Soap Making Made Easy

Everything you need to jump-start the process of making your own soap, at home!

Michelle Gaboya

2nd Edition

http://soapmakingadvice.com

Acknowledgements

Michelle Gaboya has been a soap making enthusiast for over 10 years, creating all types of elegant homemade soaps for family, friends and various occasions.

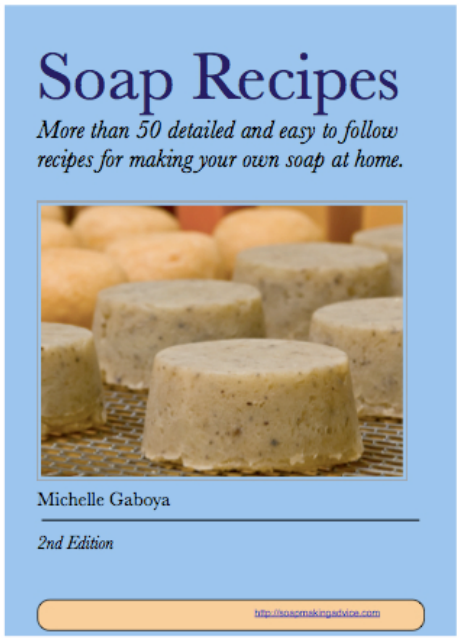
As an avid enthusiast she has accumulated a wealth of experience in the field of soap making and is a recognized personality amongst the soap makers' community. She takes great pleasure in sharing her knowledge and experience with other keen soap makers. Michelle continues to hone her craft and experiment with new designs and formulas regularly.

This book would not have been possible without the dedication of Michelle and her patience to commit all of the following from her own knowledge onto paper. You can get more information and regular articles on the Soap Making Advice blog.

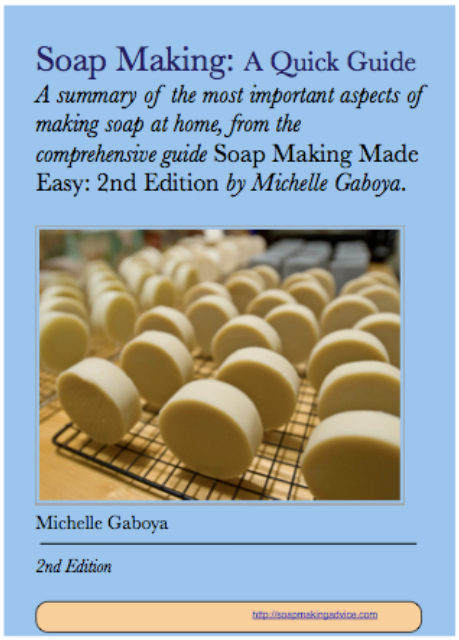
Many thanks Michelle.

Soap Making Advice titles

If you have found this quick guide useful, please consider Michelle's other titles:



Soap Recipes: A detailed and easy to follow recipe book with more than 50 unique recipes, from cold process soaps, to melt and pour soap, shampoo soaps, liquid soaps, exfoliating soaps and many more. Available in ePub format for use with any Ebook readers, smartphones or tablets, or in PDF format.



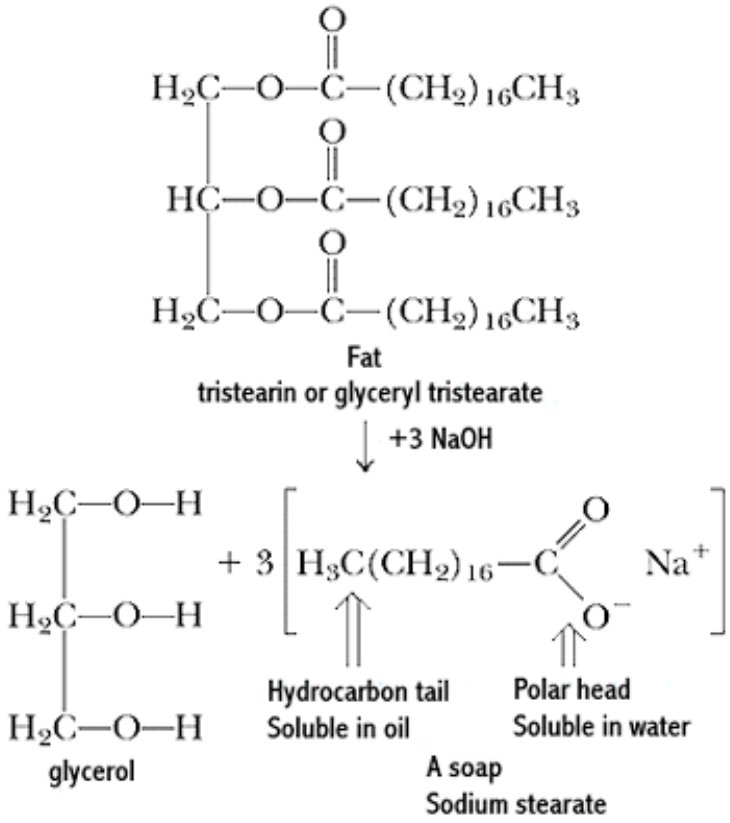
Soap Making: A Quick Guide: A summary of the most important aspects of making soap at home, covering all the basics. Handy to use as a quick reference guide. Based on the comprehensive *Ebook Soap Making Made Easy*. Available in ePub format for use with any Ebook readers, smartphones or tablets, or in PDF format.

You can get more soap making tips and information as well as regularly published articles on the Soap Making Advice blog.

Table of Contents

What is Soap?

Soap is an anionic surfactant which, when mixed with water, is useful for washing and cleaning. It can be made in either bar or liquid forms. In terms of chemistry, soap is a sodium or potassium salt, which is formed via the chemical reaction between an acid and a base. This reaction is commonly known as neutralization.



The oils or fats used in the soap-making process combine with sodium hydroxide, or lye, in a process known as saponification. The fats are hydrolyzed by the lye, yielding fatty acids and glycerol. Today, traditional soaps are often replaced with synthetic detergents, or other surfactants.

The fats and oils used to make soap are made up of triglycerides. A triglyceride is a molecule that contains three fatty acid molecules, which are attached to one molecule of glycerin. The other major component of soap, lye, is an alkali; or a base (the opposite of an acid, on the pH scale).

There are two major types of lye: sodium hydroxide (NaOH, caustic soda, or potash), and potassium hydroxide (KOH, or caustic potash). Sodium hydroxide is the one typically used when making solid soap bars; potassium hydroxide makes much softer soap, and is sometimes utilized for making liquid soaps, or shaving cream.

The lye reacts with the triglycerides in the fat or oil molecules, and the fatty acids are released from the glycerin, and bind to the lye molecules. Both the alkali and the acids are neutralized. The byproducts of this reaction are a salt (soap) and glycerin.

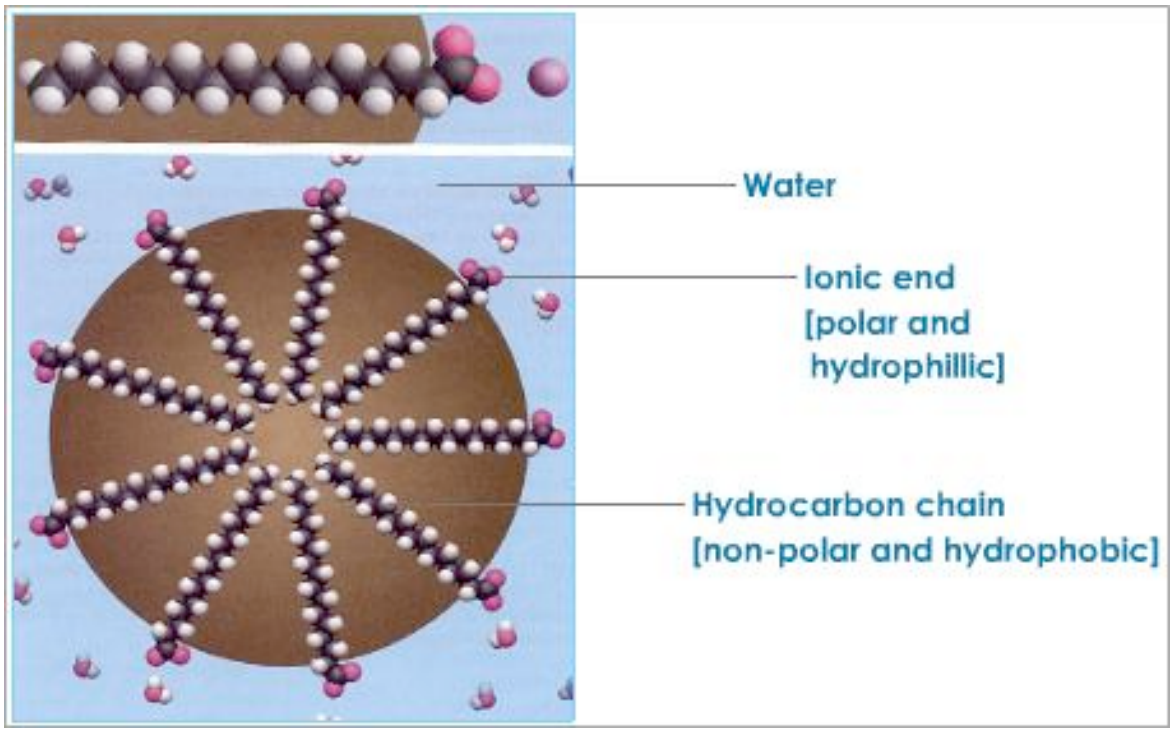
When the process is complete, there will be a ratio of approximately three soap molecules to every molecule of glycerin. Put another way, glycerin makes up approximately 25% of the finished product that results from the saponification process.

How Does Soap Work?

Soap acts as an emulsifier, meaning that it allows one substance to be dissolved into another, into which it would not dissolve otherwise. Soil contains grease and oil, which are not water-soluble; however, soap attaches itself to the grease molecules, loosens them, and allows them to dissolve in water, and be rinsed away.

There are three types of energy which must be present in order for soap to work well: chemical energy, thermal energy, and kinetic energy. The chemical energy is provided by the soap, and allows soil that can't be removed with just water to be loosened from the soiled surface, and suspended within the soap molecules. Thermal energy is provided by using warm or hot water. The third type, kinetic energy, is created by movement – washing machine agitation, or old-fashioned elbow grease.

If any of these elements are missing, the cleansing process will not be as effective; for example, soaking soiled clothing in soapy water, without scrubbing or agitating it, will not get it as clean as if it were put in the washer. Similarly, attempting to remove soil with only water, and no soap, is likely to be ineffective.



Soap molecules have two ends; one is a carboxylate, and the other is a hydrocarbon chain. The carboxylate end of the molecule is hydrophilic ("hydro" meaning water, "philic" meaning attracted to), while the hydrocarbon chain is hydrophobic (meaning repelled by water). Nearly all substances are either hydrophilic or hydrophobic; anything that will dissolve in water is considered hydrophilic. Anything that won't, is considered hydrophobic.

Naturally, oil and water don't mix, because oil molecules are hydrophobic. Most soil contains some variety of oil, which means that it will not dissolve in water without the help of an emulsifier, such as soap. The hydrophilic end of the soap molecules allows the soap to be water-soluble, despite the oils contained in it. The hydrophobic end is the portion that allows the soap to grab onto the grease molecules.

Grease normally adheres to skin and clothing; however, the hydrophobic ends of the soap molecules form micelles, or tiny clusters, which surround the grease molecules. The grease is held by the hydrophobic end, while the hydrophilic end allows the suspended grease particles to be rinsed away with clean water.

Water hardness is a factor that greatly impacts the efficacy of soap. Hard water refers to water that has an overabundance of minerals, such as calcium, iron, manganese, or magnesium. When the soap is used, some of the soap molecules attach themselves to these minerals, instead of to the soil that is supposed to be cleansed. This creates a twofold problem; there are fewer soap molecules available for cleaning, and the molecules that react with the minerals create a hard scum on fabrics, skin, or other surfaces.

Because most soap molecules are fairly similar, and not very versatile, many commercial soaps now use synthetic surfactants or detergents, which, because of their chemical composition, can be engineered to be effective in a variety of conditions. The downfall of synthetic detergents, however, is that they can be harsh and drying to skin – imagine washing your whole body with dishwashing liquid, or glass cleaner. It works well on your kitchen or bathroom surfaces, but you wouldn't want it all over you.

This is why many commercially-made soaps are drying to the skin; they are engineered to work in hard-water conditions, which means that they are more harsh than plain soap.

