



A Beginner's Guide to Making Homemade Soap

What You Need to Get Started

Supplies:

Two large glass, ceramic, or stainless steel bowls or pots.

Large stainless or wooden spoon (don't reuse wooden spoon for food).

Safety glasses.

Rubber gloves.

Non aluminum molds (Aluminum reacts with the lye).

A kitchen scale.

Oil

Sodium Hydroxide (Sold as Lye as a drain opener in most markets).

Optional:

Two low temp. thermometers.

An Introduction to Soap:

First things first: Soap is the end result of a process called saponification by which oil chemically alters due to the presence of a strong alkali. As a result of this process, soap at 93 percent and a by-product called glycerin at 7 percent are produced. Soap is of course the cleaning agent that we are all familiar with, and glycerin is a clear extremely emollient substance which is normally removed by soap manufacture's to the detriment of the soap. Detergents on the other hand are made out of petroleum by a different process.

Any natural oil either plant or animal can be used to make soap, although some are definitely better than others. Olive oil for example makes a very high quality soap and is the oil used in the highly esteemed Castile soap named for the same region in Spain. Beef tallow also makes soap with a hard body and good lather but not as mild as olive. The chemical mumbo jumbo on ingredient labels refer to these oils as Sodium blah blah blah. The blah being exchanged for tallowate (tallow), palmoate (palm oil), cocoate (coconut oil) etc. More information on the properties of soaps made from the different oils will be discussed in the next section.

Soap making in it's simplest form is quite easy to learn and safe as long as a little common sense is employed. The main issue is that a very strong alkali solution is needed to get soap to saponify, which will burn

skin and cause blindness, as human eyes are very sensitive to alkalis. Make sure to always wear your gloves and glasses when dealing with the lye solution, and label everything! Treat the lye with respect and there should be no problems.

The Different Oils :

As stated previously any natural organically derived oil can be used in the soap making process, and the characteristics of the final soap depend on which oils are used. Mineral oil and other petroleum products will not saponify for the home soap-maker. Here is a short list of some oils and their basic effects.

Main oils:

Olive: Very hard bar that is long lasting, very mild and slick, with a moderate amount of small creamy bubbles. This makes a wonderful addition to any bar of soap so use lots! Very slow to trace (discussed later), and moderate to set, so use stearic acid or palm oil to speed it up.

Coconut: Hard bar with very powerful cleaning action, and lots of large thin bubbles. Very quick to trace and moderately fast to set. This is the oil to use if you want loads of lather. Try to keep the total amount of coconut below 25% though to keep the soap from being too harsh.

Palm: Very hard and mild bar, with small bubbles and is quick to dissolve. Quick to trace and set. This is a very nice oil to have around giving some lather and a nice texture to soaps. Palm oil can be quite inexpensive and can be found at most Middle Eastern stores by the name of Vegetable Ghee.

Hydrogenated Soy/Cottonseed Oil (Shortening): Hard bar with moderate lather and very long lasting. Quick to trace and set. It's inexpensive, readily purchased, and makes a good soap oil. If a utilitarian soap for the least amount of money is your desire, then go get a few pounds of shortening.

Cocoa Butter: Very hard, mild, and extremely emollient bar that gives the bubbles of other oils density. This is a very nice and also a very expensive oil to use in soaps. It gives a very nice texture and richness to your special soaps.

Grape Seed: Smooth and emollient, used to give moisturizing qualities to soaps. Very slow to trace and set and very soft. Use 1 - 2 oz. per pound of oils.

Avocado: This is a very nice oil! Extremely soft and emollient, with lots of nutrients for the skin. Unfortunately it is also usually a very expensive oil. Mix with grape seed oil to make a wonderful massage oil.

Almond Oil: This is a nice moisturizing oil with a slick feel. Use as you would grape seed or avocado to add silkiness to your soaps.

Beeswax: This can be added to make soaps harder and set up faster and also helps arrest ash formation. Usually not used at more than .5 oz. per pound of oils. Bee keepers are a good source for this wax.

Stearic acid: A kind of wax usually derived from the palm, 1/2 - 1 tablespoon added per pound of oil speeds trace and hardens the bar. It will make olive oil soap trace in as little as 15 minutes as opposed to 2 days!

