

Just Plain Soap

Have you ever wondered just what is in that bar of soap you use? (Actually, it is just as important to ask what is *not* in it, too.) Many people don't know how soap is made or what makes one brand better than another. It is just not something that we take the time to look into. But as with most things, when you understand something, you can make smarter choices about what is best for your own use.

If you grew up on a farm, you probably watched someone make soap. It took on the term "lye soap", and it got a really bad reputation for being harsh. "It didn't stop at the dirt" was the old saying. Well, believe it or not, soap is still made by the same chemical reaction. The difference is that present-day oils and caustic are more pure than what they had on the farms back when, our understanding of soap chemistry is more highly developed now, and our ability to weigh and measure things precisely is much better. In short, modern soap is just a highly refined version of old fashioned soap.

Well, mostly.

There are some differences, and as you might expect, it has to do with sales and marketing. So let us set off on a short journey to understand soap. This new knowledge might make a difference in your life.

How is soap made? What are the raw materials?

Soap is made through a centuries-old chemical reaction called saponification.

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There is evidence that a soap-like substance was made in ancient Babylon, according to the inscriptions found on some of the clay pots found there. Ashes were mixed with animal fats, and ashes were one of the early sources of caustic.

Another old story, in this case almost certainly a legend, from the Roman Empire days, that serves to illustrate how soap is made. The story goes that the people who washed their clothes in the rivers and streams of old Italy found that their clothes got cleaner if they would go just down from the places used for burnt offerings. This makes sense, because in a burnt offering, you have all the ingredients for soap. The fire makes ashes, which contains potash, and when the rains came, the caustic would be produced. The fat from the animal offered in the sacrifice has fat, and some of it would drip down into the ashes. Mix the two

together, and you get soap. The soap would run down into the stream, and it would help to get the dirt out of your toga.

In any case, soap making is a very old art. Here is how you do it: You mix vegetable oils or animal fats together with a water solution of caustic soda. That's it. Then you let Mother Nature take over. The chemical reaction that ensues does the rest.

Soap Chemistry

Unless you want to formulate your own soap recipe, all you need is a very basic understanding of chemistry to understand the saponification reaction. The oils are *triglycerides*. A triglyceride is made up of a glyceride molecule attached to three fatty acid chains. When the caustic is mixed with the oils, the fatty acids break loose from the glyceride, join with the sodium in the caustic, and form soap. The glyceride turns into glycerine and goes free.

So here is a short version of soap making: oils plus caustic makes soap and glycerine. The rest of the details, such as how much oil can react with how much caustic, and how you process the soap as the reaction proceeds, will be left to those who want to do a little research. There are many good books on the subject.

Nearly all grocery store soap (list a few that have 80/20 soap base) start with 80% tallow and 20% coconut oil, react them with caustic soda, remove all the glycerine, and then start adding the additives.

(Table here)

What about the glycerine?

As we said, soap making naturally generates glycerine. Glycerine is called a humectant, and it is a natural skin moisturizer. But most of the bars of soap you see on the shelves at the grocery store don't mention glycerine as one of the ingredients.

- The big guys take it out
- Why?
- WWII England
- Moisturizing
- "Glycerine" soap is not transparent soap

- Some transparent “soap” is not even soap (examples)

What is soap?

Chemistry

- Ancient process, still used
- Oils plus caustic soda (lye)
- TWO things are produced: Soap and Glycerin

History

- ancient Babylon (2800 BC)
- Myth of Mount Sapo
- WWI, WWII

Why is some soap better for your skin than others

Additives

- Put Spitz’s table in here? Or list a few of the additives in most bar soap
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Subtractives

- Tell the glycerin story.

Synthetic Detergents

Next time you are in the grocery store, pick up a bar of Dove or Caress or Olay soap, and look at the ingredient list. It will say something like “sodium cocoyl isethionate” as its first listing (which is the principal ingredient). What you will have in your hand is a bar of synthetic detergent, not soap. So, just how does this new substance compare to soap? Before we get too far into this, let’s have a look at history once again.

Along about the time of The Great War (now called the First World War), things got a little tense in Europe. The normal raw materials used for soap became scarce because there were blockades to shipping and imports, so they set out to create an alternative to soap. Coal was abundant, and coal can yield a type of oil similar to petroleum, and the chemists came up with a new substance: linear alkyl benzene sulfonate, or LAS for short, which was the first detergent.

LAS acts like soap because it can form an emulsion, meaning that it can mix with either oil or water. But there is a twist. Detergents don't form a bathtub ring! True soap will interact with hard water to form a substance called "soap curd" which is insoluble in water. It sticks to the sides of the bathtub and is hard to wash off.

What is detergent, and how is it different from soap?

- Detergent history
- Detergent chemistry
- Detergent additives
 - Antiredeposition agents, fluorescent whitening agents, builders, bluing

Who can benefit from a really pure soap

- People with allergies to the additives in some soaps
- People with sensitive skin, dry skin
- Hunters (for the reasons of)
- People who want pure products for their personal care