Sodium Bicarbonate: Natural benefits for cosmetic applications
A whitening smooth abrasive

COSMETIC APPLICATIONS: TOOTHPASTE

Nowadays, toothpastes are expected to eliminate microbes, treat bad breath and prevent disease, but also strengthen and improve the appearance of teeth and gums. In spite of a longer life expectancy of teeth (thanks to the inclusion of fluoride in today’s formulas), a new oral care problem has appeared: dental erosion, leading to tooth sensitivity. Some toothpastes are too abrasive and strip away tooth enamel, which never grows back. Our smooth abrasive sodium bicarbonate preserves tooth enamel, in turn preventing sensitivity to heat or cold.

RDA (relative dentine abrasivity) values of some compounds commonly found in toothpaste:

<table>
<thead>
<tr>
<th>RDA VALUE</th>
<th>DENOMINATION</th>
<th>EXEMPLES &amp; REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 70</td>
<td>LOW ABRASIVE</td>
<td>Sodium bicarbonate : 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Silica : 50</td>
</tr>
<tr>
<td>70 - 100</td>
<td>MEDIUM ABRASIVE</td>
<td>Standard toothpaste : 70-90</td>
</tr>
<tr>
<td>100 - 150</td>
<td>HIGHLY ABRASIVE</td>
<td>Calcium carbonate : 110 (max)</td>
</tr>
<tr>
<td>150 - 250</td>
<td>REGARDED AS HARMFUL LIMIT</td>
<td>FDA Recommended Limit : 200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ADA Recommended Limit : 250</td>
</tr>
</tbody>
</table>

Good to know

When mixed with saliva, sodium bicarbonate acts as an alkaline pH buffer. It neutralizes plaque acids to eliminate microbes. This is important, because plaque acids contain millions of bacteria that damage tooth enamel and gums and can cause disease, if not rapidly treated with smooth, effective brushing.

SPECIFICS

As a smooth abrasive powder, sodium bicarbonate helps clean teeth without damaging the enamel or dentin (see RDA table). Our sodium bicarbonate portfolio offers a wide range of particle sizes for varying levels of abrasiveness and cleaning power in toothpaste.

FORMULATION: FOAMING POWDER

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INCI NAME</th>
<th>COMMERCIAL NAME / SUPPLIER</th>
<th>QUANTITY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>GLYCERIN</td>
<td>GLYCERIN</td>
<td>23</td>
</tr>
<tr>
<td>A</td>
<td>PEG-12</td>
<td>PLURACARE E 600 / BASF</td>
<td>2.7</td>
</tr>
<tr>
<td>A</td>
<td>CARBOXYMETHYLCELLULOSE</td>
<td>AKUCELL AF 1985 / Akzo Nobel</td>
<td>0.9</td>
</tr>
<tr>
<td>B</td>
<td>AQUA</td>
<td>PURIFIED WATER</td>
<td>21.7</td>
</tr>
<tr>
<td>B</td>
<td>SILICA</td>
<td>TIXOSIL 73 / Rhodia</td>
<td>11</td>
</tr>
<tr>
<td>B</td>
<td>SORBITOL</td>
<td>NEOSORB 70/70 NC / IMCD</td>
<td>20</td>
</tr>
<tr>
<td>B</td>
<td>SILICA</td>
<td>TIXOSIL 43 / Rhodia</td>
<td>8</td>
</tr>
<tr>
<td>B</td>
<td>TITANIUM DIOXYDE</td>
<td>HOMBITAN ANATASE FF-PHARMA / Brenntag</td>
<td>0.5</td>
</tr>
<tr>
<td>C</td>
<td>SODIUM BENZOATE</td>
<td>SODIUM BENZOATE / Univar</td>
<td>0.2</td>
</tr>
<tr>
<td>C</td>
<td>POTASSIUM SORBATE</td>
<td>POTASSIUM SORBATE / Brenntag</td>
<td>0.1</td>
</tr>
<tr>
<td>C</td>
<td>SODIUM SACCHARINATE</td>
<td>SODIUM SACCHARINATE</td>
<td>0.2</td>
</tr>
<tr>
<td>C</td>
<td>AROMA</td>
<td>MINT FLAVOR 3124 D / David Michael Europe</td>
<td>1.4</td>
</tr>
<tr>
<td>D</td>
<td>SODIUM LAURYL SULFATE</td>
<td>TEXAPON V 95 G / BASF</td>
<td>1.3</td>
</tr>
<tr>
<td>E</td>
<td>SODIUM BICARBONATE</td>
<td>SODIUM BICARBONATE / Novacarb</td>
<td>9</td>
</tr>
</tbody>
</table>

Process: Add phase A to the main recipient and mix until even. Add water, then slowly add phase B. After adding all the phase B ingredients, mix until even. Add C and mix until even. Micronize phase D and add it. Add phase E. Stir 30 min and empty. The toothpaste will be even and very smooth, with no grains or air pockets.
Deodorant/anti-odor

COSMETIC APPLICATIONS: ROLL-ON DEODORANT

Perspiration is a physical excretion that is normally odorless. But bacteria – which expand because of excretions – generate the strong odors we smell. In fact, perspiration is made up of minerals, but also toxins that provide good conditions for bacteria to grow and produce odors.