Other: Most other oils commonly found in the supermarket (aside from Peanut and Sesame) all make very soft bars, and are best used for liquid soaps. Liquid soap is made simply by adding water very slowly a spoon full at a time to the traced soap.

Let's Get Started:

Now on to the main event! Step by step instructions on how to make soap, and a few basic recipes to get you started right away.

The first thing you need to do is assemble all of the ingredients and supplies listed on the first page. Measure the water in one bowl and add the recommended amount of lye, stirring until dissolved. The solution can get very hot (boiling) so use cold water to keep the temperature down. It will also emit some rather obnoxious fumes for the first minute or two so you should have some good ventilation for your work-space. Always use distilled or filtered water as impurities can keep the soap from saponifying correctly.

Now measure the oils and heat them in the second bowl until heated and fully melted. The temperature of both the oil and the lye water should be close to the same, at around 120 degrees. If you need to heat the oils higher than 120 degrees do so and then let cool to the proper temperature. Cooler than this and the chemical reactions are slowed down; too hot and the soap will effectively curdle (in which case your only option is to mill the soap after a day or two). Now slowly add the lye solution to the bowl of oil while stirring constantly.

Continue stirring with only brief pauses until the soap is emulsified and starts to thicken and show trailings. Trails can be detected by lifting the spoon from the mixture and drawing lines on the surface. The main thing is to keep the lye and the oil from separating until the lye can turn the oils into soap. When the lines on the surface stay for about 2 seconds the soap is around 90 percent saponified and is said to be at light trace. Some oils such as olive will take a long time to trace and set, in which case the soap mixture should be kept in the main bowl for a day or two before pouring into molds. The oil that separates should be stirred in occasionally over that time.

After the soap has traced it is time to add any last minute ingredients that you might desire. These may include essential oils, coloring agents, or abrasives. Waiting until light trace to add these lessens the tendency of the lye to destroy their structure. Herbs and other delicate additives can turn black and lose most of their properties even if added at trace, and should instead be added to a milled soap.

Now is also the time you may add any moisturizing oils to your soap. Oil added after light trace above and beyond what is needed for complete saponification is called superfatting. By adding the extra oil at trace most of the saponification has taken place, leaving most of the added oil free to do its job moisturizing. This gives you a lot more control over which oils are left over when the soap cures. The average percentage of free oils in soap usually ranges between 3-9 percent by weight. Less than this amount and the soap may be lye-heavy and harsh; more will soften the bar and may cause the free oil to go rancid.

It's now time to pour the soap into your molds to set up. Any non-aluminum flexible mold will work such as plastic, wood or food tins. Insulate the molds to keep the heat in so they will cool slowly: this helps prevent separation and residue formation. If a white powder does

form on the top of your soap don't worry! It's just some minerals and impurities known aptly enough as ash. Your soap will work just as well with or without it, and if it bothers you then shave the thin film off.

Keep the soap in a warm place for a few days or weeks to set up and begin to dry. After the soap sets up it should begin to pull away from the molds slightly and should remove fairly easily. If it doesn't want to come out don't force it, just give it another week and try again. If all else fails put them in the freezer to firm them up before removing. After you remove the soap from their molds continue to let it cure for at least another three weeks before use. The longer you let it cure, the firmer the bar will become and the lower the chances of free lye remaining in the soap. The soap will cure faster at warmer temperatures. If you have added any scent, you may want to wrap the bars in some nice paper wrapping for gifts, or store them in an air tight container once done curing. Enjoy your soap!

Milling your soap:

Milling is the process of melting the partially cured soap and returning it to a liquid consistency. The resulting bars are harder and have a nicer texture than soap that has not been milled, although I usually only mill soap if it has curdled or if I want to add fresh ingredients that would be damaged by the lye in the fresh soap. Try milling a small batch yourself and see if the rewards match the effort.