The Differences Between Hand-Made and Commercial Soap

For obvious reasons, handmade soap will result in a greater degree of customization for the soap-maker, and the consumer. Hand-made soaps are often more gentle on the skin than commercially manufactured cleansers. Mass-produced soap sometimes utilizes oleochemicals, derived from fats and oils; other soaps contain petrochemicals, which are derived from oil and fossil fuels. Many people begin making their own soap because they don't like the idea of using petrochemicals to clean themselves, or because of the environmental impact of these chemicals.

Glycerin is a by-product of the soap-making process typically favored by commercial soap-makers, known as the full-boiled method; the glycerin is typically removed after the process is completed, and sold as a valuable humectant, or moisturizer. When the glycerin is removed, in commercial soaps, the result is a pure detergent, which can be drying or irritating to the skin. With the glycerin still in the soap, it stays naturally moisturizing, and is also less likely to crack and fall apart than commercial soaps. Also, for those who make their own soaps, processes like

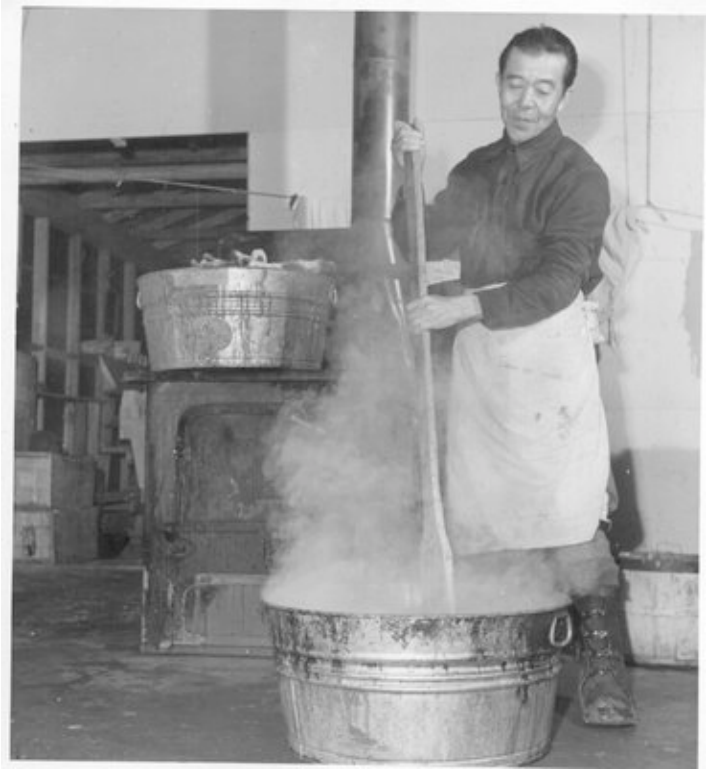
superfatting, or adding certain skin-friendly ingredients, can yield a result that is not as harsh as commercial soaps, for sensitive or chronically dry skin.

Making soap by hand can be an interesting and fun hobby, but it is also great for those who find that commercial soaps are too harsh, or those who want to utilize scents or ingredients that are often not found in the usual store-bought soaps. In addition, natural ingredients are barely used in commercial soap-making, and while they are better for the environment, they also tend to yield a higher quality of product than synthetic detergents and processes.

So, for those who are concerned about the environment, or the effects that synthetic detergents may have on themselves and their loved ones, soap-making can be a highly satisfying experience.

The History of Soap-Making

The earliest record of a soap recipe dates back to 2200 B.C.E. The recipe called for water, alkali and cassia oil, and was written on a Babylonian clay tablet. There is also evidence that the ancient Egyptians bathed regularly, and used a soap-like substance made from animal and vegetable fats, and alkaline salts. By the 900s, soap-making was common in Spain and Italy, and by the 1200s, also in France. In that era, soap typically consisted of goat tallow and lye made from beech wood ash. Unfortunately, because it was difficult and costly to make, its usage was not widespread until the 18th and 19th centuries. The chemical nature of soap, and how it works, was also discovered around this time.



In the early twentieth century, soap was typically made at home, using pig lard, or cow tallow, that was leftover from butchering or cooking meat. The lye was made by combining ashes leftover from fires with water, in an ash hopper. The ash hopper was kept in a shed, or other space where it was protected from precipitation; ashes were added periodically, and when water was poured through them, it leached the lye from

the ashes. The resultant lye water was then collected, and saved for use in soap. To determine if the lye was fit for use, the soap-maker would float an egg or potato in the lye; if the object floated with a portion the size of a modern-day quarter above the surface of the lye, then the lye was good. If it was too strong, water was added to dilute it; too weak, and it was boiled down to the correct strength.

After the lye was ready, the fats had to be prepared for use; this was done by rendering the fats, to remove any impurities, or meat tissue still present in the lard or tallow. Rendering prevented the fats from becoming rancid. (While soap made from rancid fats works just as well, it doesn't smell very nice.) To render the fats, they were added to a large cooking kettle, and an amount of water equal to the amount of fat being rendered was added. The mixture was then boiled until all the fats were melted. More water was added, and the mixture was allowed to cool overnight. By the next day, the fat had all floated to the top, and solidified. The impurities that were in the fat were heavier than the fat itself, and floated in the water underneath. The now pure fat was skimmed off the surface, and stored for use. When the fat and lye were mixed, they produced a brown, jelly-like soap, which was kept in a barrel, and ladled out as needed. Hard bars of soap could be made by adding salt to the mixture to solidify it; however, soft soap worked just as well as hard, and because salt was expensive, and in short supply, the soft soap was typically used instead. Solid soap was usually made only by soap-makers, and was scented with various oils, and sold by the pound to wealthy town and city folk.

However, during World War I, animal fat, like many other resources, was in short supply, because most available resources had to go to the troops. While searching for an alternative material, it was discovered that a variety of vegetable and plant-based oils were useful for the soap-making process. Not only were the vegetable oils useful during the shortage, but it was found that the vegetable oils were actually superior to animal fat for making soap. The soap produced was of a finer quality, and the vegetable oils were more readily absorbed by the skin than animal fat. Also, animal fat can clog pores, and aggravate certain skin conditions.

In later years, mass production made soap-making more efficient, and the quality produced was more uniform. However, the customization of soaps was lost, and the end result, for reasons discussed earlier, was not always as skin-friendly.

Tips for Beginners

Soap-making is a delicate process. The ingredients used must be of a high quality, and the manner in which they are mixed cannot be haphazard or careless. Think of it like cooking. If the ingredients you use are not of a high quality, but you follow the recipe exactly, you will have a less than ideal result. Similarly, if you have the highest quality ingredients available, but instead of following the recipe, you just throw them all together, you will probably not have the result you were hoping for – and the ingredients will be wasted.

The best method for soap making is, first, to ensure the quality of the ingredients you want to use.

Second, choose a tried and tested formula, which has worked well for others. Modify the formula only if you know what the results will be, and have a reason for doing so; each step is vitally important, and if not followed precisely, will not yield the desired result. The ingredients should be measured accurately, and in proper proportion, to ensure a quality product.

Third, be aware of what you are doing, and why you are doing it. It is important to understand the importance of each step, and to be diligent about not leaving anything out. Finally, choose the technique that works best for you.

There are many different techniques, each of which requires different ingredients, and produces a slightly different result. The technique you use will be determined by what you want your product to look, smell, and feel like.

Basic Ingredients

Fats and oils

The fats and oils used in soap can be derived from either animal or vegetable fat. For example, sodium tallowate is a common soap-making ingredient, derived from rendered beef fat; tallow, bacon grease, lard, or any other type of animal fat can also be used. Palm, corn, canola, and olive are all common ingredients for vegetable-based soaps. Typically, soaps made from vegetable oils are softer than those made with animal fat.

The most useful oils for soap-making are fixed oils – oils that can be raised to a high temperature without evaporating. Essential oils typically have to be added at trace, because they tend to evaporate at a much lower temperature. Fixed oils include a variety of base oils, such as olive, palm and coconut oils.

There are two types of fats used for soap-making: saturated fats and unsaturated fats. Saturated fats make a hard soap. They commonly come in a solid form and must be melted prior to use; cocoa and shea butters are good examples of saturated

fats. Unsaturated fats, like some vegetable oils, come in a liquid form, and are commonly used to make liquid soap. To use these fats to make bar soap, they must be mixed with saturated fat; the more saturated fat you use, the harder the bar will be.

Lye

Historically, lye (also called sodium hydroxide, potash, or caustic soda) was hand-extracted from wood ashes. It is now commonly found in many hardware and grocery stores. It is the ingredient that hydrolyzes the oils or fats, and turns them into soap.

Water

The minerals and other additives in tap water make it less than ideal for soap-making. Therefore, it is best to use distilled, bottled, or spring water.

Fragrances and Other Additives

There are two types of scent oils: essential oils and fragrance oils. Fragrance oils are man-made and contain alcohol, so they are typically avoided; the alcohol and other chemicals in the oil may be drying or irritating to the skin, and cause unforeseen problems with the saponification process, or ruin the soap mixture altogether. Essential oils are more costly, and sometimes more difficult to find;

however, a smaller amount is required (usually only a drop or two) and they retain their scent better because they are undiluted. Research oils thoroughly before use; some can be irritating to skin, or even toxic. Also, different amounts are required for different oils, because some will overpower others if the same amount is used for all. (See the Scenting Your Soap section for a more detailed explanation of scents.)

Avoid potpourri, candle scent oils and other strong, commercially-made fragrances, as they often contain harsh chemicals that can be irritating to the skin as well. Whole or crushed herbs can also be used, but they will not give their full benefits in a first batch of soap; if you use herbs, the best thing to do is to rebatch the soap later, to extract the full benefit from the herbs (see Rebatching, under Soap-Making Processes).

Colorants

Colorants can be purchased at a soap-making supply store. There are also various other natural ingredients that you can use to color soap. For example, powdered clay can be used to color your soap pink, pastel green, or beige; it is also a great additive for soap intended for oily or acne-prone skin, because it will absorb oil from the skin without drying the skin excessively, or damaging it. Cocoa powder or tea can be used to turn the soap a deep, rich brown (cocoa powder will, of course, make the soap smell like chocolate). Paprika will give your soap a deep reddish color, and yellow can be achieved by using saffron, annatto seeds, or turmeric. A deep, rich purple can be achieved using ratanjot. (See Table 3 for a more complete list of natural soap colorants.)

Avoid using fabric dyes, hair dyes, candle colorants, or paints to color your soap; even if they are labeled as "non-toxic," they are not safe to have in contact with skin for prolonged periods, and they may dye your skin. Some sources say that crayons can be added to soap for coloration, as long as they are made of stearic acid (most crayons made now are), but there is some debate on this topic; it is probably best to err on the side of caution, and avoid using them.

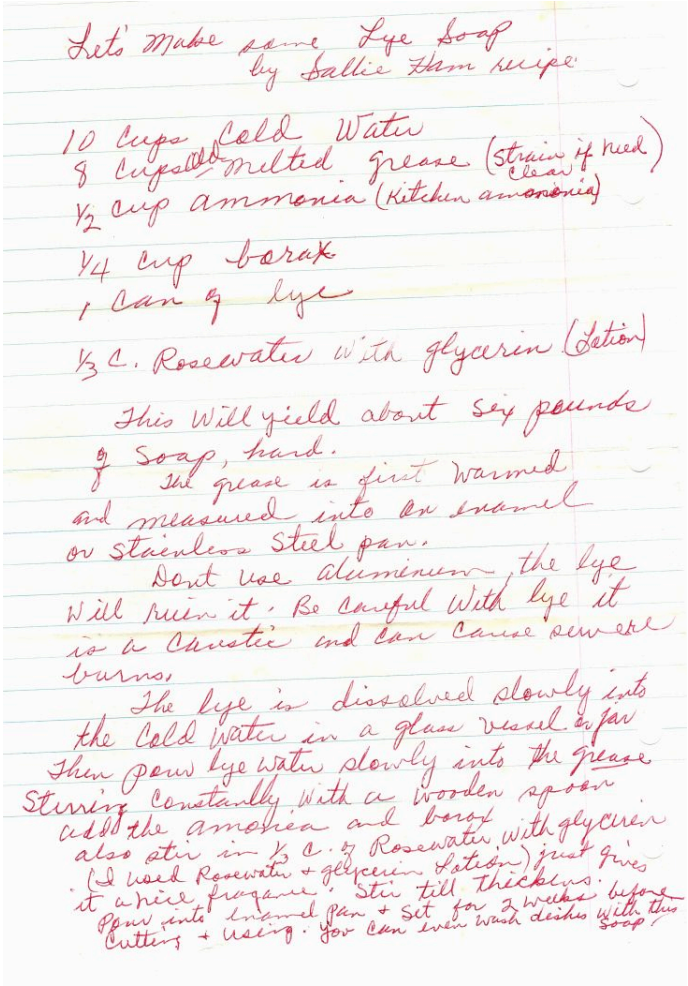
Preservatives

Depending on the oils used in the recipe, the resultant soap can be prone to spoilage. Various preservatives can be utilized, such as vitamins E, C, and A, which are also great for your skin. These vitamins can be found in various oils (see Table 1).

