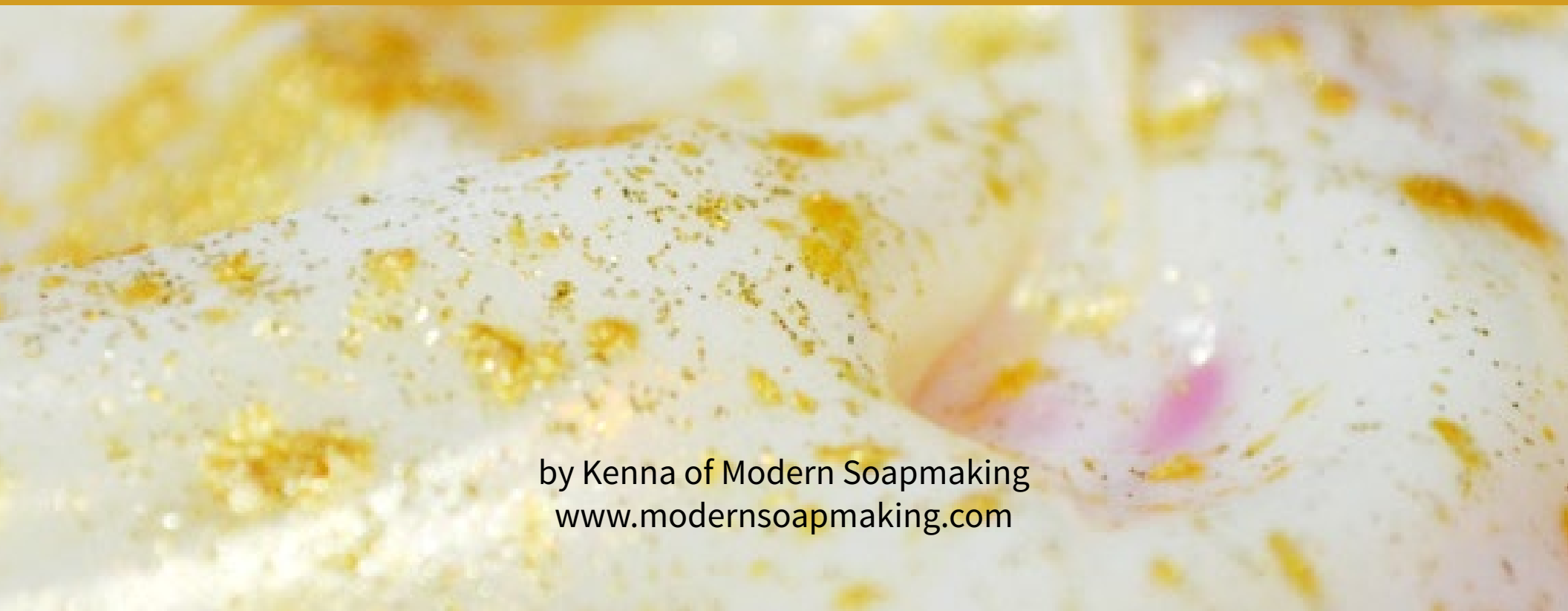
Pure Gold: Tips & Tricks

to help you master the art of

Cold Process Soapmaking



by Kenna of Modern Soapmaking
www.modernsoapmaking.com

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Pure (Soapy) Gold

a compilation of my favorite soapmaking tips & tricks

POURING FRAGRANCE & ESSENTIAL OILS WITHOUT SPILLING A DROP

There is NOTHING more disappointing then opening that pristine bottle of essential oil that costs an arm and a leg (*or maybe it didn't!*), and having it dribble down the side of the bottle as you try to pour it.

Use a skewer or stirring stick to pour the essential oil without spilling.

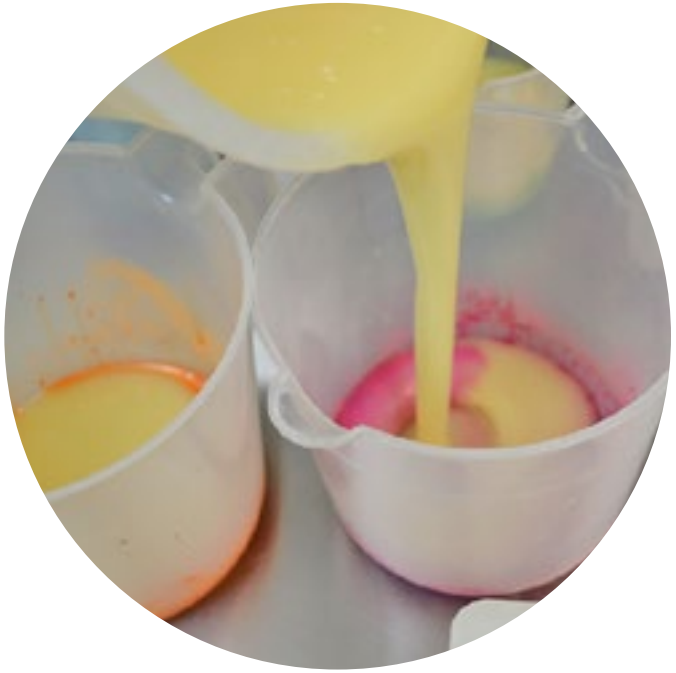
Hold the skewer straight across the top of the bottle, and slowly tip the bottle with the skewer directly perpendicular to your work surface.