In recent decades, antiperspirants dominated the deodorant market. But with rising concerns about the safety and carcinogenicity of some of them, the cosmetics industry decided to enter the natural deodorant market, producing natural odor-fighting compounds.

SPECIFICS

Sodium bicarbonate is an anti-odor alternative to other antiperspirants. It prevents odor from acidifying, by regulating pH levels. Sodium bicarbonate does more than hide odors: it neutralizes them, without impeding perspiration. As a result, when used in a roll-on deodorant, it can be an effective alternative to aluminum salts and other antiperspirants.

FORMULATION: ROLL-ON DEODORANT

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INCI NAME</th>
<th>COMMERCIAL NAME/ SUPPLIER</th>
<th>QUANTITY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>PPG-15 STEARYL ETHER</td>
<td>MASSOCARE E / Masso</td>
<td>4</td>
</tr>
<tr>
<td>A</td>
<td>STEARETH-2</td>
<td>MASSOCARE CSA 02 / Masso</td>
<td>2.2</td>
</tr>
<tr>
<td>A</td>
<td>STEARETH-21</td>
<td>MASSOCARE CSA 21 / Masso</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>AQUA</td>
<td>PURIFIED WATER</td>
<td>60.8</td>
</tr>
<tr>
<td>B</td>
<td>FARNESOL</td>
<td>FARNESOL / Symrise</td>
<td>0.3</td>
</tr>
<tr>
<td>B</td>
<td>PEG-8</td>
<td>LUTROL E 400 / BASF</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>HYDROXYETHYLCELLULOSE</td>
<td>NATROSOL HHR 250 / Ashland</td>
<td>0.5</td>
</tr>
<tr>
<td>C</td>
<td>SODIUM BICARBONATE</td>
<td>SODIUM BICARBONATE / Novacarb</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>DMDM HYDANTOIN</td>
<td>GLYDANT 2000 / Masso/Lonza</td>
<td>0.2</td>
</tr>
<tr>
<td>D</td>
<td>TAPIOCA STARCH</td>
<td>TAPIOCA PURE (28-1810) / Masso</td>
<td>8</td>
</tr>
<tr>
<td>D</td>
<td>FRAGRANCE</td>
<td>FRAGRANCE</td>
<td>1</td>
</tr>
</tbody>
</table>

Process: Place phase A in a melting device and heat to 70°C. Add phase B to a mixer and heat to 70°C. Pour contents of melting device into the mixer. Homogenize 5 minutes, then cool. At 45°C, add phase C. At 30°C, add phase D.
**Mild Scrub**

**COSMETIC APPLICATIONS: EXFOLIATING CREAM**

Some cosmetics help the natural process of dead skin detachment. Depending on the particle size of the raw materials, the action of exfoliants will vary, along with their ability to rejuvenate the skin. The more sensitive the skin, the finer the exfoliant's particle size will need to be. SEQENS Mineral Specialies’ line of sodium bicarbonate products offers a wide range of sensations in the form of exfoliating skin care products.

**Sodium bicarbonate** is highly efficient at gently peeling and exfoliating skin: the cells detach from the skin, and the pores are cleaned. Skin care products are absorbed more easily, and the skin is protected.

Our team has developed a wide range of sodium bicarbonate particle sizes to suit any personal care application. In fact, each particle size corresponds to an intensity of action, and so to a precise exfoliating use for the skin. The correlation table to the left shows the recommended exfoliant applications, based on sodium bicarbonate particle size. Custom-made blends of different particle sizes can also be developed, for an even better fit with your application’s purposes.

Because it is water-soluble, sodium bicarbonate is very easy to rinse.

And, above all, it is a great natural, eco-friendly, alternative exfoliant, because it can effectively replace chemical-based scrubs like PE beads, but also plant-based abrasives like nut shells, fruit pits and bamboo.

### FORMULATION: PEELING

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INCI NAME</th>
<th>COMMERCIAL NAME/ SUPPLIER</th>
<th>QUANTITY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>HELIANTHUS ANNUUS SEED OIL</td>
<td>DEODORIZED OLEIC SUNFLOWER OIL / Sophim</td>
<td>50.045</td>
</tr>
<tr>
<td>A</td>
<td>Cocos nucifera oil (and) hydrogenated coconut oil</td>
<td>PREMIUM ORGANIC COCONUT BUTTER / Naturochim</td>
<td>1.9</td>
</tr>
<tr>
<td>A</td>
<td>Capsicum annuum</td>
<td>P-80,000G-OS / Maprecos</td>
<td>0.005</td>
</tr>
<tr>
<td>A</td>
<td>Hydrogenated castor oil</td>
<td>CUTINA HR / BASF Personal Care and Nutrition GmbH</td>
<td>2</td>
</tr>
<tr>
<td>A</td>
<td>Tocopherol</td>
<td>COVIOX T 90 EU C / BASF Personal Care and Nutrition GmbH</td>
<td>0.4</td>
</tr>
<tr>
<td>B</td>
<td>Polyglyceryl-10 laurate</td>
<td>S FACE L-1001 / Sakamoto Yakuin Kogyo Co, Ltd</td>
<td>9.25</td>
</tr>
<tr>
<td>C</td>
<td>Silica</td>
<td>AEROSIL 200 / Evonik</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>Sodium bicarbonate</td>
<td>Sodium bicarbonate (300 µm) / Novacarb</td>
<td>7.5</td>
</tr>
<tr>
<td>C</td>
<td>Sodium bicarbonate</td>
<td>Sodium bicarbonate (150 µm) / Novacarb</td>
<td>7.5</td>
</tr>
<tr>
<td>D</td>
<td>Fragrance</td>
<td>CARAMEL FUGDE DF SP051149 BELL FLAVORS &amp; FRAGRANCES</td>
<td>0.3</td>
</tr>
</tbody>
</table>