Other Additives

Sand or pumice can be added to the soap, to make it exfoliating. Also, some metals, such as titanium, silver, nickel, or aluminum can be added for antibacterial properties, and to make the soap bright white.

Deciding on a Recipe



Lets' Make some Lye Soap
by Sallie Ann recipe

10 Cups Cold Water
8 Cups Melted grease (Strain if need clean)
½ cup ammonia (Kitchen ammonia)
¼ cup borax
1 can of lye
⅓ C. Rosewater with glycerin (Lotion)

This Will yield about six pounds of Soap, hard.
The grease is first warmed and measured into an enamel or Stainless Steel pan.
Dont use aluminum, the lye Will ruin it. Be Careful With lye it is a Caustic and Can Cause severe burns.
The lye is dissolved slowly into the Cold Water in a glass vessel so far Then pour lye water slowly into the grease Stirring Constantly With a wooden spoon add the amonia and borax also stir in ⅓ C. of Rosewater with glycerin (I used Rosewater + glycerin Lotion) just gives it a nice fragrance. Stir till thickens before Pour into Enamel pan + Set for 2 weeks before Cutting + using. You Can even wash dishes With this Soap.

There are a variety of soap recipes available to choose from, and it is of course possible to create your own. The recipe you use will depend on the qualities you want your final product to possess; do you want a hard soap, or soft? Do you want a soap that will work well in cold or hard water? Are you making soap for sensitive skin? Some oils are more readily absorbed into the skin than others, and each oil that can be used for soap-making has different properties. A similar choice must be made when using lye; it comes in granular and flake forms, and different types of lye can be used for different soaps. For instance, sodium hydroxide lye is usually used for solid soap, whereas potassium hydroxide lye is commonly used for liquid soaps and shaving cream.

Whatever recipe you choose, or create, make sure that you measure the ingredients in correct proportions, and add them at the proper times. It is generally best to weigh the lye and oils using a kitchen scale, instead of measuring them with measuring spoons or cups, because different materials have different densities, and volume measurements can be inaccurate. Also, it is important to use a lye calculator to determine the amount of lye needed for your recipe. Using the calculator, you can adjust the amount of lye you want to use based on the amount of fat you want leftover in your soap. The lye will only saponify a certain amount of oil, so to have more oils leftover, use less lye, or vice versa. Soap with an excess fat level above 5% will moisturize skin better, and make it feel softer, than one with less than 5%; however, some people might feel that the soap with 5% or more excess fat level leaves their skin feeling greasy. An important consideration when calculating the amount of lye to use is, of course, skin type; when making soap for dry skin, you would want the excess fat level to be closer to 5%, but if the soap is being made for individuals with greasy skin, less than 5% will produce a cleaner feeling.

Equipment

Do not use any equipment made of copper, aluminum, cast iron, or zinc – the lye mixture will react with them. Use only glass, stainless steel, plastic, stoneware, or enameled cookware.

- Rubber or latex dishwashing gloves.
- Safety goggles.
- Apron.
- Long-sleeved shirt, long pants, and shoes.
- Large stainless steel mixing bowl, large enough to accommodate all of the ingredients without overflow or splatter.
- Two large plastic pitchers, one for lye and one for water. These should be labeled clearly, and utilized only when making soap.
- Two sturdy plastic spoons (preferably slotted), for stirring.
- Large heat-resistant container, to mix the lye and water. This container should be clearly labeled and utilized only when making soap.
- A large glass bowl or plastic pitcher, to hold the base oils after measuring, and before they are added to the lye mixture.

- Measuring cups or spoons, to measure essential oils and other additives.
- Ladle, for taking a bit of the soap mixture to blend with the additives.
- Miscellaneous bowls and spoons, to hold additives after they are measured, and before they are added to mixture.
- Tablecloth, newspaper or trash bags to cover your work area, and make it easier to clean up spills.
- Stainless steel or enameled pot for heating the base oils.
- Two glass or stainless steel thermometers – one for the lye and water mixture, and one for the oils. Candy or meat thermometers work well.
- Vinegar, to neutralize lye spills.
- Soap molds – can be almost anything you like.
- Pot holders/oven mitts.
- Plastic spatulas.
- Digital scale, accurate to 1 gram, or 0.1 ounces. The accuracy of the scale is important, because it will be used to measure all of your ingredients, including liquids.
- Old blankets/towels, for insulating the molds during cooling.
- Wax paper, or butcher's paper, for lining molds.
- Stick blender – optional, but makes stirring faster and easier.
- Paper towels or rags to clean up spills.

Make sure you have all of your equipment assembled, and ready to go, before beginning the soap-making process. Pausing during the process to run to the store won't be an option, as you will ruin a batch of batter by doing so; a big part of the soap-making process is good timing, and saponification will continue with or without you being there. Also, when you are finished making your soap, be sure to clean your materials and work area thoroughly. The soap should always be made in an area with good ventilation; if you are concerned about the ventilation of your work space, or if at any time you feel dizzy, light-headed, or have a sore throat, get some fresh air immediately. The best place to make soap is outdoors – ventilation is not a concern, and cleanup is much easier. Always, always keep children and pets away from your soap-making materials and equipment.

Precautions for Working with Lye

There are some precautions that must be taken when working with lye. After opening the lye, make sure that the lid is tightly closed. Lye has deliquescent properties, meaning that it has a tendency to melt or dissolve when it comes into contact with open air; it is also hygroscopic, meaning that it will absorb moisture from the air, and will form lumps in the powder. Either of these tendencies can render the lye unusable if it comes into contact with open air for long, so the container in which it is stored must always be sealed.

Lye is also dangerous if spilled. Use protective equipment and clothing, to prevent skin burning or irritation from a lye spill. Be sure to keep the lye away from children and pets – it can be fatal if swallowed. Work in a well-ventilated area, as lye releases toxic fumes when mixed with water; mix outdoors, or wear a protective respiratory mask, if possible. Vinegar can help to neutralize the lye mixture if it spills, so keep a bottle close at hand while working with lye. If the lye spills on any surface – skin, furniture, etc. – wash the affected area with vinegar, then soap and water, and rinse it clean.

Be sure to purchase lye that is labeled for soap-making. There are other lye products that are similarly packaged, such as food-grade lye, or 100% lye drain opener. The food-grade lye is not strong enough to make soap with, and the lye drain opener is, of course, much too harsh, and contains many other chemicals which you would not want on your skin.

There are some materials which should never come into contact with lye. Do not use any container, or heating vessel, made of aluminum, brass, bronze, chromium, iron, magnesium, zinc, or anything coated with Teflon. If the lye comes into contact with any of these materials, it will react with them to produce hydrogen gas, which is extremely flammable, and explosive. Also, the lye should never come into contact with sugar; this mixture will produce poisonous carbon monoxide gas. Materials that are suitable for contact with lye, at room temperature, are: high-density polyethylene (HDPE), polypropylene (PP), polyvinyl chloride (PVC), silicon rubber, stainless steel, glass, and porcelain. Stainless steel is the best material for heating vessels, as it can withstand elevated temperatures. Plastics may soften at higher temperatures, so unless the plastic has already been tested, glass or stainless steel are the best materials for mixing containers.

Because lye is a corrosive material, any amount of it that you order or purchase will most likely come with a material safety data sheet, or MSDS. This sheet will list:

- Manufacturer or vendor information
- Chemical composition
- Hazards and potential health effects
- First aid measures
- Fire fighting measures
- Spill measures
- Handling and storage
- Exposure and protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Environmental information
- Disposal considerations
- Transportation information
- Regulatory information

Before handling the lye, be sure to review the MSDS, so that you know how to handle it, what precautions to take, and what to do in case of an emergency.

The Cold-Process Soap-Making Method

This method is favored most commonly by those who make soap by hand. With the cold-process method, the soap is made from scratch. While it takes longer than other methods, you have complete control over the quality of the ingredients that go into your soap, and it is easier for beginners than the warm- or hot-process methods. The cold-process method is so named because after the lye, water and fat are mixed, no additional heat is added to the batter.

Step 1: Don protective equipment

For making soap, it is a good idea to wear a long-sleeved shirt, long pants, goggles, an apron, shoes, and gloves. Lye will irritate and burn skin, and the oils will ruin clothing and make your skin feel greasy; also, if you are using additives, certain essential oils can irritate your skin in large quantities. Protect your work area with a trash bag, or newspaper, to make cleanup easier.

Step 2: Prepare molds

Determine which molds you want to use; almost anything can be utilized as a mold, and the soap you make can look as plain or as decorated as the mold you use. Candy or gelatin molds will make intricately designed soaps, but even a cardboard tube or PVC pipe will suffice (the soap can be removed in a cylinder and sliced into bars). Cardboard milk and juice containers are great for making plain, square soap, because they are coated with wax, and the solidified soap can be easily removed. If you want to use an untreated cardboard or wooden box, the soap can be cut into squares when it is removed. Line the mold with wax paper, so that the soap can be easily removed after it has set. (If you are using a non-porous material, such as glass or plastic, you may be able to simply grease the mold with cooking spray, and avoid the lining procedure, if you like.) Make sure that you have enough molds prepared to accommodate all of the soap mix – you don't want to be scavenging for more molds while the soap is beginning to set in the kettle.

Step 3: Measure your ingredients

To accurately measure the fat and lye amounts you'll need, look up the saponification value of the fats being used in the soap. The saponification value of a fat is the amount of lye required to saponify a given amount of that type of fat or oil. In the cold-process method, measurements must be exact in order to ensure full neutralization of the lye and fats. This step is vitally important. Incorrect measurements will result in excess lye, which can cause burning and irritation of the skin, or excess fats, which will leave skin feeling greasy. Often, soap makers will use a formulation that allows for some excess fat, but that depends on the preferences of the soap-maker, and the type of skin for which the soap is intended.

Each fat or oil has its own unique saponification value, so always check before measuring your lye. The saponification value given can also differ for different types of lye (sodium hydroxide, or potassium hydroxide), so it is important to know which type of lye is being referenced with this value.

Measure oils and water using a measuring cup, placed on the digital scale. The scale should also be used to measure the lye powder. (Don't forget to "zero" the scale – measure the container's weight first, and then set that weight as zero. This way you

won't have to make any calculations to deduct the container's weight, or accidentally include the weight of the container in your measurements.)

Step 4: Prepare the Lye Mixture

Dissolve the measured amount in cold (preferably refrigerated) water. Pour the lye into the water, a little bit at a time, and stirring constantly. Always add the lye to the water, never the other way around. If water is poured onto lye, it will form a crust on the surface; the lye underneath will continue to react as more water is added, and eventually, so much pressure will build up that the lye underneath will erupt through the crust, spraying lye powder, hot steam, and fumes everywhere.

As the lye is added to the water, the water will become very hot; when lye mixes with water, it creates an exothermic reaction, meaning that the chemical reaction between lye and water releases a lot of heat during the process. (Dissolving the lye will also release fumes, which appear as a mist or vapor; these fumes contain molecules of lye, and must not be inhaled.) Use a thermometer to monitor the temperature of the solution while mixing; it should not exceed 190°F. If the mixture gets any hotter, it may begin to boil over. If the lye mixture is getting too hot, try submerging the container in a larger container of ice water. As a preventative measure, if you are going to be mixing a large quantity of lye, use refrigerated or ice water to mix the lye solution. Continue stirring until the mixture is clear, and all of the lye has been

completely dissolved. Once all of the lye has been dissolved in the water, allow the water to sit and cool until it is 100-110°F.

Step 5: Heat the fats

As the lye mixture is cooling, the fats must be heated. Be very careful while heating the oils; each oil has a flash point – a temperature at which it will ignite – and some are lower than others, so the oils must be heated very gently. Use a stainless-steel pot on low-heat, and stir often. If using a microwave to heat the oils, heat the oils in a microwave-safe container. Heat on high power for one minute, and then continue to microwave in 20-second increments, testing with a thermometer each time. If the fats used are liquid, then they must be heated to approximately 100-110°F, to match the temperature of the lye mixture. If the fats are saturated enough they will be solid at room temperature, so they will have to be melted; this will most likely mean heating the fats past 110°F, then allowing them to cool to the proper temperature. (Regardless of which method you use to heat the oils, check the lye mixture's temperature as you go; this way you can determine whether the fats need to be heated more, to match the lye mixture.) When measuring the temperature of the mixtures, be sure to keep the thermometer floating somewhere in the middle of the mixture; if the thermometer is placed on the bottom of the container, it will give you an inaccurate reading.