The essential oil will travel down the skewer instead of grabbing a hold of the opening of the bottle, which is what causes it to dribble down the side as you pour.

This little trick is especially helpful when the essential oil or fragrance oil is brand new, as the bottle is typically full!

As an alternative, these nifty pour spouts make pouring a breeze. Bramble Berry carries them to fit their 8 and 16 oz bottles, but you can also check restaurant supply stores. If you choose to use these on your essential oils, purchase the covers or remove the pour spouts and recap your essential oils between uses. Oxygen is not your friend!

KEEP THE COLORANT SPECKLES AT BAY



That moment that you slice into a beautiful loaf of soap to find... speckles of unmixed colorants. Ugh!

Premix your colorants with oil, water, or glycerin. I prefer to use oil to mix my colorants, and use a teaspoon of oil directly from my soaping oils for every 1/2 teaspoon of colorant. I like to premix in the same container I plan on using for a portion of the soap, it makes it easier to incorporate into the soap, plus eases clean up!

The type of dispersing agent you need to use depends on the colorant. Most cosmetic micas are soluble in both water and oil. However, if you are using pigments, you'll want to use **o**il for **o**xides and **water**/glycerin for ultra**marine**s. You'll notice I bolded a bit of that, 'o' is for oil (oxides!), and 'water' is for marine life (ultramarines!)

Having a hard time getting your colorants to premix? Invest in a handy dandy frother. My favorite is the Bonjour Mini Frother, it's far more durable than its IKEA counterpart. I've dropped mine on my concrete workshop floor dozens of times, and it still works great!

MAKE QUICK WORK OF HARD OILS + BUTTERS

Hard oils and butters like palm kernel oil and cocoa butter can be such a pain to handle due to their brittle nature.

If you have a block of hard oils, like the eight pound bag in a box of palm kernel oil or a brick of cocoa butter, you can easily break it up by using a chocolate chipper (*pictured to the right*) and a rubber mallet. Remember to place the block of hard oils on a cutting board or other stable hard surface!

If you have a bucket of hard oils, use a paring knife to chunk the oils out of the bucket. Don't aim straight down into the bucket; instead, angle the knife towards the bucket walls. This video from *Majestic Mountain Sage* illustrates this technique extremely well: *http://www.youtube.com/watch?v=uP8jxnup0IM*

If your hard oils come in a plastic HDPE jug, you can place the jug in a sink of hot water to melt it. However, I like to transfer hard oils from these containers to buckets. I use a box knife to slice the jug is half around the middle, the hard oils just pop right out! From there, I use a chocolate chipper to break it up and store it in a HDPE bucket with a lid. Much easier!

THE LOVE/HATE RELATIONSHIP WITH MOLDS

The adorable plastic molds available for chocolate, candy, and melt and pour soap are so difficult to pass up for cold process soap - so, don't pass them up!

Spray plastic or HDPE molds with mineral oil, cyclomethicone, or dimethicone and cold process soap will pop right out. With both plastic and silicone molds, it's helpful to use sodium lactate in your soap formula for easy release. (*Use 1 tsp per pound of oils!*)

You can also freeze the soap in plastic molds for an hour or so, and then run hot water over the back of the mold. This works for PVC pipe molds, too!

Speaking of PVC molds, did you know you could use a wine bottle or 16 oz. amber glass bottle as a pusher? Insert the flat bottom of the bottle against the soap in the PVC pipe, and use a table to push!

Using wood molds and tired of lining them with freezer paper? Try an alternative lining method. Quilter's mylar plastic works well to line molds, as does corrugated plastic sign material and super thin cheap trash bags. If you use the plastic sheets, use tape to seal the pieces together. Easy peasy!

CREATE A SYSTEM OF CHECKS AND BALANCES

Do you know how much your favorite soap pot weighs? How about your favorite mold?

