

Cosmetic Formulation Basics – Toothpaste

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Toothpaste

Toothpaste is a semisolid product designed to clean teeth and leave breath smelling and feeling fresh. While it can be considered a cosmetic, it is almost always classified as a drug because fluoride (a drug active) is included.

What toothpaste does

The primary function of toothpaste is to remove debris from the teeth surface. The most acceptable forms of toothpaste are easily extruded from the package, stay stiff enough to remain on the toothbrush, have a consumer acceptable taste, and foam adequately.

How toothpaste works

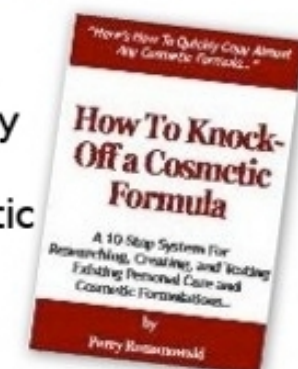
Toothpastes are a blend of surfactants, abrasives, water, humectants, anticaries actives, thickening agents, flavoring, and other aesthetic ingredients. When the toothpaste is put on the toothbrush and scrubbed in the mouth, the surfactants help remove the hydrophobic materials. Abrasive agents help to remove stains and the anticaries ingredients help kill plaque causing bacteria.

Ingredients



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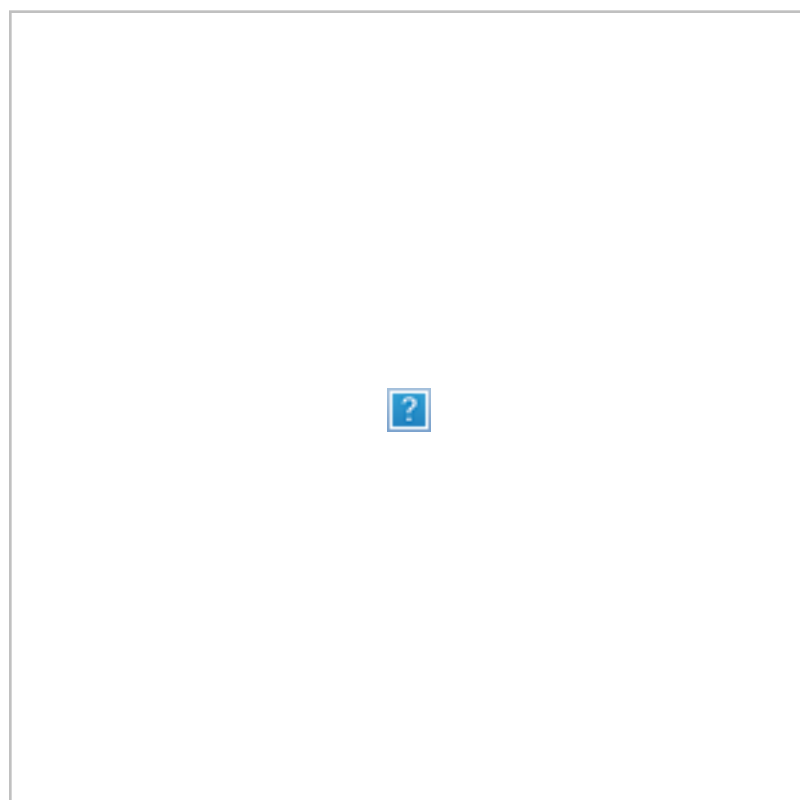
Since teeth are such a hard surface, the abrasive ingredients are required to help clean the surface of the teeth. A number of different abrasives may be used including hydrated silica, calcium carbonate, and dicalcium phosphate dihydrate. The key to a good abrasive ingredient is the size, shape, brittleness, and hardness of the particles.

To create foam and to aid in removal of hydrophobic materials surfactants that are tasteless, nonirritating and high foaming are used. While foaming isn't required for good cleansing, consumers do expect it so cosmetic chemists have to consider this when formulating. The most common surfactant used is Sodium Lauryl Sulfate. For companies who want to avoid SLS, sodium lauroyl sarcosinate and sodium methyl cocoyl taurate may also be used. Bleaches like hydrogen peroxide and urea peroxide may also be added to make teeth look more clean.

The anticaries actives are fluoride ions delivered from some salt. These include sodium fluoride, sodium monofluorophosphate, and stannous fluoride. In the United States, the amount that you can use is dictated by the anticaries monograph.

A number of ingredients are added to improve the aesthetic characteristics of toothpastes. To keep toothpaste from drying out humectants are added. These include materials like glycerin, sorbitol, and xylitol. Thickening agents like tragacanth gum, cellulose gums, and carrageenan are used to keep the product on the toothbrush. Flavorings are added to make the use experience more pleasant. Common flavorings include cinnamon, clove, menthol, and mint. Other ingredients that round off the formulation include preservatives, colorants, and desensitizing agents.

Below is an example of a typical toothpaste formula.*



*Formula from Harry's Cosmeticology

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