

The Essentialist

May 29, 2008

Bigfork's Essential Stuff Newsletter -- Bringing People Together
A Publication of the Essential Stuff Project, Bigfork, Montana

Liquid Soap from Scratch

Of course, you can always make a liquid soap from a bar of soap by heating gratings from the bar in water with a bit of glycerine. Or you can make it directly, according to the instructions here. This process takes a lot longer than making bar soap, and requires a good bit of patience, but once it is finished, it's already a liquid.

However, because liquid soap from scratch has a few nuances that make it more complex, it is best to become familiar with the basic process by making bar soap before attempting liquid soap.

While the bar soap recipe is a cold process soap (no extra heat is required to generate the reaction), liquid soap is a hot process soap, requiring extra heat provided by a crock pot, large double boiler, or slow oven.

Liquid soap requires a different alkali than bar soap; that is, potassium hydroxide (KOH) instead of sodium hydroxide. Unlike sodium hydroxide, KOH crystals contain water in the crystalline structure. Thus, more KOH crystals are required to provide pure KOH to the solution.

Liquid soap recipes appear to have an excess of lye approaching 12%, but that excess is mostly due to the weight of water in the crystals. The excess of actual lye is only about 2%, to ensure ALL the fat/oil is saponified. If some oil remained, it would make the soap cloudy. The excess lye is then neutralized out near the end of the process, so that your soap will not cause burning or other caustic effects. The lye calculator on [Summer Bee Meadow](#) website takes this into account.

Safety Precautions

Lye is extremely caustic and dangerous; be very careful when working with it, and take these precautions:

- ✓ *Read and understand each step before beginning;*
- ✓ *Understand basic soap making procedures;*
- ✓ *Assemble all ingredients & equipment; ensure all utensils are in good working order;*
- ✓ *Protect work surface and floor with layers of newspaper or old vinyl tablecloths;*
- ✓ *Keep children and pets away from the work area;*
- ✓ *Have 1 or 2 gallon-bottles of white vinegar on hand to neutralize any spilt lye;*
- ✓ *Work methodically and without distraction;*
- ✓ *Never leave heating oils unattended;*
- ✓ *Wear **safety goggles, rubber gloves**, and an extra layer of old clothing.*
- ✓ *The soap remains caustic for 24 hours after making; take care during entire time.*

Liquid Soap Recipe:

This recipe is from [Candle and Soap](#), by David Fisher, who says it is tried and true. Refer to reference 7 at the end of this article.

Ingredients:

- 16.5 oz Sunflower Oil
- 7 oz Coconut Oil
- 5.5 oz. KOH
- 16.5 oz. distilled water for lye mixture
- 40 oz. distilled water to dilute the soap paste
- either 2 oz of boric acid, or 3 oz of borax (will be mixed with distilled water)
- 3 oz. fragrance or essential oil, as desired

Equipment for lye solution:

- tall pitcher with lid (dishwasher safe)
- stainless steel spoon
- mason jar

Equipment for soap:

- scale (postal scale that measures to 0.1 oz is preferred)
- glass pitcher (like a quart Pyrex measure)
- small glass pitcher (like a 1-cup Pyrex measure)
- large crock pot (or large double boiler will work)
- thermometer, such as for heating milk
- immersion blender (hand-held, or stick, blender)
- potato masher and/or flat whisk (recommended)
- lots of patience!

Basic Soap Making Instructions for Liquid Soap (Hot Process)

1. Clear your calendar before starting. This process takes the better part of a day.
2. Clear workspace, gather ingredients & equipment, and re-read safety precautions.

Measure, Mix and Heat to Trace

3. Measure oils. You can measure both solid and liquid oils in the same pitcher. [NOTE: If using a double boiler, measure oils directly into the top of the double boiler.]
 - ★ Place glass pitcher on scale and zero-out the weight. Carefully pour sunflower oil into the pot/pitcher to exact desired amount. Keeping the pitcher on the scale, zero-out the scale again, and add desired weight of coconut oil; etc..)
 - ★ If using essential oils or fragrance, weigh them in a separate glass cup (after zeroing-out the weight of the cup) and set aside.
4. Transfer oils to the crock pot, set to low heat. Warm the mixture to about 160 degrees F, and keep it there throughout..
5. Make your lye solution with potassium hydroxide while oils are warming (see [recipe](#) below). No need to cool before mixing with the oils). **Wear goggles and gloves!** KOH is more volatile in the water than sodium hydroxide -- it makes an odd boiling/groaning sound as it's dissolving; this is normal.

6. When the lye-water is completely mixed and clear, it will be about 180 degrees, the proper temperature for hot-process soap. Slowly add lye water into your oils.
Wear your goggles and gloves! Using the immersion blender as a spoon (don't turn it on), stir the solution to blend the lye water into the oils.
7. Set the emptied lye-water pitcher aside in a safe place (to clean later).
8. While stirring with the immersion blender, turn it on in short bursts, 3 - 5 seconds each, and stirring with it 'off' in between. At first it will want to separate; just keep blending, in bursts.
9. Keep up the short bursts until the mixture is thoroughly blended, a condition called "trace." This is a point of no return--your soap will not go back to being oil and lye. "Trace" for liquid soap looks much like that for bar soap - rather like pudding or applesauce. When you think you've reached "trace," stir it a bit longer, just in case.
 - ★ To test for trace: dip a spatula or spoon into the mix and dribble a bit of it back into the pot. If it leaves a little "trace" behind, you're there. That is, a little mound of soap takes a second or two to disappear back into the mix. It may not be very thick, just well mixed with no streaks of remaining oil. It will thicken with time.
 - ★ You will need a lot of **patience** at this step, because, depending on the mixture of oils, it can take a long time to get to trace, as much as 30 minutes (just think how long it might take if had to stir with a spoon--hours!)