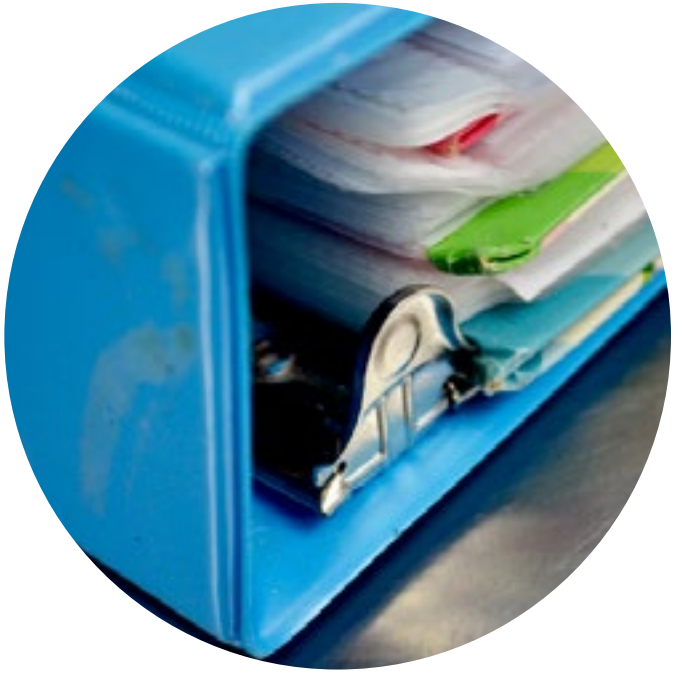
It's time to find out! I highly recommend weighing each container you use in soapmaking and keeping a list handy. If you forget to tare your scale, it's as easy as checking your list and subtracting the weight of the container.

Knowing the weight of your molds also makes it possible to weigh a finished batch, and determine if you are missing an oil.

I can't count the number of times I've looked at a batch in the mold and wondered why it looked less full than it should be. After weighing the mold and doing a little math, I can pinpoint what exactly is going on.

Since we're talking about weights, here's another quick tip: place your scale that you use in soapmaking inside a plastic zip top bag. This will keep your scale in pristine condition, and make it easy to clean up! Looking for a scale? My favorite is the MyWeigh KD 8000 Baker's Scale.

GET ORGANIZED IN STYLE

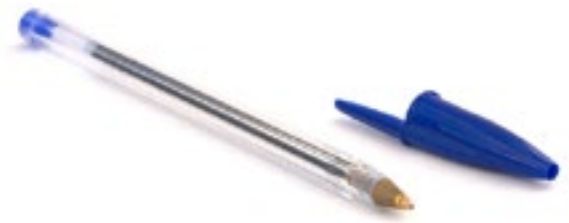


It's always a good idea to keep both digital and paper copies of your favorite soap formulas.

I keep multiple three ring binders in the soap workshop. One binder is designated for Material Safety Data Sheets (MSDS), which should always be within reach in case of emergenices. You can obtain MSDS for your ingredients from your supplier.

My formula books keep all my soap recipes in tip-top shape, with each formula safe from oil and raw soap splatters with a plastic sheet protector. As each ingredient is weighed, I can check it off with a dry erase marker on the sheet protector. When I'm finished making soap, I wipe off the sheet and place it back in it's binder. Perfection!

My binders all have blank pieces of paper to take notes, too! It's a good idea to get in the practice of making notes about your soapmaking so you can repeat your successes and learn from your failures.



FLOW WITH YOUR SOAP MAKING

To make the most of your soapmaking, it's best to find your flow and stick with it.

Personally, I like to prep everything before I get started. Here's the order in which I flow:

- Make my lye solution (or weigh my premixed lye solution)
- Weigh and melt my soaping oils (or weigh my masterbatched oils)
- Weigh and add my fragrance to my soaping oils (so I can't forget to add it later)
- Measure and premix my colorants (in measuring cups big enough for the soap to be added)
- Clean my work surface (because I'm messy and always spill something)
- Lay out my ingredients for the batch to my left, and my mold or any swirling/texturing tools to the right
- As each ingredient is added to the soap pot, I move the empty container to the right (so when I'm all done, there should be nothing to the left)

Voila! A soapmaking session I can really dig! *How do you flow?*

EVERYTHING HAS A HOME

When I'm making soap, I always keep a tall plastic pitcher half filled with distilled water nearby.

This handy dandy pitcher serves two purposes:

- It gives me a place to put the bell of my stickblender when I'm not using it.
- It allows me to clean my stickblender between batches without running off to the sink.

