

# The Essentialist

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## Working with Lye

There are two forms of lye used in soap making: Sodium Hydroxide (NaOH, common lye), used for making bar soaps; and Potassium Hydroxide (KOH), used for making liquid soaps. Both forms are extremely caustic and require extra care.

## Safety Precautions

**Lye is extremely caustic & dangerous; take care, and follow these precautions:**

- ✓ Store bottles of lye crystals out of reach of children and pets;
- ✓ Ensure the bottles are clearly labeled as caustic poison;
- ✓ 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.

OK, now that you are too scared to begin, take a deep breath and relax. It really isn't that bad as long as you are careful and wear protection.

## Calculating Amount of Lye for your Recipe

Each fat or oil has a different fatty acid profile, and thus provides different characteristics to the resultant soap. They also have different molecular weights, and require different amounts of lye to fully saponify them. Therefore it is very important to calculate the correct amount of lye each time you modify a recipe.

You can also use more oil than required for the amount of lye, to express the properties of a particular oil in the soap. This is called '**superfatting**.' The extra oil can be added with the other oils, to express the properties of all oils in the final product; or added after saponification is complete, to express the properties of only the selected oil.

If you're a chemist and know the average molecular weight of each fat, you can calculate the amount of lye by hand. But it is much easier and faster to use a calculator.

## Homemade Soap: Making the Lye Solution

There are many available on the web; the one provided on the [Summer Bee Meadow](#) <sup>6</sup> appears to be the simplest, and allows for superfatting.

### 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 because meth manufacture requires real lye. You will have to shop around for real lye.

#### **Equipment:**

- scale (postal scale that measures to 0.1 oz is preferred)
- Mason jar
- tall skinny pitcher for mixing lye (at least twice as tall as the measurement of water, to avoid splashing)
- long-handled spoon, for stirring the lye-water in the pitcher;

#### **Instructions:**

1. Place tall pitcher on scale and zero-out the weight. Pour in distilled water to desired amount.; set pitcher aside.
2. **Wear your goggles and gloves!** Place a Mason jar on the scale and zero-out the weight. Carefully shake lye into the jar until it weighs exact desired amount. Immediately close the lye container and put away in a safe place.
3. Carefully and slowly, pour the 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). NOTE: When cleaning the jar, use plenty of water and wear your gloves.
4. Gently stir the mixture. Use 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 the lye is thoroughly mixed.
5. Next step:
  - For **bar soap** (cold process soap): Place lid on the pitcher and set aside, out of the way and not near anything that is heat sensitive, to cool. It will be ready to use when it has cooled to about 100 degrees F. Mark the pitcher "Danger-lye solution" just to be extra safe, especially if there are others around.
  - For **liquid soap** (hot process soap): you don't need to let the lye water cool. Proceed with soap recipe (add lye-water to fats/oils).

Sources:

1. [http://candleandsoap.about.com/od/soaprecipies/a/castrecipe\\_5.htm](http://candleandsoap.about.com/od/soaprecipies/a/castrecipe_5.htm)
2. <http://candleandsoap.about.com/od/coldprocesssoapmaking/ss/ssmakelye.htm>
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