Like the rest of the soap making process, milling is basically straight forward but it can be a little tricky. There are three main ways to mill soap: over a low flame, using a double boiler, or in a low temperature oven. The key principal to keep in mind is that the soap needs to melt very slowly in order not to scorch. "Slowly" in this case means an hour on the stove or up to 2 - 3 hours in the oven. The temperature should be no higher than around 190° to keep the ingredients from boiling. The stove top method takes the most attention and is the quickest, followed next by the double boiler. With the double boiler method you can be a little more confident that your soap won't scorch. The oven method takes the least amount of effort but the most time.

Start the milling by getting two parts of freshly made soap no more than a week old and grate it into small pieces in a non-aluminum container. To this add one part water and stir gently to evenly coat the

soap. Be careful during these steps not to stir too rapidly or the soap may foam up. It's also a good idea to use a lid on your vessel to keep the moisture in. Keep an eye on the mixture to make sure it doesn't get too hot, and stir at intervals to melt everything evenly. The melting can sometimes be elusive, but be diligent and the soap should melt in time. It may never become completely liquefied however, in which case add enough liquid to make it thin enough to pack into your molds but no more than is necessary. Too much liquid won't hurt your soap, but there will be a lot of shrinkage and it may take a long time to dry.

You may also want to try a boil in a bag method as well. Use a high temperature bag, place everything inside and tie the top. Now put it into some simmering water and squeeze now and again with a wooden spoon to melt it evenly.

Once it looks like the soap is melted thoroughly it is time to add any ingredients you may wish and pack your new soap into molds. After this, treat the soap as you would fresh soap and insulate for 24 hours to cool slowly. Let it set up for a few weeks then remove from the molds to dry. There you have it—hand milled soap of your very own.

Recipes:

Now that you know how to make soap, you probably would like a few recipes to get you started. These recipes should all be measured carefully on an accurate kitchen scale to avoid problems. Keep in mind that small differences at the start can mean big changes to the final product. The oils should also not be substituted as they each need different amounts of lye to saponify fully. Each of the following recipes will yield a soap with approximately 6.5 percent free oil. Exact predictions can't be made, for the same type of oil can vary somewhat.

Feel free to scent these soaps as you wish but don't use anything that may have alcohol or sodium as an ingredient, as these may cause your soap to separate. Also make sure to over-scent/color the soap as both tend to fade. A little powdered Orris Root added to the mix will help act to stabilize the aroma.

Castile Soap

Ingredients:

16 oz. wt. Olive Oil

6 oz. Water

2 oz. wt. Lye (Sodium Hydroxide)

Instructions:

This is a very slow soap to trace, but once dry is quite hard and very mild. The oil will tend to separate for the first day or two. Just stir it in to reincorporate whenever you see a film.

Three's Company

Ingredients:

7 oz. wt. Olive Oil

5 oz. wt. Hydrogenated Soy Oil (Shortening)

2 oz. wt. Coconut Oil

6 oz. Water

2 oz. wt. Lye (Sodium Hydroxide)

1 oz. wt. Olive Oil

Instructions:

Add the 1 oz. of olive oil at trace. Quick to trace, and mild. This is a good, all around bar of soap that has a good texture and nice lather. Scent or color as you wish or leave as is and enjoy the clean smell of soap.

Coffee Soap

Ingredients:

8 oz. wt. Olive Oil

4 oz. wt. Coconut Oil

2 oz. wt. Hydrogenated Soy Oil (Shortening)

2 oz. wt. Sesame Seed Oil

6 oz. Extra strength coffee

2.2 oz. wt. Lye (Sodium Hydroxide)

Instructions:

Brew triple-strength coffee, and use it in place of water. This makes a very good odor absorbing soap for the kitchen and shop. You might also want to add a tablespoon or so of fine grounds as an abrasive.

Honey Soap

Ingredients:

6 oz. wt. Olive Oil
4 oz. wt. Palm Oil
3 oz. wt. Coconut Oil
2 oz. wt. Cocoa Butter
0.5 oz. wt. Beeswax
6 oz. Water
2.25 oz. wt. Lye (Sodium Hydroxide)
0.5 oz. wt. Honey
1 oz. wt. Grape Seed Oil

Instructions:

Add in the honey and grapeseed oil at a heavy trace and stir until everything is well blended. This makes a very nice moisturizing bar with a light scent of honey and chocolate. A very nice mild soap and a pleasure to use. Add a half teaspoon of powdered tumeric or paprika for a deeper orange color.