After I use my stickblender, I place it in the pitcher and turn it on for a few seconds. This cleans off the bell from any residual raw soap.

Then, I disconnect the bell of my stickblender from the motor. When I need to use my stickblender again, I place the motor back on the bell and get to work.

Always, always, *always* disconnect the bell of your stickblender from the motor - OR - unplug your stickblender when cleaning it. I've known many soapmakers who have skipped this step and accidentally blended their own fingers. *Not pretty!*

THE PART EVERYONE HATES

I'm pretty crunchy granola when it comes to the environment, so I don't like to use disposable things in my soapmaking.

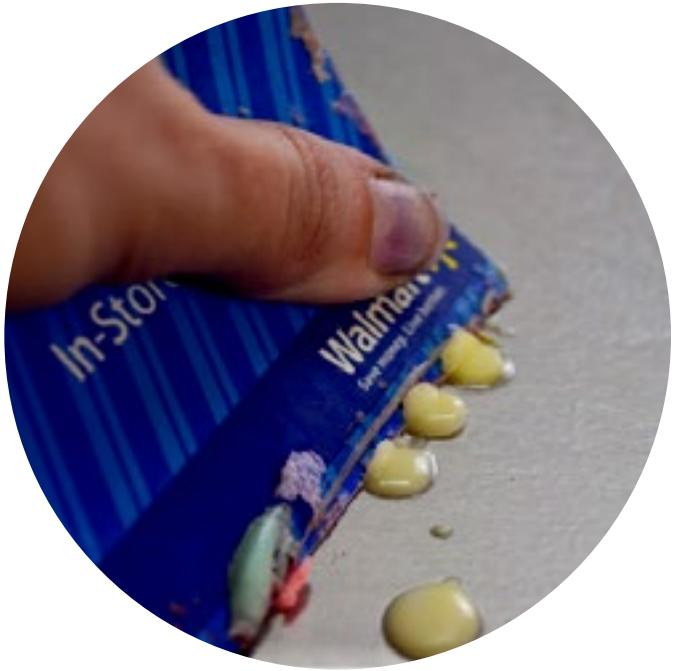
A lot of soapmakers use disposable cups for mixing colorants and for holding portions of soap for swirling. Others will use paper towels for clean up. If that's you, that's perfectly fine!

If you are wondering how you can green yourself up, start using washable containers for your soap dishes. This is another reason I use measuring cups to premix my colorants. I split my soap for swirls into the measuring cups; it makes it easier to clean the measuring cups out later!

I use old towels and rags to wipe off spatulas, soap buckets, or my work surface. After a few days, the soap saponifies and I toss them in the laundry. If you decide to try this out, I recommend washing your soap towels with other towels, using hot water and little to no detergent (it's soap after all!)

Speaking of laundry, if you get a little oil on your shirt or apron, I have a little tip for you! Toss some Polysorbate 20 or Polysorbate 80 on the soon-to-be stain and launder like normal. It will be all clean when it comes out of the wash! *(You can try this on old stains, but the heat of the dryer usually sets them in.)*

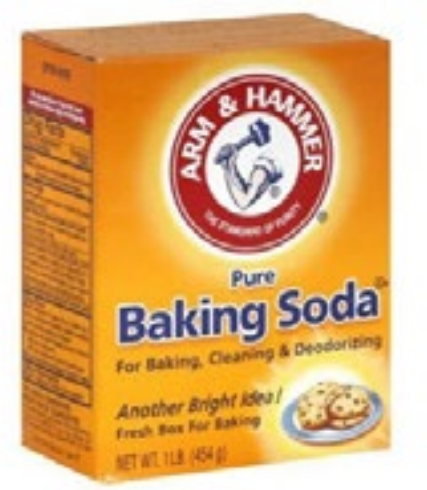
KEEPING IT CLEAN



When I'm done making soap, I use an old plastic gift card as a bench scraper to clean up any spilled soap.

I let my soap dishes sit for at least twenty four hours, so that I'm not dealing with a greasy caustic mess.