Cook the Paste

10. You'll also need a lot of patience once it has reached trace, to cook the paste. Give it one more good stir, shake off your blender, put the lid on the pot, and start waiting. It will take about 3 - 4 hours for the soap to cook to a translucent paste.
11. While the paste is cooking, clean up your pitchers and tools in warm soapy water.
Wear your goggles and gloves!
12. Check soap in about 15 minutes. If there's any separation, just stir it together and put the lid back on. Keep checking every 20-30 minutes, stirring as necessary. While checking and stirring, you will note the stuff goes through several stages (sometimes one or more stage may be skipped):
 - Thick applesauce
 - Cooked custard with small bubbles
 - Watery mashed potatoes
 - Solid taffy that is difficult to stir--use the potato masher to break up the taffy
 - Chunky/creamy vaseline
 - Translucent vaseline

Test for Doneness

13. When mixture has softened and turned translucent, make this test:

Measure 2 oz boiling water in 1-cup glass measuring cup. Add 1 oz of soap paste. Stir to break up soap and help it dissolve in the water. When completely dissolved, check for clearness.

- If it's totally clear or only very lightly cloudy, that's OK (light cloudiness could just be your combination of oils; and the soap may settle after it cools and get even clearer).
- However, if it is milky or very cloudy, it either needs more cooking, or you made an error in your measurements somewhere.

If test mixture stays clear as it cools, it's done cooking, but you still need to muster your patience.

Dilute the Paste

14. Bring your 40 oz water (for diluting) to a boil, then add to soap paste in the crock pot. Stir a bit with a spoon or potato masher.

15. Put lid on the crock pot and turn off the heat. Wait about an hour, then stir some more. It should have softened considerably, but may still be very chunky and gooeey. Put lid back on and wait some more. Keep waiting and stirring, waiting and stirring, each hour until it is all soft and uniform. If you plan it right, you can just go to bed, then check it in the morning.

16. For more information on diluting your soap, use the handy Liquid Soap Dilution Reference Table on Candle and Soap's website (reference 8 at end of this article).

Neutralize the Soap

Remember that liquid soaps are designed to have an excess of lye, to ensure all the fats/oils are saponified. Since you don't want this lye to remain in the soap, you neutralize it by adding boric acid (or borax).

17. Turn crock pot back on (low setting), and heat mixture to 180 degrees or so.

18. Bring a little more than a cup of water to a boil. In a 2-cup glass measuring cup, mix your neutralizing solution:

- for boric acid, add 2 oz boric acid crystals to 8 oz boiling water;
- for borax, add 3 oz. borax in 6 oz boiling water

19. Stir very well, making sure it stays very hot (near boiling), but don't heat it on the stove (you can set it over a pilot light). Just work fast so it doesn't cool. The crystals will start to precipitate if the mixture cools too much, and it won't mix into your soap!

20. Slowly pour only 2 oz of the neutralizer solution into the re-heated soap mixture, stirring well. [The rule is about 3/4 oz neutralizing solution per pound of paste; round down to the nearest whole oz of neutralizing solution. This recipe has about 2.8 lb of paste, which means 2.1 oz., rounded down to 2 oz, of neutralizing solution. Too much neutralizer can result in a cloudy soap, so better to err on the conservative side.]

21. Now you can add fragrance and/or coloring to your soap while it is still warm, stirring to blend well.. For this recipe, about 3 oz of fragrance works well. The soap is naturally a light amber color, so take this into consideration if you choose to add color, and add your colorant a few drops at a time, stirring well.

Sequester (Rest) the Soap

22. Allow the mixture to cool, then pour it into large bottles or jars. Set aside in a cool place and let it rest. Insoluble particles should settle to the bottom; minor cloudiness from added fragrance oils should also clear up.
23. After the resting period, pour into final bottles, leaving the milky bottom layer behind.

Making the Lye Solution

The most popular brand of lye, Red Devil, is no longer actually lye and SHOULD NOT BE USED. It has been altered to discourage meth manufacture, which requires real lye. You will have to shop around for real lye.

1. Place tall pitcher on scale and zero-out the weight. Pour in distilled water to desired weight; set pitcher aside.
2. **Wear your goggles and gloves!** Place Mason jar on scale and zero-out the weight. Carefully shake lye into jar until it measures the calculated amount. Immediately close lye container and put away in a safe place.
3. Carefully and slowly, pour measured lye into the water (never the other way around--never add water to lye or it will explode and you will be badly burned).
4. Gently stir mixture, using a stainless steel stirrer. The mixture will start to get quite hot (over 200 degrees F) and may even bubble. Continue gently stirring until all lye is thoroughly mixed.
5. Proceed with soap recipe (add lye-water to fats/oils).

Sources:

1. <http://www.cleaning101.com/sdalatest/html/soapchemistry1.htm>
2. <http://www.cleaning101.com/sdalatest/html/soapchemistry2.htm>
3. <http://candleandsoap.about.com/od/soaprecipes/a/castrecipe.htm> (see recipes 1, 2, 3, and 4)
4. <http://millersoap.com/castile.html#FavCastile>
5. http://www.associatedcontent.com/article/208664/homemade_skin_care_recipes_liquid_castile.html
6. <http://www.summerbeemeadow.com/>
7. <http://candleandsoap.about.com/od/liquidsoap/ss/basicliquidsoap.htm>
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