 carbon atoms;

- linear or branched hydrocarbons of mineral or synthetic origin, such as liquid paraffins, petroleum jelly, polydecenes, and hydrogenated polyisobutene such as parleam oil;
- silicone oils, such as polydimethylsiloxanes (PDMSs) with a linear or cyclic silicone chain, in particular cycodimethicones such as cyclohexasiloxane; polydimethylsiloxanes comprising alkyl or alkoxy groups, which are pendent or at the end of a silicone chain; these groups containing from 2 to 24 carbon atoms; phenylsilicones, for instance phenyl trimethicones, phenyl dimethicones, phenyltrimethylsiloxidoxyphenylsiloxanes, diphenyl dimethicones, diphenylmethylidiphenylsiloxanes or 2-phenylethyl trimethylsiloxy silicates, and polymethylphenylsiloxanes;

- fluoro oils;

- mixtures thereof.

The oil may be present in the content ranging from 0.01 % to 40% by weight, relative to the total weight of the composition, preferably ranging from 0.1 % to 30% by weight, and preferentially ranging from 1% to 20% by weight.

The composition according to the invention may comprise water in a content ranging from 20% to 98% by weight, relative to the total weight of the composition, preferably ranging from 30% to 95% by weight, and preferentially ranging from 40% to 90% by weight.

The invention is now illustrated with the aid of the non-limiting examples that follow.

**Example 1**: Face-cleansing oil-in-water emulsion

The following oil-in-water emulsion is prepared (contents as weight percentage): 2.1 % of rod-like amphiphilic silica particles (AS-1)

97% of water

2.1% of polydimethylsiloxane 350 mm²/s (Wacker® AK 350 Silicone Fluid from Wacker Chemie).

The amphiphilic silica particles are dispersed in water in a beaker placed in an ice bath, with stirring using an UltraTurrax mixer at 10 000 revolutions/minute for 2 minutes, and then the polydimethylsiloxane is added dropwise and with stirring so as to obtain the oil-in-water emulsion.

1 g of the emulsion obtained is applied to the face having a shiny appearance, the emulsion being gently massaged on the entire surface. Next, the face is rinsed with water and then dried with a towel. After the cleansing, the face has a clean and non-shiny feel.

Similar emulsions are prepared with the AS-1 particles being replaced, respectively, with the AS-2, AS-3 and AS-4 particles.

**Comparative example 2**: 


The following compositions were prepared:
Composition 1 and 3 (invention) contain silica particle SA-1.
Composition 2 and 4 (non-invention) contain silica particle Aerosil R972 (Degussa) as described in US6436413.

<table>
<thead>
<tr>
<th></th>
<th>Composition 1 (invention)</th>
<th>Composition 2 (non-invention)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>8,2g</td>
<td>8,2g</td>
</tr>
<tr>
<td>Polydimethylsiloxane WACKER® AK 350 SILICONE FLUID</td>
<td>0,10g</td>
<td>0,10g</td>
</tr>
<tr>
<td>Silica particles : SA-1</td>
<td>0,18g</td>
<td></td>
</tr>
<tr>
<td>Silica particles : Aerosil R972 from Degussa (described in US6436413)</td>
<td></td>
<td>0,18g</td>
</tr>
</tbody>
</table>

The silica particles were placed in a 20mL vial then dispersed in the water using an Ultra-Thurrax machine turning at 10000 rpm. The polydimethylsiloxane was added dropwise with stirring. An emulsion O/W was formed.

<table>
<thead>
<tr>
<th>Phase A</th>
<th>Composition 3 (invention)</th>
<th>Composition 4 (non-invention)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica particles : SA-1</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Silica particles : Aerosil R972 from Degussa</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>C20-C40 alkyl stearate (KESTER WAX K 82 H from Koster Keunen)</td>
<td>1g</td>
<td>1g</td>
</tr>
<tr>
<td>C32-C36 isoalkyl stearate (BRANCHED KESTER WAX BK-40 from Koster Keunen)</td>
<td>2g</td>
<td>2g</td>
</tr>
<tr>
<td>Caprylic/capric triglyceride (TRILGLYCERIDES C8C10 70/30 - DUB MCT 7030 from Stearinerie Dubois)</td>
<td>5g</td>
<td>5g</td>
</tr>
<tr>
<td>Caprylic glycol</td>
<td>10g</td>
<td>10g</td>
</tr>
<tr>
<td>C12/C15 alcohol benzoate (TEGOSOFT TN from Goldschmidt)</td>
<td>10g</td>
<td>10g</td>
</tr>
<tr>
<td>Dimethicone (&quot;1 084 - 350cst&quot;) WACKER® AK 350 SILICONE FLUID</td>
<td>2g</td>
<td>2g</td>
</tr>
</tbody>
</table>

| Phase B                  |                           |                               |
| Glycerol                 | 10g                       | 10g                           |
| Carbomer (Carbopol 981)  | 0,1g                      | 0,1g                          |
| Sodium carboxymethylcellulose (Natrosol plus) | 0,05g                 | 0,05g                         |
Composition 4 represents the composition described in US6436413 without the UV filters and preservatives.

