My Soap Making

A useful web site http://www.millersoap.com/ .

Besides the ingredients listed below you need an accurate scale and one or two good thermometers that will measure in the 95 to 110 F range.

It is important to note that the oils are proportioned by **weight**, as is the lye. The water can be measured by volume though.

COCONUT-PALM-OLIVE-SOAP

Ingredients	**Full recipe**	**Half recipe**
Coconut oil (by weight)	624 grams	312 grams
Palm oil (by weight)	748 grams	374 grams
Olive oil (by weight)	1122 grams	561 grams
Sodium hydroxide (NaOH) (lye) (by weight)	354 grams	177 grams
Cold water (by volume)	650 to 900 ml	325 to 450 ml

Note: Light olive oil will produce a more white bar of soap. Extra virgin olive oil produces soap with a darker tone. Both work well. No need to adjust the weight of the il for type of olive oil.

A good digital scale is required. If the proportions are not accurate the soap could end up with too much or too little lye. Either is not good. If there is too much lye, well, that is where lye soap got the bad reputation for being harsh on the skin. The above proportions will leave a slight excess of oil in the cured soap bars. That is fine, maybe good for ones skin.

The water volume is not as critical as the oil and NaOH. Using the higher amount of water makes it easier to pour and level in molds. However, more water used means the soap will take longer to cure as much of the water evaporates as the soap hardens. I tend to use somewhere between minimum and maximum.

The process of the NaOH combining with the oil is known as saponification. You cannot replace one oil with another type without adjusting the quantity of the oils being sapped. Different have different SAP values. There are web sites with oil substitution calculators.

First get everything you need. I found NaOH at my True Value hardware, in the plumbing dept, sold as drain cleaner. Lye is sodium hydroxide. In Canada and the UK I believe it is called caustic soda. Be warned that not all drain cleaners are 100% lye; that is important. For example, some powdered/crstalline versions of Drano contain powdered aluminum (a marketing thing as that makes the drain cleaner bubble and is supposed to give the impression that it is “working”).

The NaOH, which is powder or crystals, is first dissolved in COLD water. I use ice water. NaOH can be dangerous to handle. Dry NaOH on the skin can burn because the skin may have enough moisture to activate the lye. Rubber gloves and eye protection is advised. It might be a good idea to mix the NaOH and water outside. The fumes are not good for you to breath or have in your face.

Always add the NaOH to the cold water while stirring. Always.

If your water has a high mineral content the soap may turn out better if you use distilled water.

Never add water to dry NaOH; it will spatter all over from the great heat released from the chemical reaction. I use a water/ice mix to get the coldest water possible to start. I remove all the ice before measuring out the volume of water I need, then add the NaOH while stirring. The temperature of the 12 to 13 ounces of ice water very quickly rises from 32 F to about 160 F! Mix this first so it has more time to cool.

Use wood or stainless steel or some plastics for the stirring spoon. Do **not** use aluminum pots, utensils, etc. at all at any point in the process. I mix the NaOH into water in a Pyrex glass measuring cup. The mixture gets very hot when the lye is mixed into the water. Be careful. The lye water mix should be cooled to about 95 F (35 C) before use.

Coconut oil arrives as a solid. I buy mine at the grocery store, same as the olive oil. Palm oil can be found on eBay. Weigh out the quantity of coconut oil carefully, place in the pot (I use stainless steel) and melt over low heat. Weigh and add the other oils to the melted coconut oil. The oil should be at about 110 F (43 C) maximum. I try to hit 100 F (38 C) for everything before I begin to combine the oil and lye water.

Now the NaOH solution is added to the oil mix while stirring. After adding the NaOH water to the oil place the NaOH water container in the sink and run copious amounts of water through it. Stir the oil/lye mix being careful to not introduce air bubbles. I did the stirring on the range top just in case I needed to apply a small amount of heat.

Stirring with a spoon can take an hour. However, a stick blender amazingly speeds up the process. After about ten minutes the mix should be thicker, like thin pudding. Dribbles of the mix back in the pot should not immediately smooth out.

I have used an 8 x 8 x 2 inch glass baking dish (Pyrex) for the mold. It holds a half recipe well. Downside is the curved side to bottom which gives some odd shaped cut bars. I lined it with plastic wrap to aid removal of the finished soap.

I made a wooden, adjustable mold. Pictures below and attached separately to the email. The wooden mold comes apart to make removing the soap easier. I line it with freezer paper to aid in releasing the soap.

For the half recipe I set my adjustable length box mold to 13" long x 3.5" wide x 2.5" tall. (33cm x 9cm x 6cm). This volume is not quite filled by the half recipe. I pour the soap mix into the mold and then reposition one or both end blocks to shorten the mold space and make the soap level more or less at the height of the sides.

The range oven should be slightly warmed beforehand, but be sure the oven is turned off before you continue. A pan of warm water is placed in the warm oven along with the soap in the mold. The door is shut and the oven light left ON. The oven light adds enough warmth to aid the soap making process. Do not open the oven (or use it) for 24 hours. Using the oven saves the trouble of wrapping the soap mold in blankets or towels.

The saponification chemical reaction continues in the mold box. This is an exothermic reaction; heat is produced.

24 hours later remove the soap mold from the oven. I lined the glass baking dish used as a mold with plastic wrap try to make separation easier. It worked well. Once the soap block is out of the mold it is solid enough to hold its shape but still easy to cut. Cut to whatever bar size is desired. I use a carving knife with a thin blade. Place the bars on a rack so they do not touch, allowing air to circulate. Ideally the bars should dry and cure for 4 weeks or more before use. I do not wrap the individual bars, but after 6 to 8 weeks I usually package most of the soap bars in one or two small cardboard boxes and place them in the freezer. The half batch lasts me about a year or more. Because there is a small amount of excess oil I like to store them in the freezer to help avoid any excess oil developing a rancid smell. That occurred one year when a bar was left in the small camper for over a year. It smelled slightly off but worked well with no residual odor.


WESTCOTT® Flexible Stainless Steel Rule