Step 6: Mix the fat and lye

Once both the fat and lye mixtures are at 100-110°F, they can be combined. Pour the lye mixture into the fat, slowly and steadily, stirring it in small, rapid circles as you pour.

Step 7: Stir

After the ingredients are combined, they must be stirred. If stirring by hand, the mixture must be stirred for 5 minutes, and then allowed to set for 15. This pattern is repeated for up to 3 hours; the amount of stirring required will vary based upon the recipe. A stick blender is more convenient, and speeds up the process substantially; the mixture will only need to be blended for about 30 minutes, instead of being stirred for 3 hours. Use caution with a stick blender, however. If the mixture is stirred too long, it may have air bubbles in it. Also, the stick blender stirs the mixture

so quickly that by the time the mixture is fully stirred, it is still raw, and may not have reached trace yet. If that happens, stir occasionally, by hand, until it starts to trace.

Step 8: Trace stage

Trace refers to the viscosity of the mixture as it is stirred; the term "trace" originated from a method of testing the soap mixture. Take a spoonful and drizzle it across the top of the mixture; if it remains visible, or leaves a trace, for a few seconds before blending back into the mix, then the mixture has begun to trace. Light trace refers to mixture that has just begun to thicken, whereas medium trace and heavy trace refer to a mixture that is thicker and more difficult to stir. (Some recipes will take longer to trace than others; humidity and temperature also affect tracing times. If the mixture doesn't trace as quickly as it should, don't worry; keep stirring, and it will eventually.) Most additives, such as superfatting oils, herbs or colorants, will be added at the trace stage; once the soap mixture has reached this stage, the lye and fats are about 80-90% saponified, meaning that anything added to the mixture will not be significantly affected by the saponification process. Depending on the ingredients, they may be added at light, medium, or heavy trace. Measure out the essential oils, colorants, or any other additives you plan to use in a separate bowl. Mix a spoonful of the soap mixture with the additives. When it is well-blended, add it to the soap mix, stirring slowly and steadily as you pour.

Step 9: Pour into molds

At the end of the trace stage, the soap mixture is poured into the molds, and allowed to set for 18-48 hours; saponification takes place during this period of time. If the soap becomes too solid to stir, or pour easily, it has reached the point of seize; saponification has progressed so far that the soap has begun to solidify. The soap must be poured into the molds before it reaches this stage; if you notice the soap getting increasingly hard to stir, it must be poured into the molds as quickly as possible.

Step 10: Insulate the molds, and allow to set

The molds should be wrapped in towels or blankets, to retain as much of the mixture's heat as possible. If the soap turns transparent during the molding stage, it means that the soap mixture has overheated in the mold. If this happens, unwrap the molds, and put them someplace a bit cooler. The soap should return to its normal opacity. The soap may have lost its scent, due to the essential oils or other additives having been "cooked" by the soap's high temperature; it may also have a hard rind, but this should only be noticeable if the soap is cut. Other than these flaws, the soap is still perfectly usable.

If you notice your soap developing a light coating of white powder while in the mold, it means that the soap is reacting with the air. To avoid this problem, seal the soap while it is in the mold. The white powder will be highly acidic, and irritating to

the skin, so it must be rinsed or trimmed from the soap. If the mold is airtight, this problem should not occur; however, monitor the soap closely, as sealing it off from the air may also cause it to overheat.

After being poured into the mold, the soap should turn slightly darker in the middle, continue to get hotter, and have some bubbles rising to the surface. This is an indication that proper saponification is taking place. Once the neutralization process begins to slow, the soap should return to a normal, uniform color. If the soap is poured into a mold that is too small, or is not insulated properly (or if it cooled too much during tracing) you may not see these signs of neutralization taking place, and caution should be used with the soap, as it may be greasy, or have an excess of lye.

If you notice, within the first 24 hours of the molding stage, that the mold is no longer warm to the touch, or the soap fails to harden, there may be a problem with the mixture. If your measurements were off, then the saponification process may have failed. If you're sure that the measurements were correct, then pour the soap into a pot and heat it on the stove, until it reaches approximately 130°F. Then pour it back into the molds. If the soap still doesn't solidify normally, then you may have to discard the batch.

Step 11: Remove the soap from the molds

Once the one- to two-day molding process is completed, the soap is firm enough to be removed from the mold and cut. Be sure to use gloves when you remove the

soap from the mold, because the lye may still burn your skin. If you lined the mold with cellophane or wax paper, it should be fairly easy to get the soap to release; if not, try putting the mold in the freezer for a while. The cold will cause the soap to contract, and it can be removed much more easily, but if you used colorant in the soap, it may fade a bit.

Step 12: Curing the soap

After they are removed from the mold, the bars should be placed on wax paper, and left in a cool, dry place for 2 to 6 weeks, to cure and harden. The actual curing time required will depend upon the recipe, because the initial water content of the mixture will vary depending upon the ingredients used.

Step 13: Test the pH of your soap

Before using your soap, test a bar for pH level. This is an important step; even veteran soap-makers test their soap before using it, because mistakes are always possible, and a single batch with a lye content that is too high can have dire consequences (chemical burns, etc.). You can test the pH of the soap using a chemical called phenolphthalein; this chemical turns fuchsia, or pink, if the pH is too high. Un-reacted lye is a very alkaline substance, meaning that it has a pH of 14; water has a pH of 7, and most of the oils you will use have a pH of 0-2. The pH of soap that will be used on skin should be between 7 and 9.5; if the drop of

phenolphthalein stays clear, or very pale pink, then the soap is safe to be used on skin. If it turns a deep pink, the soap should not be used on skin, but is safe to use for household cleaning, dishes, or laundry.

You can also test the pH of your soap using a pH test strip, such as the ones commonly used for aquarium water. Mix one gram of the soap with 100ml of room-temperature water – the water should be just enough to dissolve the soap in, because if there is too much water it will give a false pH reading. (Also, test the pH of the water beforehand, and make sure that it is a neutral 7.) Use the strip to test the solution, following the directions on the strip.

There is a third method to test for lye content, if you don't have the materials available for the other tests. Touch your tongue to the bar of soap, or touch the bar with a wet fingertip and touch the fingertip to your tongue. If your tongue tingles, or you experience a pinching or burning sensation, then there is still too much un-reacted lye in the soap. This test can be somewhat dangerous; your tongue can get burned if the lye content of the soap is very high. Also, you won't be able to get more than a very general idea of how much lye is in the soap, so this test isn't highly recommended.

STEP 14: STORING YOUR SOAP

If your soap is satisfactory, and you want to keep it, be sure to store it in a cool, dry place, out of direct sunlight. Label each bar clearly with the batch code, so that you will be able to quickly reference what is in each bar, when it was made, etc. Your memory is good now, but after a few months go by, and you have made several batches, it may become difficult to distinguish one bar from another.

Other Soap-Making Methods

The basic process for making bars of solid soap is similar for each technique, but there are variations depending on the method used by the soap-maker. In all processes, the oil or fat is heated; saturated fats are heated much more than unsaturated, because they must be melted before being allowed to cool. Lye and water are mixed to achieve the desired consistency, and then the ingredients are mixed together. The mixture then has to be stirred. The mixture is poured into a mold, and allowed to set, typically for 24-48 hours. The bars continue to harden for another 3 to 8 weeks, depending on the ingredients used.

Melt-and-Pour Method

This method involves taking pure glycerin (animal or vegetable derived), which is always in liquid form, and solidifying it by adding other chemicals. The lather is created by adding pure detergents. Natural ingredients may be added to this variety of soap, but the glycerin base is synthetic, and this method can be expensive, as you are making soap from a by-product of other soap. "Melt-and-pour" can also refer to a different process – melting commercial or pre-made bars of soap, adding your own fragrance and other additives, and creating new bars from the mixture. Of course, this method can also be expensive, and you lose a degree of control over the

materials used, and the quality of the soap; however, it is quicker, more convenient, and somewhat safer than making soap from scratch. Also, there is no need to wait weeks for the soap to cure; the bars are ready to use as soon as they cool and harden. Bars of fragrance- and dye-free soap base can be purchased from many craft and soap supply stores. (You could also try to find some variety of unscented, additive-free soap in a grocery or health-and-beauty store.) The bars are melted in a microwave or double-boiler; if melting in a microwave, use 1 cup of grated soap to ¼ cup water. Microwave, using medium heat and stirring regularly, until the soap is completely melted and the water has evaporated. Once the soap is melted, you can add your own additives. The mixture only needs to be stirred until it is well-blended; there is no trace stage, since the soap was already saponified before you purchased it. Once the additives are blended with the soap, it can be poured into molds. Once it has cooled and hardened, it is ready for use.

Rebatching

Rebatching refers to the process of melting soap scraps, or chunks of soap base, and remolding them. Rebatching is useful if you have soaps that are warped, or otherwise aesthetically flawed, but still usable; it also helps to extract the full medicinal or beautifying benefits from any herbs you have added to soap. The fresher the soap is, the better, because the longer it cures, the less moisture it contains, and the harder it is to melt. As with the melt-and-pour method, as soon as the soap hardens and cools, it is ready to use.

To rebatch soap, cut the soap you intend to melt into small chunks, or use a cheese grater. Mix the soap chunks or gratings with milk or water; the general rule is to use one cup of milk or water for every pound of soap. For soap that is made with olive oil, or animal fat, use ½ cup of milk or water. (For soap that has cured for one week or less, use half of the above measurements.) Cover the pot, and let the soap soften in the milk or water for 1-2 hours, stirring it approximately every 30 minutes.

If melting the soap in the oven, mix it with the milk or water in a stainless steel, enameled or glass pot. Put your oven on its lowest setting – make sure it is no higher than 170°F. Put the soap in the oven, and stir it every 15 minutes. The soap should take approximately one hour to melt. If using the crock-pot method, set the crock-pot to low, and stir at the same intervals. The soap should take about the same amount of time to melt, or maybe a little longer.

Once the soap is melted, add your desired essential oils, colorants, herbs, or superfatting oils. Mix the batter thoroughly; you may want to utilize a hand blender, or stick blender, to mix the batter smoothly and quickly. After mixing, pour the batter into molds, and allow it to set for 24-48 hours. When the soap is removed from the molds, cut it into bars. The soap is safe to use as soon as it is cut, but it is best to allow the soap to cure for about a week before using it.

Semi-Boiled, or Hot-Process, Method

The hot-process method differs from cold-process in that external heat is applied after the fats and oils are mixed together. Instead of allowing saponification to take place during the molding stage – which takes a long time – saponification takes place before the soap is molded. The hot-process method was commonly used when the purity of the lye soap-makers were able to obtain was in question. Also, if you want to use a natural lye solution, such as potash, instead of 100% lye, hot-process is the best method to employ. This is because the hot-process method requires less exact measurements than the cold-process method, because saponification is "forced" instead of taking place on its own. Therefore, it is unnecessary to know the exact concentration of lye in the mixture, so less than pure lye can be used.

In the hot-process method, the mixture is heated over a double-boiler, or in a crock-pot, during the trace stage, and the soap is, quite literally, "cooked" to achieve more rapid neutralization. The crock-pot method is the easiest because the temperature is easily regulated, and the soap is less likely to burn. The amount of soap you can make will vary based on the size of your crock-pot, but ideally, you want the crock-pot to be about half full. Any less, and the soap may burn; any more, and it may boil over if the temperature is too high. The ideal temperature will vary based on the oils you use, and by each individual crock-pot. Just like stoves, some operate at a higher temperature than others. If you are unsure of the temperature at which your crock-pot operates, use a meat thermometer to test the mixture. It should be between 176-212°F, or just below boiling. The soap should be completely saponified in 15-20 minutes. For experienced soap-makers, it is possible to tell when saponification has completed by tasting the soap (it shouldn't make your tongue tingle, or burn), or by determining visually when the soap has reached a gel texture, characteristic of complete saponification. It is also possible to determine whether saponification has completed by testing the pH of the soap.

Unlike cold-process soap, hot-process soap can be used immediately after it has cooled and hardened, because it should be completely neutralized already; therefore, there is no curing time necessary. However, it is still a good idea to cure the soap, instead of using it right away, because the soap may still be soft or spongy, and may not lather properly, or last as long.

Warm-Process (or Oven Hot-Process) Method

The warm-process method is, as you may guess, somewhere between the cold-process and hot-process methods. Instead of insulating the soap with blankets while it is in the molding stage, or boiling it to achieve faster saponification, the filled soap molds are heated in an oven.