**Process:** Add phase A to a beaker and place in a bain-marie at 80°C. When the mixture is even, add phase B. Cool to 60°C and add phase C. At 50°C, add phase D.
**Effervescent**

**COSMETIC APPLICATIONS: FOAMING SOAP & BATH TABLETS**

**SPECIFICS**

In a solution, the reaction between sodium bicarbonate and a weak acid compound – salicylic acid or citric acid – forms dissolved carbonic acid, providing a smooth, enjoyable effervescence against the skin.

This effervescence, which is unique to sodium bicarbonate, offers an amazing feeling of well-being in bath products like foaming soap, bath tablets, bath salts, bath fizzers and bath bombs.

Sodium bicarbonate is also a water softener. As an anti-scaling agent, it reduces water hardness for efficient, relaxing cleaning: the skin is softer and more relaxed, without that dried-out feeling.

**FORMULATION: FOAMING POWDER**

<table>
<thead>
<tr>
<th>PHASE</th>
<th>INCI NAME</th>
<th>COMMERICAL NAME/ SUPPLIER</th>
<th>QUANTITY (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SODIUM COCOYL ISETHIONATE</td>
<td>ELFAN AT 84 / Masso</td>
<td>22</td>
</tr>
<tr>
<td>A</td>
<td>CITRIC ACID</td>
<td>CITRIC ACID / Merck</td>
<td>17</td>
</tr>
<tr>
<td>A</td>
<td>SODIUM BICARBONATE</td>
<td>SODIUM BICARBONATE / Novacarb</td>
<td>17</td>
</tr>
<tr>
<td>B</td>
<td>ALUMINIUM STARCH OCTENYLsuccinate</td>
<td>DRY FLO PLUS / Masso</td>
<td>43</td>
</tr>
<tr>
<td>B</td>
<td>TITANIUM DIOXYDE</td>
<td>TIO₂ / Evonik</td>
<td>0.35</td>
</tr>
<tr>
<td>B</td>
<td>FRAGRANCE</td>
<td>FRAGANCE</td>
<td>0.3</td>
</tr>
<tr>
<td>B</td>
<td>CL:14700</td>
<td>RED 4 / Sensient</td>
<td>QSP</td>
</tr>
</tbody>
</table>

Process: Crush phase A, then add the crushed powders to a powder mixer, along with the other ingredients (phase B). Mix until even. Careful: The product may lose its evenness if mixed for too long.

**Good to know**

The effervescent properties of bicarbonate make bath tablets dissolve even faster.
Sodium Bicarbonate: A natural mineral ingredient

WHAT IS SODIUM BICARBONATE?

Sodium bicarbonate (INCI name: Sodium bicarbonate), also known as baking soda, is a mineral compound with the formula NaHCO₃. It is registered under CAS number 144-55-8. Although its natural form is a white, crystalline mineral solid called “Nahcolite,” the most common form of sodium bicarbonate is a fine white powder, produced by crystallization. Its many properties make sodium bicarbonate an exceptional, versatile compound. Over the years, it has become a key ingredient with hundreds of applications, from housework to personal care and healthcare. Our production methods allow us to produce high-quality sodium bicarbonate that is great for any application, especially personal care.

HOW TO USE OUR SODIUM BICARBONATE IN COSMETIC APPLICATIONS?

- **Foaming Soap**: effeverscent; deodorant/anti-odor
- **Toothpaste**: whitening smooth abrasive; deodorant/anti-odor; mild scrub
- **Roll-on-deodorant**: deodorant/anti-odor;
- **Exfoliating cream**: mild scrub

NATURAL & ECO-FRIENDLY

SEQENS Mineral Specialties ISO 9001, ISO 14001, ISO 50001, and OHSA 18001 certified and a member of the worldwide Responsible Care® charter. We have implemented the HACCP methodology in all of our processes. Some of our products are also Kosher and Halal certified. Overall we strive to promote sustainable development in daily life.

EASY TO FORMULATE: WHITE & SOLUBILITY

Our sodium bicarbonate grades are pure, white (L > 99%), free-flowing powders. They are completely water-soluble, allowing for clear water solutions up to 80g/L. All of this makes it very easy to incorporate into any personal care application, particularly for skin care or oral care.