

# Soap Making Safety



Natures Garden takes safety seriously. When it comes to crafting soap, protective gear is mandatory. It is also just as important to have a safe and clean work environment.

Before even getting started making soap, ensure that you have all of your ingredients in your work area. Being prepared is one key factor in successful crafting. Once you get started, it is vital that you stay in your work area. Leaving certain ingredients such as lye out in the open can lead to very serious and dangerous situations. While you are prepping your area, it is also important to make sure that you have the proper soaping equipment, and it is in working order. Be sure to check the batteries on your scales to be certain they do not need changed before beginning the soap making process.

During the soap making process it is very important that you do not rush. Since soap making is a science, and you will want to ensure that everything is measured out exactly. Soap recipes are measured by weight units, not volume units. In other words, if a recipe calls for 8 oz. of [coconut oil](#), you will need to weigh out 8 oz. of coconut oil on your scales. Take your time and move methodically. The best way to work is in an organized fashion. It is also very important that while you are making soap you are able to concentrate and work uninterrupted.

## Safety gear for you from head to toe:

- Hair should be tied back and away from your face.
- Protective eye gear or [safety goggles](#) should be worn at all times to prevent anything from getting into your eyes.
- Shirts should be long sleeve.
- [Rubber Gloves](#) should be worn during the whole soaping process.
- Pants should also be worn.
- Shoes must be worn. Nothing that is open toed or leaves any portion of your feet exposed.
- A [facial mask](#) is suggested for the mixing of the water and lye.
- Always wear an apron.

## Safety gear for your work environment:

- Cover your work area with a protective layer (like several layers of newspaper, or old towels/blankets)
- Prepare a Spray bottle filled with vinegar

## Equipment:

Once these tools have been designated as your soaping materials and used, they can never be used for anything but soap making. We advise that you clearly mark everything and keep it separated from your other kitchen utensils. As a suggestion: If your work area is in your home, large storage containers with lids work wonderfully for storage. Using a large storage tote provides you the benefit of having all of your items and equipment in one place, as well as, the capability of removing the storage tote and placing it in a lesser traveled area of your home such as the basement.

- Proper containers for weighing out recipe (heavy duty plastic or stainless). [Fragrance oils](#) can eat right through certain plastics. PET and HDPE are the best plastics when working with fragrance and [essential oils](#). NEVER use anything composed of aluminum!
- [Thermometer](#)
- Towels
- Stick Blender
- Mixing utensils (rubber or stainless steel). Wood will break down over time and can eventually leave splinters in your soap batter.
- Scale
- Notebook & pen
- Paper Towels or old rags
- [Mold for soap](#)
- Freezer paper
- Spatulas (rubber, silicone works the best)
- Old blanket or towel for insulation purposes
- Large containers for the blending of the oils and lye solution (heavy duty plastic or stainless steel). Never use glass to mix your lye solution; it can crack and break.
- A permanent black sharpie marker to mark every piece of equipment you use "CAUTION-LYE". After you use this equipment to make soap, you will never be able to use them for food-contact again.

## Lye:

The most dangerous aspect in the soap making process is Lye; Sodium Hydroxide (NaOH) is the lye used for bar soaps, and Potassium Hydroxide (KOH) is the lye used to make liquid soaps. NaOH is also referred to as caustic soda; while KOH is referred to as Caustic potash. Essential to the saponification process, lye is used with distilled water to make your lye water solution. It is extremely important that you are in a well ventilated area while working with lye. If you have small children or pets, you may want to consider doing this portion outside or in a garage. Regardless of where you choose to mix your lye water solution, it is advisable to remove all pets and children from the area where you will be working with lye. It is estimated that 5,000 accidental lye ingestions occur each year by children under 5 years of age.

Lye can lead to death if ingested, so it is best not to take any chances. In fact, ingestion of bases such as NaOH (lye) produce the most significant injuries to our bodies.

If ingested, seek medical help immediately. Do not induce vomiting unless directed by medical personnel or poison control. Milk or water may be given to the person unless informed otherwise by medical personnel. Do not give the person milk or water if they are unconscious, vomiting, having convulsions, or if the person is showing a decreased level of alertness. Loosen any restricting clothing such as ties, collars, belts, buckles.