Herbal Shaving Soap

Ingredients:

6 oz. wt. Olive Oil
4 oz. wt. Palm Oil
4 oz. wt. Coconut Oil
1 oz. wt. Cocoa Butter
2.25 oz. wt. Lye (Sodium Hydroxide)
6 oz. Herbal Tea
1 oz. wt. Avocado Oil

Instructions:

Brew some strong herbal tea, and use it in place of water. Superfat at light trace with the avocado and blend well. This is a nice soap with a good lather perfect for a close shave. For added slickness add a tablespoon of a fine powdered clay such as Kaolin or Bentonite.

That's it for the recipe section, choose one that sounds interesting to you and go make some soap!

Saponification Values:

Design your own recipes, using this lye to oil ratio chart. Oil by weight, times the Sap value, equals the amount of lye needed. If you are using more than one type of oil in a recipe, do the above step for each oil and add your results together to get the total amount of lye needed for complete saponification. Use approximately 6 oz. of water for every 16 oz. of oil.

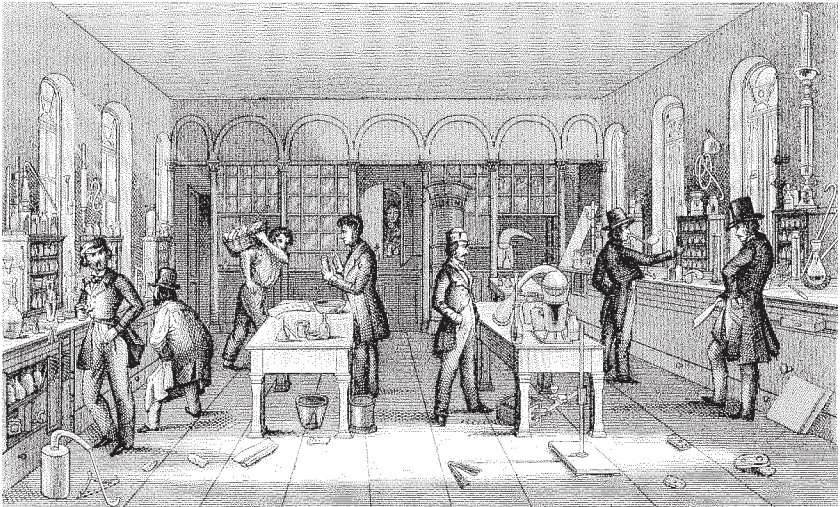
Note: This will yield a soap with no free oil. Add 1 oz. of extra oil per pound to get a bar with approximately 6 percent free oil. Or more accurately: Sap Value * (oz. Oil - oz. Oil * .06) (The decimal is the percent of free oil desired)

Oil	Sap Value
Almond Oil (Sweet)	0.136
Apricot Kernel Oil	0.135
Avocado Oil	0.133
Bees Wax	0.069
Canola Oil	0.124
Castor Oil	0.1286
Cocoa Butter	0.137
Coconut Oil	0.19
Corn Oil	0.136
Cotton Seed Oil	0.1386
Crisco	0.1368
Grape Seed Oil	0.1265
Jobba Oil	0.069
Linseed Oil	0.1357
Olive Oil	0.134
Palm Kernel Oil	0.156
Palm Oil	0.141
Peanut Oil	0.136
Poppy Seed Oil	0.1383
Pumpkin Seed Oil	0.1331
Safflower Oil	0.136
Sesame Seed Oil	0.133
Shea Butter	0.128
Soybean Oil	0.135
Sunflower Seed Oil	0.134
Walnut Oil	0.1353
Wheat germ Oil	0.131

Enjoy your soap!

This booklet is the result of hours of research and experimentation. In a world of increasing dependence on mass-produced items, basic skills like soapmaking are becoming lost. We began our journey after asking ourselves the question, "How do you make this?" and, realizing that we did not know the answer, felt the need to find out.

We have published this in the interests of free information...may you all learn and enjoy soapmaking as much as we have!





Written in 1998 by Roger Quennell

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