The ingredients in Phase A were mixed in a beaker and heated at 70°C. The ingredients in Phase B were mixed in a beaker, stirred (Ultra-Thurrax machine turning at 10000rpm) & heated at 60°C. Whilst stirring Phase A was added to Phase B. Stirring was continued for 5 minutes then the mix was allowed to cool to room temperature giving a O/W emulsion.

Evaluation of the skin-cleaning performance

On artificial skins (Bioskin® Black sold by Marcepos, France) was spread 20 microlitres/cm² of a mix of 2 compositions: a synthetic sebum and a synthetic sweat. The mix of these two fluids was made using a ratio of 1 to 5 (sweat to sebum).

The composition of the artificial sebum is the following (% mass):

<table>
<thead>
<tr>
<th>Component</th>
<th>% Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oleic acid</td>
<td>60</td>
</tr>
<tr>
<td>Oleyl oleate</td>
<td>20</td>
</tr>
<tr>
<td>Cholestoryl oleate</td>
<td>1</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>3</td>
</tr>
<tr>
<td>Squalene</td>
<td>16</td>
</tr>
</tbody>
</table>

The composition of the artificial sweat is the following (% mass):

<table>
<thead>
<tr>
<th>Component</th>
<th>% Mass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultra pure water</td>
<td>Qsp 100</td>
</tr>
<tr>
<td>NaCl</td>
<td>0.5</td>
</tr>
<tr>
<td>Lactic acid</td>
<td>0.1</td>
</tr>
<tr>
<td>Urea</td>
<td>0.1</td>
</tr>
<tr>
<td>Albumin</td>
<td>0.1</td>
</tr>
<tr>
<td>Ammonium hydroxide</td>
<td>Qsp pH 6.5</td>
</tr>
</tbody>
</table>

The film on the Bioskin was left for 5 minutes at room temperature so as to allow it diffuse into the bioskin. 2ml of the compositions 1 to 4 were applied to a cotton make-up remover disk (55mm diameter disk) then used immediately to clean the surface by passing the disk twice over the Bioskin area where the sweat and sebum was applied. A slight pressure was applied to the disk to aid the cleaning process. The film was allowed to dry for 5 minutes. The evaluation was done visually but assessing the shininess (oily effect) or the cleanliness (mat effect) of the films.

Three evaluators were used for each assessment. A score of 1 to 5 was given. A score of 5 corresponded to a clean or mat surface. A score of 1 corresponded to a shiny or dirty surface. The surface treated with the...
sweat and sebum and not cleaned had a score of 1 and was the reference dirty surface. The untreated surface (bare surface) had a score of 5 and was the reference clean surface.

Results

The following results were obtained:

<table>
<thead>
<tr>
<th>N° composition</th>
<th>AVERAGE SCORE (5 = clean et 1 = dirty)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4,67</td>
</tr>
<tr>
<td>2</td>
<td>2,67</td>
</tr>
<tr>
<td>3</td>
<td>4,33</td>
</tr>
<tr>
<td>4</td>
<td>1,33</td>
</tr>
</tbody>
</table>

Conclusions

For the surfaces treated with the compositions containing the silica particles of the invention i.e; examples 1 & 3, an important cleaning effect is observed compared to the compositions containing silica particles Aerosil R972 cited in the prior art.
CLAIMS

1. Process for treating keratin materials, comprising the application, to the keratin materials, of a composition comprising, in a physiologically acceptable medium, rod-like amphiphilic silica particles comprising:
   - a first part (called hydrophilic part) having an average length L1 comprising SiO₄⁻² and SiO₃(₄₋ₙ)₂(OH)ₙ units, n being an integer equal to 1 or 2 or 3;
   - a second part (called hydrophobic part) having an average length L2 comprising SiO₃(₂₋ₙ) group units, R² denoting a C₆ to C₂₀ alkyl group optionally interrupted in its chain by an O or S atom or by an NH group or a carbonyl (CO) group, or combinations thereof, such as ester -COO-, amide -CONH-, thioester -COS-, carbamate -NHCOCO-, and urea -NHCONH- groups.

2. Process according to Claim 1, characterized in that the rod-like amphiphilic silica particles can be obtained by consecutive sol-gel polymerization of tetra(C₁₋₄)alkylsiloxanes of formula (I) Si(OR)₄

   then of an alkyl trialkoxysilane of formula (II) R₂Si(ORS)₃

   in which formulae

   R¹ denotes a C₁₋₄ alkyl group,

   R² denotes a C₆ to C₂₀ alkyl group optionally interrupted in its chain by an O or S atom or by an NH group or a carbonyl (CO) group, or combinations thereof, such as ester -COO-, amide -CONH-, thioester -COS-, carbamate -NHCOCO-, and urea -NHCONH- groups,

   R₃ denotes a C₁₋₄ alkyl group,

   in the presence of a C₃₋₈ monoalcohol (in particular n-pentanol), of water, of ethanol and of polyvinylpyrrolidone.