The phone number for the National Poison Control Center is 1-800-222-1222 (US only). The National Poison Control Center can also be contacted in non-emergency situations such as Poison Prevention. The center is open 24 hours a day, 7 days a week.

The lye solution is made up of lye and distilled water. Because the solution is a chemical reaction, it has an exothermal reaction. This means that heat is given off as the chemical breakdown occurs. One tip that we learned is to divide the amount of grams of water you need for your recipe between water and ice cubes. This will help reduce the lye solution temperature so that you are able to begin making soap faster. The solution, even with ice water, will still be very hot. Be cautious.

Before you begin the soap making process, be certain that you are wearing protective gear: [Protective safety glasses](#), a [mask](#), [gloves](#), an apron, shoes, a long sleeve shirt, pants, and shoes that cover your entire feet (nothing open toed). Have your pets and children away from your soaping area. Now, let's get started.

Using two separate, heavy duty plastic containers, weigh out your lye according to your recipe in one of the containers, then weigh out your water in the other container. Slowly pour the lye into the water. **Never ever pour the water into the lye!** You do not want to pour the entire lye amount directly

into the water either. It is best if you slowly sprinkle the lye into your water and constantly mix until the lye has dissolved in the water. Your water solution will become cloudy at first, and then you should begin to see the lye dissolving into the water as you mix. Be extremely careful with this step. Adding too much lye too fast will cause a volcano/boiling effect, and anything that the mixture touches can be damaged.

Do not mix your lye solution in glass. Glass can explode leaving your hazardous lye solution everywhere. Absolutely never use aluminum containers or aluminum tools for lye solution. Lye reacts with aluminum to produce a highly flammable hydrogen gas. It is best if you use a stainless steel or a heavy duty plastic container for mixing your lye solution. Note: Certain plastics will breakdown after repeated usage.

Mixing these two elements together is crucial to your solution. If you do not mix it completely, the lye will crystallize at the bottom of your container, and in the next step, your solution will not complete the saponification process of the oils. As you stir, you will notice two things; the water will become cloudy and get very hot. You can stop mixing once the lye solution becomes clear. Note: Sometimes, there will be pieces of white debris that is floating on top of your lye solution. These are simply impurities, and can be strained or sieved out before pouring your lye solution into your soaping oils. They will not hurt your soap.

Stand as far away from the mixture as possible, while still being able to mix it. Lye can give off fumes during this reaction that are extremely hazardous and should not be inhaled. Lye will do quite a number on your mucus membranes, irritating your throat and lungs. It is also mandatory that you wear safety goggles for this step. You do not want to get any lye or lye water solution in your eyes. This can lead to serious and permanent damage.

If while mixing your lye solution, any portion spills or splashes in your eyes: Remove any contact lenses. Start flushing your eyes with cold water immediately. Repeat this for 15 minutes. Do not rub your eyes. Seek medical help.

If while mixing your lye solution, any portion spills or splashes on your skin, start flushing with cold water immediately. Remove any clothing that may have the lye solution on it. Keep flushing and rinsing affected skin for 15 minutes. Spray your skin with vinegar to help neutralize any lye solution that is left on your skin. Seek medical help. When lye comes in contact with your skin, it literally begins making soap from the natural oils found in your skin. This is why you will notice that hands that have been exposed to lye solution will feel greasy when washing them.

If you have a serious interaction with the lye solution on your skin: Wash the affected area of your body immediately with disinfectant soap and water. Cover the area with anti-bacterial cream. Seek medical help immediately.

While waiting for your lye solution to cool down, it is important that it is set in a safe place. Do not put it near anything that is heat sensitive, since many times the temperature of the solution is over 200 degrees. You will also want to keep a visual on it for several reasons such as accidental ingestion, outside particles coming into contact with it, referencing the degrees, crystallization of lye at the bottom, pets knocking it over, etc.

Having several vinegar spray bottles in your work area, while making soap, is a very smart idea. If you only have one vinegar spray bottle, you will want to keep it close to you at all times. Vinegar is one way to neutralize the caustic lye. If a spill should happen, spray ample amounts of vinegar on contaminated area. With hot, soapy water, wash area well. Rinse and repeat. Use paper towels to dry.

[Rubber gloves](#) as well as [protective eye gear](#) should be worn through the whole soap making process. Even after the lye solution has been added to the oils, it is still a caustic mixture. Spilling or splashing any portion of this on your skin can leave a serious burn.