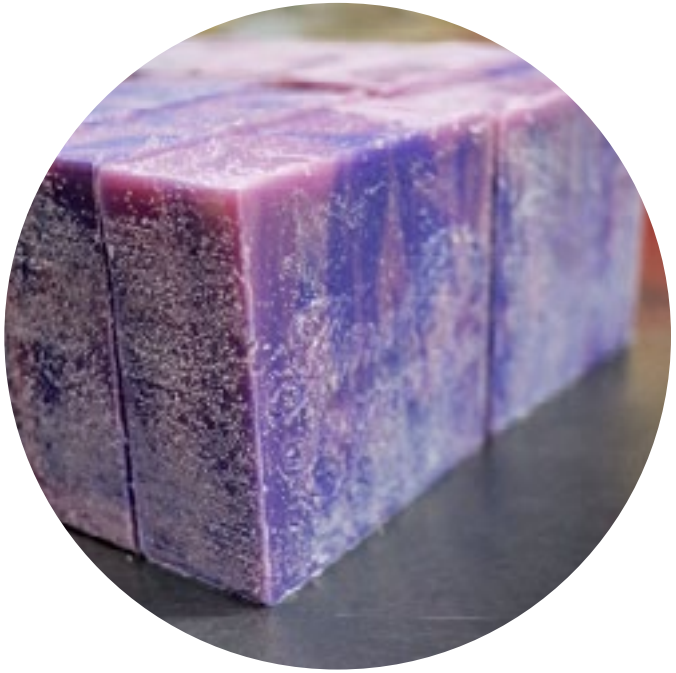
Once the leftover soap in the buckets is done saponifying, I use my trusty plastic card to scrape out any leftover soap. Then, I soak my soap dishes in hot water for awhile and then rinse them off. No scrubbing, and no raw soap to deal with!



SPILL OIL OR ESSENTIAL OIL IN YOUR WORKSHOP?

Kitty litter and baking soda are your best friends. For oil spills, use cheap generic clay cat litter and pour enough on to soak up the excess oil. For essential oil or fragrance oil spills, use baking soda. Allow the material to soak up, and then sweep up the spill. Wipe clean with a grease cutter like 100% coconut oil soap with orange terpenes or a little rubbing alcohol.

ASH, ASH, GO AWAY

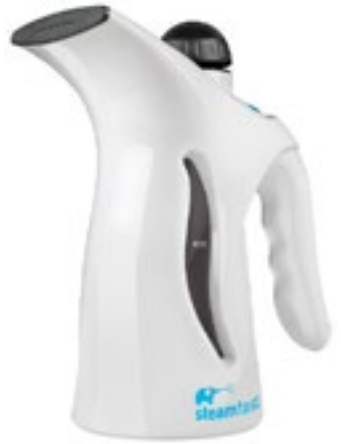


If your soap looks like it was sprinkled with snow, you've encountered one of the absolute banes of soapmakers' existence: soda ash.

Soda ash is caused primarily by any free sodium in sodium hydroxide interacting with oxygen, various fragrance constituents, and even heat, which forms sodium carbonate on the surface of the soap as it comes in contact with the air. It's entirely harmless, but not what the soapmaker ordered.

To help avoid ash, spritz the top of your soap with 91% Isopropyl Alcohol (or rubbing alcohol) when the raw soap looses the glossy appearance. It also helps to cover the soap to reduce air flow (plus covering the soap helps insulate it!)

Still dealing with ash after cure? There are two fabulous methods for dispelling ash on soap. The first is shining up the bar by dipping it in distilled water and polishing it with a microfiber cloth. The second is much quicker, but requires a little wiggle room in the budget by purchasing a compact fabric steamer. Use the fabric steamer to steam off the ash!



THE THREE R'S: RECYCLE, REUSE, REPURPOSE

As often as possible, I like to put the three R's to use.

Amber glass bottles are the perfect example. I reuse these for custom in-house blends and oil storage after cleaning them out.

The best way to clean them out:

- Fill the bottle a quarter of the way full with coarse ground salt, and add a little warm water.
- Close the bottle securely, and shake it vigorously.
- Empty the bottle (I like to strain the salt and then leave it in a dish in my office to scent the room!)
- Fill the bottle a quarter of the way full with 91% Isopropyl Alcohol (Rubbing Alcohol), close the bottle, and shake. This will snag any residual fragrance or essential oil, and clean the inside of the bottle.

Reuse the bottle for another blend! Do **not** reuse the bottle for food or medicine. **Containers that have been used for soapmaking or ingredients should only be used as such!**

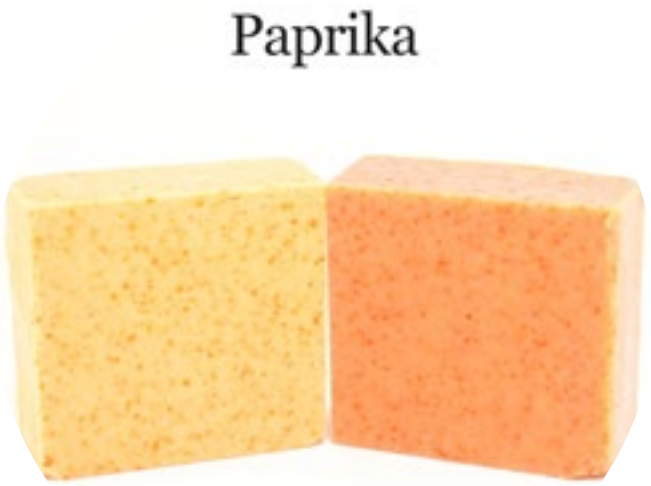
Not interested in reusing the bottle? They're recyclable! Here in Kansas City, Ripple Glass recyles amber glass into beer bottles for a local brewery, Boulevard Brewery. Check locally for a glass recycling center!