To begin oven hot-process (OHP) soap, you can use any hot- or cold-process soap recipe. Turn your oven to its lowest possible setting – no more than 170°F. As with cold-process soap, mix the lye and water, heat the fats, and combine when they are at approximately the same temperature. Stir the batter until it achieves a medium to thick trace. Be sure to use a large pot, such as a stainless-steel stockpot, so that the soap mix doesn't boil over in the oven. If it does, it's messy, but not a huge problem; the soap will smoke and smell bad, but it shouldn't catch fire. Take out the soap, clean up the mess, and continue cooking it. (The pause in cooking will not cause any problems with the soap, for this method.)

At this point, place the mixture in the oven, and "cook" it at 160°F for approximately 10 to 20 minutes. (The exact cook time will vary, depending on your batch size, and oven.) Turn off the heat, and leave the pot in the oven, with the door closed, for approximately one hour. After this time has passed, test the soap's pH to see if it has completely saponified. If not, put the soap back in the oven for 15 minutes, and test again. If it is ready, add your essential oils or other additives, stir the batter thoroughly, and pour it into the molds. Once the mold has cooled, the soap can be removed and cut. Though it is completely saponified at this point, the bars still need to cure and harden for 2-3 days before use, as with hot-process or rebatched soap.

Full-Boiled Method

This method is typically favored by commercial soap-makers. All ingredients are added at once, in a large container, and heated to cause saponification. Glycerin is a by-product created via this method. The glycerin is typically removed by commercial soap-makers, and sold; however, your soap, with the glycerin still in it, will be naturally more moisturizing and skin-conditioning than commercial bars.

Transparent Method

Alcohol is added to the other ingredients to prevent crystallization while it cools and solidifies. This produces a clear soap, and lots of creative projects can be made with this variety of soap. It's great for innovative and adorable gifts. Transparent soap is sometimes called glycerin soap, but this is a misnomer, since glycerin isn't utilized at all during this process. One downside to transparent soap is that, because of the alcohol added to the mixture, it can be somewhat drying for some skin types.

Making Liquid Soap

When making liquid soap, different ingredients are required than those you would use for solid soap. There are two processes for making good liquid soap. One process is quite similar to the cold-process method for making solid bars; however, instead of curing your soap after removing it from the molds, it should be cut up into small pieces, or grated. Making liquid soap is easier if the solid bars are made from an oil that results in a softer soap, such as canola oil. (See Table 1.) Also, try using potassium hydroxide lye for liquid soap, instead of sodium hydroxide; it makes softer bars, so the process of making liquid soap from the bars is easier. The pieces can then be melted with water in a double-boiler; the ratio should be one cup of soap to three cups of water. Heat on medium, and stir regularly until soap is melted. (If there are chunks that won't melt, simply remove them from the mixture.) If the melted soap is too viscous, add more water until the mixture achieves the desired consistency.

The other way to make liquid soap is to make it via the hot-process method. Mix the oils and lye as you would for cold-process soap; it may take a very long time to

trace, so be patient. When it does trace, it may be a little thinner than regular cold-process soap. Cook it in a crock-pot, or over a double-boiler, for 3 to 4 hours, stirring every half hour. It will go through many stages; at its final stage, it will be translucent and creamy. To check and see if the soap has cooked long enough, mix one ounce of the soap with two ounces of boiling water. If the mixture is milky, or very cloudy, once the soap has dissolved, it needs to cook longer. (If cooking the soap longer doesn't make it clearer, one of the ingredients may have been measured incorrectly.) If it is clear, or only slightly cloudy, then the soap should be ready.

Liquid soap can be prone to spoilage, so glycerin or another oil containing vitamin A, C or E should be added to help preserve it. Store your liquid soap in a pump, or flip-top bottle, to further guard against spoilage. Use the soap within 6 to 8 months, and dispose of it if it becomes cloudy, or smells rancid.

Stick Blenders vs. Hand Stirring

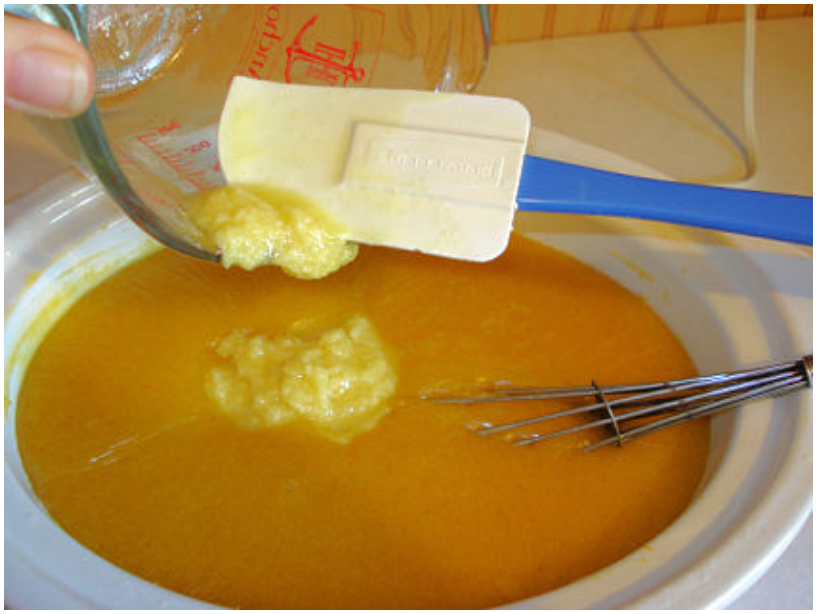
Anyone who has hand-stirred soap knows that it is a long and arduous process. Stick blenders can speed up the mixing process significantly. Soap that is mixed with a stick blender is likely to reach trace much more quickly, is less prone to separation, and can usually be cut and shaped without breaking or crumbling, once it has been removed from the mold.

If you are just starting out in the hobby of soap-making, you may want to use a spoon or hand-mixer to blend the batter, until you are able to tell the difference between the various stages of trace. Otherwise, you may run the risk of having the batter seize in the blender, because saponification was allowed to progress too quickly. Also, you may want to use a spoon to blend in your essential oils or colorants, but if you are having trouble with clumping, the stick blender is a great way to get them to blend smoothly.

If you have difficulty with the stick blender mixing air bubbles in with your soap, try using a taller, narrower container, as opposed to a shallower, wider one. This allows the stick blender to stay near the bottom of the batter, and not pull as much air into the mixture. Also, if the batter is reaching trace too quickly, try starting at a lower temperature - 90-100°F, instead of the standard 100-110°F. The lye doesn't need to be poured into the fats as slowly with a stick blender as if you are hand-

stirring, and if you take too long doing so the soap may be approaching trace by the time you're done pouring. So, with a stick blender, pour the lye into the fat quickly, while the blender is already running.

Superfatting



For those with sensitive or dry skin, a process known as superfatting can result in an even more luxurious and moisturizing soap. Superfatted soap contains, as it sounds, more fat than other soaps, which makes it less harsh on skin; however, if too much fat is used, it can leave users with a greasy feel to their skin after it is rinsed away. Superfatting can be accomplished by, obviously, adding extra fat to the soap; this would take place during the trace stage, after saponification, so that the superfatting oils do not interact with the lye. Another superfatting process, known as superfat discounting, or lye discounting, accomplishes the same ratio of fats to lye, by adding the same amount of fat, but less lye. Superfatting by adding extra oil after saponification allows the soap-maker to have greater control over the amount of oils left in the soap. For example, if you use a mixture of 95% olive oil and 5% cocoa butter as your base, and calculate the lye for 5% excess fat level, the 5% leftover will be a mixture of olive oil and cocoa butter; it may be all olive oil, all cocoa butter, or any mixture in between. Therefore, if you want to use cocoa butter for superfatting, and you want to be assured that the leftover oil is all cocoa butter, your best bet is to use all olive oil, with a lye calculation for 1% excess fat level, and add the cocoa butter during the trace stage. This way you know that the final product contains 1% olive oil and 5% cocoa butter.

Adding the oil at the trace stage also keeps the oil in its natural state, unaffected by the lye and providing instant nourishment to the skin when used. When adding oil during the trace stage, use an amount of lye calculated to yield 1% excess fat; otherwise, the soap will be too oily, because in addition to the oil you add it will have excess fat from the depleted amount of lye during saponification. Also, when calculating the amount of lye needed, be sure not to include the oil you plan to add during trace.

Batch Codes

After you complete a batch of soap, it is a good idea to include a batch code with the soap's packaging. The batch code is a numeric (or alphanumeric) code that enables the soap-maker to identify which batch of soap each bar originated from. This is important because if you find a bar that is flawed, or if you receive a complaint about your soap, you will be able to quickly identify all of the bars in that batch, so that you can dispose of all of them. The batch code should also be linked to a record that indicates:

- The name of the manufacturing company
- The name of the soap-maker
- What ingredients were used
- The amount of each ingredient
- Variations, if any, from your usual soap-making procedure
- Manufacturers and lot numbers of the ingredients used
- The soap's expiration date
- The date the soap was made
- Curing time
- What method was used to make the soap (i.e., cold-process method)
- The temperature at which the soap was mixed

- Any information that might be necessary in the case of a customer question or complain, or to help you identify the reason for a problem in a given batch.

Types of Soap-Making Oils

There are a variety of oils that can be used in the soap-making process. Each oil has different properties, making the saponification process a bit different for each, and resulting in different qualities in the soap produced. Each oil must also be used in a slightly different quantity. Oils indicated for use at the trace stage are superfatting oils, and should not be taken into consideration when calculating lye content for your recipe.

Table 1

Oil	Properties	Amount Used	When Added
Aloe Vera Liquid/ Gel	Soothing and healing	Up to 10% in addition to base	Trace
Apricot Kernel Oil	Good moisturizer; helps soften skin	1-2 ounces per pound of fats	Trace
Avocado Oil	Preservative/antioxidant; great moisturizer; contains vitamins A, B, D, E, and lecithin; good for baby soap, and beneficial for dry or wrinkled skin	Up to 30% of base	Base oil
Beeswax	Makes a harder bar of soap; contains a high percentage of unsaponifiables; skin protectant, often used in lip balms and hand salve	1 ounce per pound of soap	Base oil
Calendula Oil	Heals a variety of skin damage	1 2/3 tablespoons per 5 pounds of soap at trace, or up to 20% as base	Trace/base oil
Canola Oil	Less saturated, can be slow to saponify; needs to be mixed with other saturated fats/oils; can be used in place of more expensive oils	Up to 50% of base	Base oil

Carrot Oil	Preservative; contains vitamin A	Up to 10% of base	Base oil
Castor Oil	Moisturizing; produces a hard soap	Up to 30% of base	Base oil
Cocoa Butter	Makes soap harder; excellent skin softener and lubricant; has a natural chocolate scent	1 ounce per pound of fats at trace, or 15% of base	Trace/base oil
Coconut Oil	Makes great lather, but can be drying to skin if too high a percentage of base oils; will make a very hard white soap; saturated fat	20-30% of base	Base oil
Cottonseed Oil	Produces think and lasting lather; has emollient properties; can be vulnerable to spoilage depending on the season	Up to 25% of base	Base oil
Emu Oil	Helps draw other oils into the skin, increasing their efficacy	1 ounce per pound of soap	Trace
Evening Primrose Oil	Helps skin defend against infection or inflammation; not recommended for oily complexions	2 tablespoons per 5 pounds of soap	Trace
Grapefruit Seed Oil	Preservative; antioxidant; contains vitamin C	Up to 10% of base	Base oil
Hazelnut Oil	Moisturizing; highly unsaturated	Up to 20% of base	Base oil
Hemp Oil	Often used in lotions; excellent moisturizer	2 tablespoons per pound of fats	Trace
Honey	Not an oil, but an additive; helps retain moisture on skin's surface	2 tablespoons per pound of fats	Trace
Jojoba Oil	Often used in shampoos; moisturizing; has antibacterial properties	2 tablespoons per pound of fats	Trace
Kukui Nut Oil	Quickly absorbed by skin; great for moisturizing after sun exposure; offers relief for eczema, psoriasis, and acne	2 tablespoons per 5 pounds of fats, added at trace; or, 10-20% of base	Trace/base oil