3. Process according to either one of the preceding claims, characterized in that R² denotes a C₁₄ to C₁₆ alkyl group.

4. Process according to Claim 2 or 3, characterized in that the compound (I) is tetraethoxysilane.

5. Process according to one of Claims 2 to 4, characterized in that the compound (II) is hexadecyltrimethoxysilane or hexadecytriethoxysilane.

6. Process according to one of Claims 2 to 5, characterized in that the rod-like amphiphilic silica particles can be obtained by consecutive sol-gel polymerization of tetraethoxysilane and then of hexadecyltrimethoxysilane, in the presence of n-pentanol, of water, of ethanol and of polyvinylpyrrolidone.

7. Process according to any one of the preceding claims, characterized in that said
particles have the following characteristics:

a) an average length $L = L_1 + L_2$ ranging from 0.2 to 15 µm, preferably ranging from 0.3 to 12 µm, preferably ranging from 0.4 to 10 µm, preferably ranging from 0.5 to 10 µm, preferably ranging from 0.6 to 8 µm, preferably ranging from 0.8 to 8 µm, preferably ranging from 1 to 6 µm, preferably ranging from 1 to 5.5 µm, preferably ranging from 1 to 5 µm, preferably ranging from 1 to 4.5 µm, preferentially ranging from 1 to 4 µm;

b) an average largest diameter $D$ ranging from 0.1 to 0.5 µm, preferably ranging from 0.2 to 0.4 µm;

c) a length / average largest diameter $D$ aspect ratio ranging from 0.4 to 150, preferably ranging from 1 to 60, preferentially ranging from 2 to 30.

8. Process according to any one of the preceding claims, characterized in that said particles have the following characteristics:

- the average length $L_1$ of the first part of said particles ranges from 0.1 to 10 µm, preferably from 0.8 to 4 µm, and preferentially from 0.8 to 2.5 µm;
- the average length $L_2$ of the second part of said particles ranges from 0.1 to 5 µm, preferably from 0.2 to 2 µm, preferentially from 0.2 to 1.5 µm.

9. Process according to any one of the preceding claims, characterized in that said particles have the following characteristics:

- the first part of said particles has an average diameter $D_1$ ranging from 0.1 to 0.5 µm, preferably ranging from 0.2 to 0.4 µm, preferably ranging from 0.21 to 0.36 µm;
- the second part of said particles has an average diameter $D_2$ ranging from 0.1 to 0.3 µm, preferably ranging from 0.12 to 0.26 µm.

10. Process according to any one of the preceding claims, characterized in that said amphiphilic silica particles are present in the composition in a content ranging from 0.1% to 10% by weight, relative to the total weight of the composition, preferably ranging from 0.05% to 5% by weight, preferably ranging from 0.1% to 2% by weight.

11. Process according to any one of the preceding claims, characterized in that the composition comprises oil.

12. Process according to any one of the preceding claims, characterized in that the composition is an oil-in-water emulsion.

13. Process according to any one of the preceding claims, characterized in that it is a process for cleansing keratin materials.
14. Composition comprising, in a physiologically acceptable medium, rod-like amphiphilic silica particles, as defined according to one of Claims 1 to 9, and a cosmetic ingredient chosen from fragrances, non-monohydroxylated preservatives, fillers, colorants, UV-screening agents, silicone oils, ester oils, vegetable oils, C6-C30 fatty alcohols, liquid paraffins, waxes, surfactants, moisturizers, vitamins, proteins, ceramides, antioxidants and free-radical scavengers.

15. Composition according to the preceding claim, characterized in that said amphiphilic silica particles are present in a content ranging from 0.1% to 10% by weight, relative to the total weight of the composition, preferably ranging from 0.05% to 5% by weight, preferentially ranging from 0.1% to 2% by weight.

16. Composition according to either one of Claims 14 and 15, characterized in that the composition comprises oil.

17. Composition according to the preceding claim, characterized in that the oil is present in a content ranging from 0.01% to 40% by weight, relative to the total weight of the composition, preferably ranging from 0.1% to 30% by weight, and preferentially ranging from 1% to 20% by weight.

18. Composition according to any one of Claims 14 to 17, characterized in that it comprises water in a content ranging from 20% to 98% by weight, relative to the total weight of the composition, preferably ranging from 30% to 95% by weight, and preferentially ranging from 40% to 90% by weight.

19. Composition according to any one of Claims 14 to 18, characterized in that the composition is an oil-in-water emulsion.