“But what’s worth more than gold?

Practically everything.
You, for example. Gold is heavy.
Your weight in gold is not very much gold at all.
Aren’t you worth more than that?”

terry pratchett

EXTENDED: ALL ABOUT THAT GEL



Saponification is an exothermic chemical reaction, which means heat is created by the process. Certain factors in soapmaking can increase the heat, and cause the soap to enter a temperature phase we all lovingly know as “gel phase.”

Gel phase isn’t required for soapmaking to be successful, and it makes very little quality difference in the final soap. (Some soapmakers say they can’t even tell, while others feel there is a slight difference to the soap’s texture.)

What it does affect is how quickly saponification completes (within 12 to 24 hours!), and how transparent the final soap is (which affects how colorants look).

(*In the Paprika soap above, the left is ungelled and the right is gelled.*)

Gelled soap is far more transparent than ungelled soap, which means soaps made with herbs or other chunky additives can be more easily seen in the final soap. Soaps made with pigments are brighter when gelled as the transparency of the soap allows more light to refract off colorant particles. However, the high temperature of gelled soap can also cause certain colorants to change - this is most commonly found with natural colorants.

Here are some factors that act as catalysts for saponification, and improve chances for gel:

- Higher initial temperature of soapmaking oils and lye solution
- Using full water in a soap formula (25% to 28% lye concentration)
- Using fragrances that heat up - spicy, ozone, and floral notes usually
- Using additives or water replacement liquids that contain sugar
- Insulating the soap in the mold
- Warm ambient room temperature

So, **if you want to avoid gel,** try lowering your initial temps, discounting your water, using a mold that doesn't insulate well (silicone and thin plastic), or lowering the ambient room temperature (place your soap in the fridge or freezer!)

If you want to encourage gel, raise your initial temps, don't use a water discount, use a mold that insulates well (wood is the best), or raise the ambient room temperature (CPOP!)

I personally prefer gelled soaps, so while I do use a significant water discount (40% to 50% lye concentration), I either insulate my soap really well using a couple yards of wool felt (it works better than any other fabric I've tried!) or by cold process oven process.

When I CPOP, I place my soap in the oven at 170 degrees F for 15 to 30 minutes, and then turn the oven off and keep the soap inside until saponification is complete (no opening the door so the heat stays inside!)

Another hint: Use a heating pad or seedling heat mat under the mold to encourage gel. ;)

EXTENDED: MIXING IT UP WITH ALTERNATIVE LIQUIDS

Water replacement is commonly used to incorporate other liquids into soapmaking instead of water.

The important thing to remember when it comes to soapmaking is that water is a carrier for the sodium hydroxide (lye) to complete the chemical reaction (saponification). Once it's done it's job, the excess water in a formula evaporates out during cure.

When you use an alternative liquid, there is still water in the liquid that evaporates out but it can affect how the soap performs. Some soapmakers believe that some additives carry extra skin nutrients that make soap better for the skin, (the jury is out on that scientifically!)

The most common form of water replacement is using goat's milk or other milks in place of the water. The biggest problem soapmakers encounter when using milks is that the sugars and proteins in these heat up and caramelize during saponification, which affects the final color of the soap (to a light to dark tan, rather than creamy off-white.)

There are two ways to combat this: freeze your liquids before creating your lye solution, or using the water replacement liquids in a dual phase process.

Freezing the Liquids: If you want to use a 100% water replacement in a formula, you would calculate your formula as normal with a lye calculator such as Soap Calc and then replace the full water weight with anoth-

er liquid.

If using goat's milk, you would freeze the full weight of what would be water in goat's milk. And then slowly add the lye to the frozen goat's milk, allowing the exothermic reaction to melt the goat's milk. Stir the slush as you slowly add more lye until you have fully created your solution. The frozen liquid will help keep the temperatures of the fresh lye solution lower to prevent some (but not all) caramelizing of the sugars.