Lard	Made from pig fat; cheap, easily obtainable; makes a white, lathery bar of soap; without other oils, can be soft and not work well in cold water	Up to 70% of base	Base oil
Macadamia Oil	Slightly expensive; long shelf life; great skin conditioner	1 ounce per pound of soap	Trace
Mango Butter	Great moisturizer	5% added at trace; or, up to 15% of base	Trace/base oil
Monoi/Monoi de Tahiti Oil	Made from coconuts; can be expensive; great moisturizer	Up to 60% of base	Base oil
Neem Oil	Can treat a variety of skin disorders, such as dandruff	Up to 40% of base	Base oil
Olive Oil	Excellent base oil; avoid extra virgin, the lower the grade the better; moisturizes and softens skin; very mild	Up to 100% of base	Base oil
Palm Kernel Oil	Has most of the same qualities as palm oil; lathers well, makes a hard soap	20-30% of base	Base oil
Palm Oil (Vegetable Tallow)	Makes hard soap; mild; good substitute for tallow in all-vegetable soaps; soothes and moisturizes dry skin	20-30% of base	Base oil
Peanut Oil	Preservative; long-lasting lather; highly unsaturated, prone to spoilage; contains vitamin E	Up to 20% of base	Base oil
Safflower Oil	Unsaturated oil; moisturizing	20-60% of base	Base oil

Sesame Seed Oil	Said to be good for psoriasis, eczema, rheumatism, and arthritis; moisturizing; strong nutty scent; makes a soft bar unless used in conjunction with other, more saturated oils	Up to 10% in addition to base	Base oil
Shea Butter	Lots of substances that don't interact with lye, and stay in soap to nourish skin	1 2/3 tablespoons per 5 pounds of fats, added at trace, or up to 20% of base	Trace/base oil
Soybean Oil/ Vegetable Shortening	Cheap, readily available; produces mild, stable lather; makes hard soap	Up to 50% of base	Base oil
Sunflower Oil	Preservative; less expensive alternative to olive oil; contains vitamin E; less saturated oil, must be mixed with more saturated oils; can make soap take longer to trace and harden	15-20% of base	Base oil
Sweet Almond Oil	Great moisturizer; makes a stable lather	1 ounce per pound of fats	Trace
Vitamin E Oil	Preservative; antioxidant; great for skin	Up to 10% in addition to base	Trace
Wheat Germ Oil	Preservative; thick, antioxidant; rich in vitamin E; nourishes dry skin; soothing for skin conditions such as psoriasis and eczema; prevents and reduces scarring and stretch marks; keep refrigerated	1 ounce per pound of fats	Trace

Properties of Fatty Acids

Each oil is composed of fatty acids, and each type of fatty acid has certain properties. Below is a list of terms that you may see, used to describe oils, or the fatty acids contained therein. Knowing what each term means can help you to determine which oils to use, based on the percentage of each type of fatty acid each one contains.

TABLE 2

Type of Fatty Acid	Properties	Examples of oils containing it
Lauric	Makes a hard bar, with rich lather	Coconut oil, palm kernel oil
Linoleic	Skin-conditioning	Grapeseed oil, hemp oil
Myristic	Makes a hard bar, with rich lather	Coconut oil, palm kernel oil, tallow
Oleic	Skin-conditioning	Hazelnut oil, olive oil, sweet almond oil
Palmitic	Makes a hard bar, with stable lather	Palm oil, tallow, cocoa butter
Ricinoleic	Skin-conditioning; makes rich, stable lather	Castor oil
Stearic	Makes a hard bar, with stable lather	Cocoa butter, mango butter, shea butter

Natural Colorants

If you don't want to use synthetic colorants to color your soap, there are a wide variety of natural colorants that you can use. Natural colorants are sometimes safer, but the reality is that most colorants are processed at some point; if you want to be sure that the colorants you are using are truly natural, do some research into the methods with which they were harvested and processed.

TABLE 3

Colorant	Resultant Color
Alfalfa	Medium green
Alkanet*	Deep purple to blue
Annatto Seed*	Yellow-orange
Beet Root	Pink to red
Calendula Petals	Yellow
Carrots	Yellow-orange
Chamomile	Yellow-beige
Chlorophyll	Green
Cinnamon***	Tan to brown
Cloves	Brown
Cochineal Powder	Deep red
Cocoa Powder	Brown
Coffee	Brown to black
Comfrey Root	Light, milky brown
Cucumber	Bright green
Curry Powder	Yellow
Elderberries**	Light brown
Henna	Olive green to brown
Indigo Root	Deep blue
Jojoba Beads	Many colors
Kaolin Clay	White
Kelp	Green
Madder Root	Red to purple
Milk	Tan to brown
Moroccan Red Clay	Brick red

Paprika***	Peach to salmon
Poppy Seeds	Blue-grey
Pumice	Grey
Pumpkin	Deep orange
Rattanjot	Deep red to purple
Rose Hip Seeds	Tan to brown
Rose Pink Clay	Brick red
Safflower Petals	Yellow to deep orange
Saffron	Yellow
Sage	Green
Spinach	Light green
Spirulina	Blue-green
Titanium Dioxide	Bright white
Turmeric	Gold to amber

*Steep in oil before adding to soap.

**Steep in lye solution before adding to soap.

***Can be irritating to some skin types.

Before you use any colorant in your soap, it is always a good idea to test it first. Testing the colorant will allow you to decide how much to use to achieve the right hue, and will prevent a batch of soap getting ruined by using the wrong amount, or an herb to which you have a skin sensitivity. Also, different colorants should be added at different stages of the soap-making process, so these important tests can give you an idea of when to add the colorant to your soap mixture.

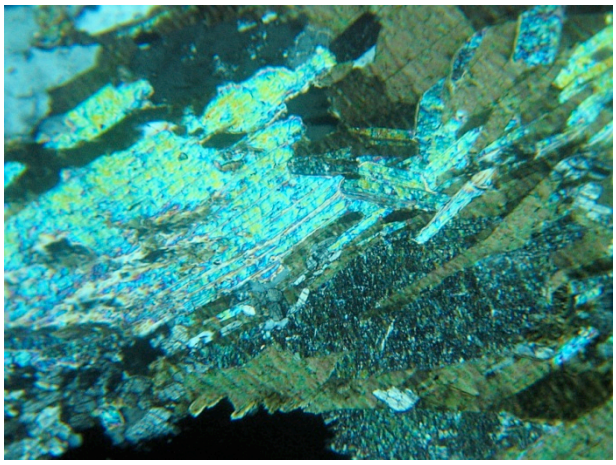
The first test you should perform is the lye test, to determine how the colorant you are using will react with the lye. Dissolve one tablespoon of lye in ½ cup of water. After the lye mixture has cooled, add a small amount of your colorant; ¼ teaspoon of powder, or a few leaves of a fresh or dried herb, should be sufficient. Take note of what happens to the mixture after a few minutes, an hour, and 24 hours.

If you like the results of the lye test, move on to the oil test. Heat up about 4 ounces of oil – be sure to use whatever oil you plan on using in your recipe, so that the results will be accurate. Add the colorant as you did with the lye mixture, and check the solution at the same intervals.

If you like the way the colorant reacted with both the lye and the oil, then it might be time to move on to testing the colorant in a small batch of soap. If the colorant reacted better with the lye, then add it to the lye-water mixture, before it is mixed with the oils. If the colorant reacted better with the oils, then add it to the base oils, or add it at trace. As always, take note of how much you used, when it was added, and what the results were; this way, you'll be able to duplicate the results, or make any necessary changes.

Other Soap-Coloring Options

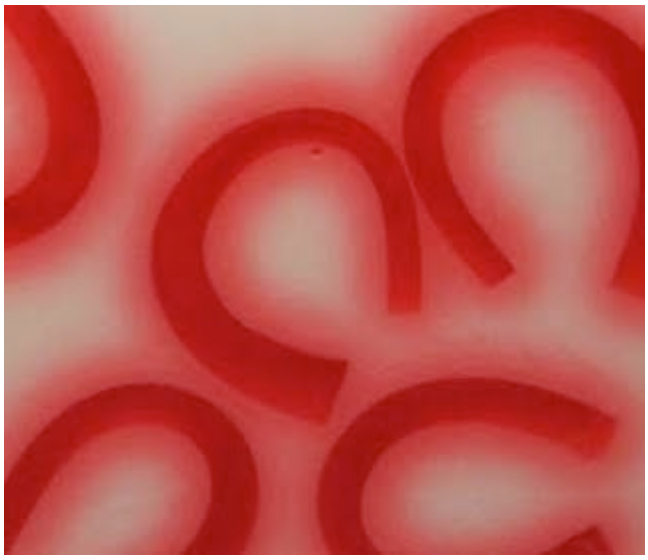
If the natural colorants don't work for you, or are too expensive or unpredictable, there are a variety of synthetic colorants that can be used. Pigments, micas, and FD&C colorants are some of these.



Pigments are colorants that were originally mined, but now, due to FDA regulations, are manufactured in laboratories. Many natural oxides contain toxic materials, so the FDA chose to approve only synthetic colorants for use in soaps and cosmetics. The synthetically made pigments have the same molecular structure as the natural ones, but they have a low enough concentration of toxic metals that they are considered "safe" by the FDA. Pigments tend to be pretty stable, and the color that they will impart to your soap is predictable. The liquids are extremely easy to use, but the powders must be mixed with liquid before they are added to the soap batter, and they may clump. The easiest way to liquefy the colorant powder is to put a tiny bit of rubbing alcohol into a bowl – ¼ teaspoon is probably enough – and then add some powder. Mix until all of the powder has dissolved in the alcohol. Mix the solution into the soap batter at the correct stage; if the batter is not your desired hue, mix more colorant solution. Another method of mixing the powdered colorant is to combine it with liquid glycerin, in a ratio of 2 parts glycerin to 1 part colorant powder. (The advantage of the liquid colorants is that this process is unnecessary; the colorant can be added, one drop at a time, until the soap has achieved the desired hue.)

FD&C colorants are also manufactured in a laboratory. By way of comparison, they are easier to use than many pigments, and provide a much wider range of colors. There is some debate over the safety of FD&C colorants, because in the past, the FDA has recalled some of these colorants due to safety concerns. However, this fear is, most likely, unfounded. FD&C colorants are in almost all of the processed foods we eat, so the miniscule amount that is in soap is not really cause for concern. FD&C colorants are inexpensive, and very easy to use; they are great for use in melt-and-pour soap, but they don't usually remain stable in cold-process soap, due to its high alkalinity.

Micas are a combination of natural and synthetic materials. The micas themselves are natural material; after they are mined, they are then coated with FD&C colorants, or pigments, to provide them with color. Shimmery micas are normally used to give color to makeup, but can be used for soap as well. Because of their metallic sheen, micas can only display their color by reflecting light; therefore, they work best in translucent soaps. They blend very smoothly, but a larger amount is required than if you were coloring the soap with other colorants. Micas also look nice in cold-process soap, but because some of them are coated with FD&C colorants, they should be tested before use.



When the colorant you used transfers unintentionally, and alters the look of the intended design, this is referred to as bleeding, or color migration. This usually occurs in melt-and-pour soaps, because water is mixed with the soap base to melt it,

and many colorants are water-soluble. Therefore, if you want to make a soap that, instead of being a solid color, has a pattern or design, your best bet is to use colorants that are oil-soluble; another option is to use colorants that aren't soluble, and color the soap via dispersion (meaning that the particles are suspended throughout the soap, instead of being dissolved in it). Oxides and most micas will color soap without bleeding.

Sample Recipes

Basic Soap Recipe

For Normal to Oily Skin

Ingredients:

- 598g coconut oil
- 296g vegetable shortening
- 30g beeswax
- 58g avocado oil
- 150g lye (6% discount)
- 368ml distilled water

Mix the lye and water, and set aside. Heat the avocado and coconut oils, vegetable shortening, and beeswax to approximately 110°F. When both mixtures are at the proper temperature, mix them together. It should take about 15 minutes for the mixture to trace. When it does, pour it into the molds, and allow it to set for 24 hours. After removing it from the molds, allow it to cure for approximately 3 weeks before packaging/using the bars.

Olive and Palm Soap

For Sensitive or Dry Skin

Ingredients:

- 680g olive oil
- 302g palm oil
- 18g beeswax
- 128g lye (6% discount)
- 374ml distilled water

Mix the lye and water, and set aside. Heat the olive and palm oils and beeswax to approximately 110°F. When both mixtures are at the proper temperature, mix them together. It should take about 25 minutes for the mixture to trace. When it does, pour it into the molds, and allow it to set for 24 hours. After removing it from the molds, allow it to cure for approximately 4 weeks before packaging/using the bars.