### **Melting your oils:**

Some of the [oils](#) that are used in soap making are hard and need to be melted down into a liquid form before they can be weighed out. This can be done in various ways such as: microwave, double boiler, hot water bath, the sun, etc. It is very important that if you do use heat like the stovetop, that you never leave oils unattended. If the oils became too hot, you risk burning the oils. Burnt oils cannot be used for soap making. Also, another stovetop safety tip: Always make sure the handles of the pots are pointed away from the edge of the stove. You do not want someone accidentally knocking your pots over, or even worse, children spilling hot oils on themselves.

### **The Clean Up:**

It is important to keep your [gloves](#), [safety goggles](#), and apron on. Until the area is completely neutralized and cleaned, you do not want to take any chances.

Since soap making is caustic you will want to ensure that your work area is properly cleaned when you are finished making your soaps. We recommend that the first step in cleaning is to neutralize the area first with vinegar. The next step will be to wipe the area down with hot soapy water, then rinse.

When washing your soaping utensils/equipment, you will also want to use hot soapy water. Since the lye solution will still be caustic you will also want to add vinegar to your soapy water to neutralize this. Rinse and dry your utensils and equipment. Store all soaping supplies together and out of the reach of children and pets.

If you have designated rags specifically for soaping, you will want to wash them by hand. Once you are finished with your soaping rags, place them in a vinegar and water solution to soak. This will neutralize any active lye. Once they have soaked for awhile, place the rags in hot soapy water and give them a good jostle, making sure that the soapy water is thoroughly getting all over the rag. Then let the rags soak a little while longer. Then, get rid of the soapy water, and rinse the rags out. You know all of the soap is off once the bubbles stop forming and the water rinsing through the rag is clear. Wring out any excess water, and hang dry. Place with other soaping materials when finished.

#### **Disposal of lye solution:**

If your work area has a septic tank, you do not want to pour it down the drain or flush it down the toilet. The best suggestion that we have is to use your lye solution in a "false batter". Mix your lye solution with vegetable oil. You are looking for just the right amount to get trace when you stick blend it. Once trace is established, simply take your spatula, and dump it right into a garbage bag. Allow the soap batter to set up, then take it to your trash container and dispose of it. Do not attempt to dispose of the soap batter while it is still fluid; the bag could break and spill the soap batter all over your garbage container.

#### **Checking your soap for pH safety:**

There are various ways to check your cured or curing bars for their safety of use. You never want to use or sell a bar of soap that has not cured completely. An uncured bar means that there is still active lye solution in your soap. Washing with this soap could result in very serious skin irritation and even burns.

The first and best way to check whether your cp bars are cured is to pH strip them. Using this method is concrete. If the number that you get from the pH strip does not fall between the correct range, then, the soap still needs a little more cure time.

The pH scale ranges from 0-14. The pH scale measures the amount of acidity or alkalinity a substance has. If the number falls between 0-6, then your substance is an acid. If the number falls between 8-14, then your substance is a base. If the number is 7, then it is a neutralized substance. Soap is a base, because of the lye solution used. The range that you are seeking to see if your cp bars have cured is 8.5-10.5. Please note that the 10.5 pH level is for that of industrial strength soap. 8.5 is the typical pH for homemade soap that is used on the body.

The second way to check your soap for active lye is to wash your hands with the soap. We only advise this if you are sure that the majority of the cure process has already taken place. If there is any active lye left, you will have a greasy feel on your hands that will seem to not want to wash away. Even if you wash your hands with another bar of cured soap, the greasy feel will still be there. Your hands will also tingle or burn. This is because the active lye from the high pH bar is saponifying the natural oils in your skin. This soap bar would still need more cure time.

The final way to check if your cp bars are cured is to do a "tongue test", or a "zap test". This involves sticking your tongue on the bar of soap. If it zaps your tongue (just like a 9V battery does), then your soap still has active lye and needs to complete the curing process.

Natures Garden does not advise the tongue test as a way to check a curing bar of soap. Lye is extremely caustic and does serious damage to our bodies. Why take the chance on active lye, when you can use a pH strip and get a safe result?

If you plan to resell your handcrafted soap (after testing for a long time), please follow the FDA guidelines on how to label your product. We will discuss product labeling in a future class. In the mean time...Happy Safe Soaping!



Nature's Garden

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