Dual phase process: This method is the most effective way to avoid discoloration due to water replacement liquids (outside of avoiding gel) and also allows you to masterbatch your lye solution or purchase premade 50% solution.

Since the water in any formula is the carrier for the lye and the strongest lye solution that can be used is a 50% solution (1:1 water to lye ratio), this method involves using a 50% solution with water and lye, and using the remainder of the potential water portion as an additive in the oils or at trace.

You would calculate your recipe as normal, let's say for a formula the lye calculator tells you to use 5 ounces of lye and 10 ounces of water. You would make your lye solution with 5 ounces of lye and 5 ounces of water (50% solution - equal parts lye and water.) And then subtract the amount of water you used from the formula's water amount (10 ounces of water called for in the recipe - 5 ounces of water used in the lye solution = 5 ounces of remaining water), and use that for the water replacement liquid (5 ounces of goat's milk, aloe vera juice, or whatever you want!)

I like to add this excess water portion into my oils before mixing the lye solution and oils together, but it can

also be added at trace (if added at trace, it will initially accelerate the formula.) This prevents the high temperatures of making the lye solution from affecting the liquid added for water replacement. However, when the lye solution and the oils come in contact, there will be slightly more heat created - so it's smart to soap cooler than normal!

No matter the method or the water replacement liquids, some minimal discoloration should be expected. Remember to take this into account when choosing your colorants! If you use frozen goat's milk, for example, a pretty pink mica will likely look dark and gain some tan undertones (looking more red, orange, or brown.)

If you choose not to use either of the methods above, and simply plan on replacing your water with another liquid, keep in mind that:

- Liquids should always be chilled or room temperature. If you use a hot liquid, it will compound the reaction of adding lye and cause a massive lye volcano. (Not recommended! Very dangerous!)
- Carbonated liquids should always be flat. Again, carbonation will compound the reaction and create a volcano! (For example, store the carbonated liquid in the fridge with the lid off or boil it.)
- Avoid insulating any soap that contains a liquid high in sugar or alcohol, and be prepared for mild to heavy acceleration. (High amounts of sugar and heat can actually cause the soap to separate in the mold!)
- Use a container that can hold at least double the volume of your lye solution, and make any lye solution with new liquids in a sink or other vessel that can catch a volcano.

EXTENDED: SLOOOOOOOWW MOVERS

Once upon a time, I wrote about the secret to the absolutely best soapmaking recipe (is that how you found Modern Soapmaking?!) and it is probably the main reason I get requests for this topic.

It's important to understand that there are huge variety of factors that affect how quickly a soap recipe moves:

- The base oils in the formula itself
- The temperature of soapmaking
- The temperature of the room
- The speed and amount of mixing
- The amount of water in the recipe
- The presence of catalysts

For some reason, fatty acid profiles are not commonly taught in soapmaking 101 type books and classes, and I think this is a huge misstep. Understanding the fatty acids in your soap formula's base oils can go a long way for formulating and controlling recipes.

I do want to point out an easy way determine how quickly a formula will move when looking at the fatty acid profile (which can be found on Soap Calc or in Soapmaker 3):

The higher the percentage of unsaturated fats vs. saturated fats in any cold process soap formula there are,

the slower it will trace. For example, 100% olive oil soap is the slowest dang thing ever. It's fatty acid profile is 17% saturated fats, 83% unsaturated fats. Most formulas fall around 30% to 45% saturated fats, but if the saturated fats are higher than 50%, you know to expect faster trace times (and even faster trace the higher it is.)

Another common factor in oils that you may be unaware of when it comes to base oils is adulteration. I always recommend purchasing soapmaking oils from reputable suppliers, as many grocery store oils are adulterated. This may mean that they contain other oils (blended) or other additives, which makes them unsuitable for soapmaking.

The temperatures in both the soapmaking ingredients and the room temperature in which you are making soap can affect how quickly a soap traces. The higher the temperatures, the faster the trace times.

Now, here's a little note, if you get too low on your temperatures, you may encounter false trace. This isn't really trace at all, even though it looks like it's grainy cousin. It's caused by some of the fatty acids beginning saponification before the rest of the formula does. As it heats up (remember, saponification creates heat!), it will loosen back up as the lye redistributes among all the fatty acids. If you encounter false trace, keep stirring!

When it comes to the amount and speed of mixing, I'm pretty infamously known for telling soapmakers to put down their stickblenders, and have been known to advise soapmakers who have never handstirred a batch to give it a go. The reason for this is because most modern soap makers have become dependent on

this little power tool and are usually using it too much. If you've ever watched one of my videos, you'll see me stickblend for minimal amounts of time - anywhere from 15 seconds to a minute. That's it. ;)

The amount of water in a formula also affects how quickly soap traces. The higher the water discount, the faster it will trace. (However, the higher the water discount, the lower the temperature during saponification will be, which often results in partial gel!)