Lavender Soap

Ingredients:

- 6.8oz palm oil
- 10.2 oz. coconut oil
- 1.7 oz cocoa butter
- 10.2 oz. olive oil
- 1.7 oz. castor oil
- 3.4 oz. sunflower oil
- 4.9 oz. lye
- 11.3 oz. of water
- 2 tablespoons of lightly ground lavender buds
- .4 oz. orange essential oil
- .4 oz. patchouli essential oil

- .8 oz. lavender essential oil

Mix the lye and water, and set aside. Heat the base oils to approximately 110°F. When both mixtures are at the proper temperature, mix them together. It should take about 25 minutes for the mixture to trace. When it does, add the essential oils and lavender buds, and mix thoroughly; pour the batter into the molds, and allow it to set for 24 hours. After removing it from the molds, allow it to cure for approximately 4 weeks before packaging/using the bars.

Basic All-Vegetable Soap

Ingredients:

- 28 oz. coconut oil
- 24 oz. olive oil
- 30 oz. vegetable shortening
- 12 oz. lye
- 32 oz. distilled water
- 1.5 to 4 oz. essential oils/fragrance

Mix the lye and water, and set aside. Heat the base oils to approximately 110°F (can be anywhere between 95°F and 120°F). When both mixtures are at the proper temperature, mix them together. It should take about 25 minutes for the mixture to trace. When it does, add the essential oils, and mix thoroughly; pour the batter into the molds, and allow it to set for 24 hours. After removing it from the molds, allow it to cure for approximately 4 weeks before packaging/using the bars.

Common Problems and Solutions

Below is a table containing some of the most common difficulties that soap-makers encounter, as well as a cause and solution for each.

TABLE 4

Problem	Cause	Solution
Mixture sets too slowly	Too much unsaturated fat; not enough lye, or too much water; not stirred enough; stirred too slowly	Check water, oil and lye measurements; if possible, use a stick blender
Mixture sets too quickly	Fat and/or lye is too hot; too much saturated fat; fats/oils react to synthetic fragrance or other additive	Check temperature; adjust ratio of saturated and unsaturated fats; remove any synthetic additives (Mixture can still be used; pour into molds as quickly as possible.)
Mixture curdles while stirring	Fat and/or lye is too hot; not stirred enough; stirred too slowly; synthetic fragrances used	Check temperature; if possible, use a stick blender; use natural fragrances, such as essential oils, instead of synthetic ones
Mixture is grainy	Fat and/or lye is too hot, or too cold; not stirred enough; stirred too slowly	Check temperature; if possible, use a stick blender (Mixture can still be used; should only affect the look of the soap.)

Mixture is lumpy	Oils or lye were too hot when mixed; not stirred enough; stirred too slowly	Check temperatures; if possible, use a stick blender (Soap most likely will be unusable; check after removing from mold.)
Soap won't trace	Not enough lye; too much water; wrong temperature; not stirred enough; stirred too slowly; too high percentage of unsaturated fats in base oil	Check water, oil and lye measurements; check temperature; if possible, use a stick blender; adjust ratio of unsaturated and saturated fats
Layer of oil forms on soap as it cools	Too much fat; not enough lye	Check fat and lye measurements (Soap may still be usable; if it is caustic, or doesn't lather well, discard it)
Soap separates in mold	Not enough lye; not boiled long enough; not stirred enough; stirred too slowly	Check lye measurements; if possible, use a stick blender
Soap leaks clear liquid when cut, or pockets of powdered lye are present	Too much lye; not stirred enough; stirred too slowly	Check lye measurements; if possible, use a stick blender (Soap may still be usable after washing away excess lye, but it is safer to discard the bars)
Soap is soft or spongy	Not enough lye; too much water; too much unsaturated fat	Check lye and water measurements; adjust ratio of unsaturated and saturated fats (Soap may be usable after an additional 2-3 weeks of curing; if it is still soft, discard it)
Soap is hard or brittle	Too much lye; too much dry ingredients; traced too long	Discard; check lye measurements for next batch; ensure proper tracing time; if possible, use a stick blender
Soap smells rancid	Poor quality fat; too much fat; not enough lye	Check lye and fat measurements

Air bubbles in soap	Stirred too long	Stir by hand, instead of using a stick blender (Soap is still usable)
Mottled/spotted soap	Not stirred enough; stirred too slowly; temperature fluctuations during molding	If possible, use a stick blender; stabilizing temperature during molding phase (Soap is still usable)
White powder on cured soap	Hard water; lye not dissolved properly; reaction with air	Use distilled or bottled water; heat water to proper temperature before dissolving lye; seal molding containers (If there is a large quantity of powder, soap is unusable, and must be discarded)
Warped soap	Drying conditions not consistent	Dry on a rack, and do not disturb (Soap is still usable; if desired, whittle the soap down, or cut it up for rebatching)

Scenting Your Soap

As stated earlier, the best substances for adding scent to your homemade soap are essential oils. There are three categories of essential oils; top, middle, and base. The top note is immediately perceived, and usually the first to disperse; the middle note provides most of the scent's character; the base note is the last to be noticed, but usually the strongest, and tends to remain after the other scents have faded. A general guideline is to use 3 parts top note, 2 parts middle note, and 1 part base note. The amount of oil you will use will vary based on the size of your batch, and individual preferences; however, a good guideline to follow is 15-20 ml of the top note oil, 5-10 ml of the middle note, and 2.5-5 ml of the base note, per 700 ml batch of soap. You should always use all three notes, but you may not want to include any more than three; too many scents can overpower the senses, and lessen your ability to appreciate each scent. It's also difficult to find more than three scents that work well together. If you use essential oils, a fixative such as orris root can help the soap retain the scent of the oils; about ½ teaspoon of fixative per 700ml batch should be sufficient.

There are many charts that you can use to determine which oils are top, middle, or base notes; these charts or tables should also tell you how much of each scent to use. However, your personal scent preference may differ from the recommendations in the charts. The best way to test a scent that you think you'd like is to gather the essential oils, and test them in a jar, or other container. Dip one end of a clean cotton swab in each jar of oil (be sure to use a different swab for each oil, to avoid contamination), and put the swabs into a glass jar. Cover the jar, and check it after a few minutes, a few hours, and 24 hours. Be sure to take notes on what you notice – which scent dissipated first, whether one scent overpowered another, et cetera.

The swab test will give you an idea of whether you like the scents, and how they blend together. However, to really get a feel for how the scents will interact when the proper amounts of all three are included, you would have to blend them in the correct proportions. Mix the three oils in the correct ratio, but use very small amounts; for example, your recipe calls for 1 tablespoon of oil A, 1 ½ tablespoons of oil B, and 3 tablespoons of oil C. For the test, use 2 drops of oil A, 3 drops of oil B, and 6 drops of oil C. (As with the swab test, be sure to use a different pipette for each oil.) This way, you can avoid wasting the oil, if you decide that you don't like the proportional blend. Blend the small amounts of oil together in a glass jar, and check it at the same intervals as the swab test. After 24 hours, the oil blend should smell about the same as it will in the soap. If you are testing more than one scent combination, it may help to have some coffee grounds handy – sniffing the coffee grounds will cleanse your scent receptors in between each test, so you will get a more accurate idea of each scent.

If you are having trouble getting your soap to retain its scent, there are several tricks you can try. If you are following the 100-110°F rule for mixing the fat and lye, try mixing them together at a slightly lower temperature. The temperature of the mixtures can be as low as 85°F; as long as the mixtures are within 10°F of one another, they can be mixed, and the soap will still be fine. Also, the soap does not necessarily have to be insulated during the molding process, and many soaps aren't. You can try doing the same with your soap, if you're having trouble getting your scent to stick – although, depending on the recipe, it may not produce the desired result.

If you normally make soap using the cold-process method, you can try the hot-process method. Unlike the cold-process method, the hot-process method saponifies

the soap before it goes into the mold, so when the essential oils are added, they won't react with the already neutralized lye. If you are using ground herbs, pumice, or other solid additives, soak them in your essential oil blend before adding them to the soap; they will release the essential oils slowly, and make the scent last longer.

Beware of citrus oils; these can cause the soap mix to curdle, and should be used in very small amounts, if at all. Also, citrus oils (and other top-note oils) have a tendency to disperse sooner, because they have a lower evaporation point than other, heartier oils. If you want to use citrus oils in your soap, add them at trace, instead of in the base oil, so they won't adversely affect the soap-making process. If there is a scent you love that is prone to disappearing quickly, try using another, similar scent that sticks around longer. Also, always use top, middle and base notes; even if you only want a single scent, use other scents that are similar or complementary, so that the scent will have more staying power.

The best time to mix your essential oils is as the soap batter is beginning to thicken, but before it has reached the trace stage. If you mix the essential oils any earlier, some of the oil will evaporate, because the oils are highly volatile. So, mix them just before you are about to use them. Also, use a spoon to mix the essential oils with the batter, instead of a stick blender; a stick blender can cause the soap mixture to seize, at which point you'll be unable to pour the soap into molds.

Selling Your Product

Many amateur soap-makers begin making soap simply because it is a fun and rewarding hobby. Others, however, hope to turn their hobby into a source of income. For stay-at-home moms, those who are unemployed or cannot work, or even for those who want a part-time income, soap-making can be a great idea. With a few hours' work, you can turn a minimal investment in equipment and ingredients into a product that is potentially worth a great deal of money. It is possible to turn a profit selling soap, but it is not as simple as making the soap and exchanging it for money. There are lots of factors to take into account, if you want your soap to stand out against the competition, and actually turn a profit.

One of the benefits of starting a soap-making business is that, unlike a lot of other entrepreneurial ventures, the startup costs are quite low. The basic ingredients – lye, water, and fats – are cheap, and so is most of the equipment. In fact, most of the equipment is stuff that you probably already have in your home. So, you can make a good (if plain) bar of soap for a very low price. The expensive part is the additives – essential oils, herbs, et cetera. If you want to turn a profit on your soap, you are going to have to shop carefully, and try to obtain the highest-quality ingredients for the lowest possible price. Otherwise, the price of your soap will be too high, and people will be unlikely to buy it.

Packaging and Presentation

Once your soap is completed, you'll want to package it to reflect the care, effort and pride that you put into your product. Hand-made soap is more expensive than mass-produced brands, and with good reason; the ingredients are of a higher quality, the results are superior, and it takes longer to make. However, to compete with the mass-produced soaps, your packaging needs to reflect all of the reasons that spending the extra money on your soap is worthwhile to the buyer.

With each soap, you'll want to include a tag with your company's logo, name and contact information (or just your own), as well as a detailed list of ingredients in the soap, the properties of the herbs or oils contained within it, et cetera. You want to convince the buyer to purchase your soap for the first time, and provide them with enough information to purchase from you again if they like your product. You can have tags printed for you, if you want to make them really fancy, but it is just as easy (and much cheaper) to make them at home. Buy white or colored card stock (stiff, heavy-weight printing paper) at any office supply store, and print your logo or text in a repeating grid pattern on the page. Cut them with straight scissors, or, to make interesting patterns, use fabric scissors to make just about any shape you'd like. Use a

hole-punch to make a hole in one corner, and attach them to your soaps with ribbon, yarn, embroidery floss, or any other decorative string. To make stickers, you can purchase sheets of sticker paper that are pre-cut (intended for address labels or gift tags), or solid pages that you can cut to any size and shape you'd like.

If your soaps are scented, you'll want to choose a packaging that allows the buyer to smell it, to determine if they like the scent, and if it is strong enough. A good way to do this is to wrap the soap in a cloth mesh bag, which protects the soap from coming into contact with other bars, while allowing the consumer to smell and see it. The packaging can be an actual cloth bag, though that will be expensive; your best bet is to buy a large quantity of mesh cloth, and to cut it into squares or circles yourself. Then you can tie the top with a ribbon, string, or any decorative material you like. A small paper tag can be tied to the top of the bag, or placed inside; you'll most likely want to include the tag on the outside of the bag, so that buyers have any information necessary to convince them to purchase from you for the first time, and so that they know what the soap contains, and what it will do for their skin.

If the soap is molded into bars (and especially if you want to show off the color of the soap), you can wrap a square of paper or cardboard around the soap, leaving a bit of soap exposed on either end; this will allow buyers to see the soap's color and texture. If the soaps are created in a candy mold, and you want to show off the shape or detail on the surface, you could package the soaps in a mesh bag. You might also want to wrap them in clear cellophane, and seal them with a sticker on the bottom. If your soap is in plain bars, there are a variety of ways to make it look more exciting. You can wrap your soaps in colored gift wrap, or patterned printing paper; be sure to wrap it in wax paper first, though, to avoid discoloration of the soap or paper.

If you want to make soaps as gifts, or sell them as custom orders, then your packaging, and even the soap itself, can be even more elaborate. You can create monogrammed soaps, by using a mold that will create a raised letter on the surface of the soap; to make this soap even more striking, you can place the molded bar in another mold, with the raised letter resting on the bottom. Pour soap of another color around the already molded and monogrammed bar; the second soap will fill in the gaps, and coat the first bar. So, for example, you could have a bar of deep purple soap, with a white "A" on the surface, or vice versa. You can also create soaps that have a custom tag, for weddings, anniversaries, christenings, or any other special

event; for these, you may want to put names, birthdays, dates, or any other information that will help people remember their special day. Scented soaps in cloth bags are often a good choice for these types of mementos, since the soap will, most likely, not be used, except as a sachet or decoration.

Where to Sell Your Soap

One of the easiest and most cost-effective ways to sell your soap is at craft fairs, flea markets, farmers' markets, or other festivals. Tables at these types of events are generally fairly cheap, and people go there expecting to spend money. Therefore, if your soap isn't ludicrously over-priced, odds are pretty good that someone will consider it a low-cost luxury; people like things that are hand-made, it is a nice alternative to mass-produced soaps, and they make very nice, but cost-effective, gifts.

If you don't have the time to go to craft fairs to sell your product, and can't find anyone to go in your stead, there are other options to sell your soap. You can try selling your soap online, through stores like eBay or Amazon. These retailers will take a cut of your profits, though, and you are competing with all of the other people who are trying to do the same thing you are, which will drive down your prices. If you want to sell your soap without anyone taking a percentage of the sale price, you can try creating your own web store. The disadvantage of doing it this way is that you will not generate a fraction of the traffic that huge websites like eBay get every day. Also, if you want to use search engines like Bing or Google to bring traffic to your site, you will need to place bids with them, in order to have your business appear as a featured result, or near the top of the list.

You can sell it wholesale to retailers, but you will probably get less profit, since you will be selling it to them for a much lower price than what they will charge the public. Another option is consignment shops, which operate on a similar, but slightly different, principle; when selling your soap to a retailer, they pay you the wholesale price upfront, then attempt to sell your product. If the product doesn't sell, they lose the money, not you – but, they probably won't buy from you again. Consignment shops, on the other hand, pay you as your product sells; they take a percentage of the sale price, but it is not as high as the chunk that larger retailers will take. The disadvantage of selling in a consignment shop is that, if the soap doesn't sell, you and the shop lose money. Also, there is typically a limited amount of time that a consignment shop will keep your merchandise on its shelves.

FDA Regulation of Soap

In the United States, the Food and Drug Administration (FDA) does not regulate soap. However, their definition of "soap" is very narrow. In order for your soap to be considered as such by the FDA, it must consist of alkali, fatty acids, and water, and very little else. Also, the only claim that you can make, regarding your soap, is that it cleanses the body. That's it. Melt-and-pour, hot- and cold-process soaps all fall into this category, as long as no claims are made regarding what the soap can do. If, however, you say that your soap moisturizes, soothes dry skin, helps prevent wrinkles, etc., then it is defined, by the FDA, as a cosmetic and, as such, is subject to being regulated by the FDA. If you say that it is intended to treat skin conditions, such as eczema or psoriasis, then it is considered a drug, and is also subject to FDA regulation. The FDA does not require ingredient labels on soaps, but consumers appreciate this information; also, if you keep a separate list of what each ingredient can do, consumers will be able to tell what your soap can do, without you making any claims on the label.

Liability

Many entrepreneurs research the creation and marketing of their product, but some forget one important detail: liability. In today's litigious society, there is no way to safeguard yourself against being sued. However, there are ways that you can protect your personal assets, in case of a lawsuit.

Many business owners believe that their homeowner's insurance will cover them in case of a lawsuit. This is not usually the case. Some policies will cover a small amount of business property (up to $2,500, usually), but even these won't cover lawsuits. If someone sues you for any reason, you are personally liable for not only damages awarded in the suit, but also any lawyer's fees and court fees incurred by both parties. Even if you win the suit, you will still be responsible for your own lawyer's fees. A good business insurance policy will include liability coverage, so that you will not be personally responsible for any such costs that are incurred. However, make sure you understand any limitations on your policy – for example, the cap on settlement payouts, or the number of settlements the policy will cover over a set period of time.

Lawsuits are not the only liability to consider when starting your own business. What happens if the store you are selling your product in catches fire, and you lose thousands of dollars' worth of merchandise? What if your home is robbed and all of your equipment is stolen? The average business insurance policy will include property insurance, which will not only pay for your lost property and equipment, but will also cover your lost wages while you are unable to make your product. (Some of these policies, however, only cover your property while it is on-premises; be sure to check your policy to see if it covers your property while at a craft show or retailer. If not, many companies have policy extensions that you can purchase to ensure coverage.) Some policies cover 100% of the income you were generating prior to your loss, while others cover only a portion, so be sure to ask about your loss of income coverage.

Aside from the advantages of having your property and equipment protected, your business insurance offers protection to any retailers that sell your product. In fact, many retailers and craft shows will request – and in some cases, require – proof of

insurance before they allow you to sell your product there. Having business insurance signals to the retailer with whom you do business that you are serious about your business, and about protecting your assets, which may make them more likely to do business with you.

The cost of a business insurance policy can vary greatly. Be sure to update your coverage based on the amount of property that you have; the cost of the policy is based on the amount of coverage you need. You won't want to pay extra for a policy that is too large for your needs, if you downsize; at the same time, your policy may not be large enough after a major purchase. Also, check the types of losses that are covered in the policy. Some policies will cover fire, but not theft; there are very few policies which cover earthquake or flood damage, and it usually costs extra. Ask about your deductible – the amount that you are responsible to pay, before the insurance company covers anything. Policies with a higher deductible are usually cheaper, because the insurance company has a smaller chance of actually having to pay out; however, remember that you are taking a risk, because any money you save on the premium is money that you may have to pay to cover your own costs, if your loss falls below the deductible amount.

If your annual sales are low, or if you are selling only to people that you know, then you may choose not to have business insurance. It is entirely your decision whether investing in business insurance is right for you. However, it is important to note that, while your premium may seem like a waste of money if nothing happens, you will be very glad to have that policy if something does happen.

It is generally a good idea to maintain a customer complaint file, to keep track of any complaints you happen to receive. Track the customer who complained, the complaint date, what the complaint was, and what you did to resolve the complaint. If you are utilizing a batch code system, you can look up the specific batch the customer is complaining about, and find out if you did anything out of the ordinary with that particular batch. The batch notes will help you determine what went wrong, and, if necessary, dispose of the defective batch to prevent any further issues. (Keeping track of your complaints, and what you do to resolve them, will also help in case of a lawsuit, or other action against your company.)

Glossary

Additive – Any ingredient that is not part of the soap itself. Anything in your soap other than lye, water and oil, is considered an additive. This includes any materials you add at trace, as well as any unsaponified oils that are present after the neutralization process has occurred.

Alkali – A base, or substance with a pH between 7 and 14.

Antioxidant – A substance that prevents oxidation, or spoilage.

Batch Code – A numeric (or alphanumeric) code that helps the soap-maker identify all of the soaps from a given batch, and any pertinent information about that batch.

Batch Code Sheet – A record, linked to the batch code, which contains any and all pertinent information about a batch of soap; what it contains, who made it, etc.

Caustic – An adjective used to describe a corrosive substance, which damages organic material or tissue on contact. Lye is caustic, and should be handled with great care.

Cold-Process Method – Method of soap-making in which no external heat is added to the soap batter after it is mixed. Saponification takes place while the soap is molding.

Deliquescent – Adjective used to describe a material that is prone to dissolve or melt when in contact with open air.

Detergent – A chemical that acts in a manner similar to soap, but is synthetically made.

Emulsifier – A substance that allows one material to dissolve into another, immiscible material.

Essential oil – A volatile oil which is extracted from plant matter by distillation, expression, or chemical solvents.

Exothermic – Characterized by a release of heat; often used to describe chemical reactions in which heat is a byproduct.

Fatty Acids – Compounds found in fat molecules; primarily responsible for soap's lathering, hardness, and conditioning characteristics.

Fixatives – Substances used to slow the process of evaporation; commonly used in conjunction with essential oils.

Fixed oil – An oil which can be raised to a high temperature without evaporating.

Flash point – The lowest temperature at which a substance, or its vapors, will ignite, in the presence of a source of ignition.

Fragrance oils – Blends of synthetic aromatic chemicals, diluted with a carrier such as alcohol, propylene glycol, vegetable oil or mineral oil.

Full-Boiled Method – Method of soap-making most commonly favored by commercial soap-makers. All ingredients are combined at once, and cooked until saponification is complete.

Gel Phase – An early stage of the saponification process, when the soap mixture temporarily becomes a clear gel; the mixture later returns to its original opacity and thickness. Not all soap recipes will have a gel phase.

Glycerin – A thick, sticky, clear substance that is a byproduct of the soap-making process. Very moisturizing, and a great skin conditioner.

Hard Water – Water that has an overabundance of minerals. Commonly leaves mineral deposits on surfaces, and reduces the effectiveness of surfactants.

Hot-Process Method – Method of soap-making in which the batter is "cooked" after the lye, water and oils are mixed together. Saponification takes place after the trace stage, while the mixture is heated.

Humectant – Moisturizer.

Hydrophilic – Attracted to water. Water, and substances that can be dissolved in it, are hydrophilic.

Hydrophobic – Repelled by water. Oil, and substances that can be dissolved in it, are hydrophobic.

Hygroscopic – An adjective used to describe a material that has a tendency to absorb moisture from the air.

Immiscible – A substance into which a material cannot dissolve.

Lye – Sodium hydroxide (NaOH) or potassium hydroxide (KOH). Sodium hydroxide makes hard soap; potassium hydroxide makes softer soap, and is typically used to make liquid soap or shaving cream.

Lye discount – The process of withholding a percentage of the lye needed to saponify the fats from the soap mixture. For example, a 5% lye discount means that only 95% of the amount of lye necessary to neutralize all of the oils is actually used. Also called superfat discounting.

Material Safety Data Sheet (MSDS) – Contains important handling and safety information for the given material. Always review the MSDS before working with a new material.

Melt-and-Pour Process – A method of soap-making in which premade soap base is used to make soap. The soap-maker melts the soap base, adds his or her own additives, and remolds the bars. Easy and safe, but little control over ingredient quality, and can be expensive.

Micelles – Clusters of molecules that surround and suspend another. Soap molecules form micelles to surround and suspend grease particles.

Oleochemicals – Chemicals derived from fats and oils.

Petrochemicals – Chemicals derived from fossil fuels.

pH – Scale used to measure the acidity or alkalinity of a substance. The pH of a substance can range from 0, for very acidic materials, to 14 for alkaline (or basic) substances, with 7 being neutral.

pH Tongue Test – Quick test to determine pH level of soap.

Phenolphthalein – A reagent that can be used to detect high levels of pH. This chemical is clear, and will turn pink if it comes into contact with a substance that has a pH over 7; the darker the pink, the higher the pH.

Potassium Hydroxide – KOH; also called potash, caustic potash, potash lye, and potassium hydrate. Commonly used to make liquid soaps.

Rebatching (Rebatch Process) – Method of soap-making in which previously made soap is melted and remixed to form new bars.

Saponification – Refers to the chemical process in which lye and oils are combined, and neutralize one another, forming soap.

Saponification Value (SAP value) – The number of milligrams of lye required to completely saponify one gram of a specific fat.

Saturated Fats – Fats that are solid at room temperature. These fats make a very hard bar of soap, and must be melted before use.

Seize – The phase of cold-process or hot-process soap-making when saponification is complete, and the batter begins to solidify, and becomes too thick to mix or pour into a mold. The soap must be molded before this phase.

Soap – Anionic surfactant. Technically a salt, produced via the chemical reaction between lye and fat.

Sodium Hydroxide – NaOH; also called lye, ascarite, caustic soda, soda ash, soda lye, sodium hydrate, and white caustic. Commonly used to make solid soaps.

Sodium Tallowate – Rendered beef tallow.

Superfatting – Soap-making process in which fats or oils are added to the soap mixture in excess of what is needed to completely saponify the lye.

Trace – The point, during cold- or hot-process soap-making, when the batter becomes noticeably thicker. When a spoonful of batter, drizzled across the surface of the mixture, leaves a visible trace, the trace stage has begun. At this point, the saponification process is 80-90% complete.

Triglycerides – Compound present in fats and oils; made up of three fatty acids, attached to a glycerin. When it reacts with lye, it yields soap and glycerin.

Unsaturated Fats – Fats that are liquid at room temperature. Must be combined with saturated fats to create a hard bar of soap. Can be used to make liquid soap.

Volatile – Adjective used to describe materials (such as essential oils) that become a vapor at relatively low temperatures.

Warm-Process Method – Method of soap-making in which the filled soap molds are saponified in an oven, instead of being boiled (hot-process method) or saponifying in the molds (cold-process method).