And lastly, the biggest variable of all: catalysts. Catalysts are a wide variety of additives that can be added in soapmaking that can increase how quickly the soap traces. They include (but are not limited to!):

- Some fragrances and essential oils (usually those with spicy, floral, or ozone notes)
- Some water replacement liquids (usually those containing alcohol or sugars)
- Some colorants (these vary far and wide, but the most common that I have had issues with are orange/pink/red colorants, and FD&C dyes)

So if you want to work with a slow moving recipe, those are alllll the factors you need to look at and take control of. It's very recipe specific, so apply what you need to your formula. ;)

EXTENDED: CURE IT OUT

A lot of the older soapmaking books and teaching methods miss the boat on defining cure and saponification. It's a common misconception that cold process soap *has to* cure for four to six weeks. BOOM, did you know that's a myth?!

While a nice long curing period does create a harder and longer lasting bar, it's not necessary for soap to be... well, soap. Saponification itself is generally complete within the first 12 to 48 hours of making the soap. Now, if a soap didn't gel or was created at extremely low temperatures, it can take a little longer, but even then, it's usually a max of two weeks.

So, why is a curing period recommended? If you remember, the water in a formula is a carrier for delivering the sodium hydroxide (lye) to the fatty acids (oils) in order to create soap. After the water has served it's purpose, it's just hanging out... making the soap soft and mushy.

If a soap is used straight away, the excess water in the bar makes the soap itself wear down quicker (more soap is used by the mechanical friction of hand/body washing.) If a soap is allowed to cure, the excess water evaporates out of the bar.

A little tangent for ya: did you know the Hardness number in Soap Calc is actually a better indicator as to how durable a bar is vs. it's physical hardness? Take, for example, 100% olive oil soap. If it's allowed to cure, olive oil soap is actually brick hard. However, it's super soluble in water and wears away very quickly. Its hardness in Soap Calc is rated at 17. The lower the number, the faster it will wear away in usage.

The higher your water discount is, the less water there is to evaporate out of the soap. A good rule of thumb is to weigh your soap every day, and when it stops losing weight, it's pretty well cured. Most of my soap is ready after about two weeks of cure, but I typically soap with a large water discount. (Also, remember that your final soap weight without the water content is the real weight of your soap for labeling purposes if you

sell!)

It's super important to remember to cure in a low humidity environment (as your goal is to evaporate water, which can't happen if the air is full of water!). If you live in a humid area, it's a good idea to setup a dehumidifier in the same space that you cure soap. (Those little Damp Rid canisters that can be found at home improvement stores are a good alternative to a small space for a hobbyist!) High humidity can also cause DOS!

You also want to avoid curing your soap on wood or metal, as they can cause DOS (dreaded orange spots). If you use wood or metal, placing a plastic sheet or piece of parchment paper between your soap and the material will prevent issues.

Which brings me to the next curing-related tip: if you reuse a material to cure on, wash it between uses. If there is soap residue on the material, and the free oils (superfat) go rancid, it can cause DOS in new bars of soap placed on the material.

My favorite space saving curing racks are baker's racks, which bakeries use to store sheet pans on. I scored mine from a restaurant supply auction for $50. Metro shelving and IKEA shelving are also popular choices, as are stackable commercial dishwashing racks and commercial bread and bakery delivery trays. Check local restaurant supply stores, or online options like Webstaurant Store!

Looking for one of the tools or pieces of equipment mentioned in this mini-guide?

Check out my list of favorites on Modern Soapmaking by clicking on this box.

ABOUT KENNA + MODERN SOAPMAKING

In 2014, Kenna created *Modern Soapmaking,* a proverbial online playground for soapmakers, after owning and operating two successful soap companies.

With over ten years of soapmaking experience, she passes on her knowledge through resources and eBooks (which have collectively sold over 1,000 copies.)

She continues to nurture soapmakers through her own mentorship programs and workshops, as well as through industry events and publications. She also hosts the annual *Central Soapers Workshop*, a conference for soapmakers in the Midwest region.

Even though it appears that she eats, sleeps, and breathes soapmaking, she sets aside plenty of time to indulge in photography, MMORPGs (video games!), and her amazingly supportive family, including her three little ones under the age of six.

If you catch one of her soapmaking videos on *YouTube*, you'll snag a listen to some of her favorite electronic music while seeing her in her element: working at 3 am with caffeine in hand.