SCHOOL of NATURAL SKINCARE
International

COLD PROCESS Soapmaking

APPENDIX 2

EQUIPMENT FOR SOAPMAKING

COLD PROCESS SOAPMAKING

APPENDIX 2: EQUIPMENT FOR SOAPMAKING

In this lesson, we will cover:

1. **Where to buy your equipment.**
2. **The importance of a clean, well-organized workspace.**
3. **The equipment to consider for your home lab or for small-scale production.**

WHERE TO BUY YOUR EQUIPMENT

There are several places that you will be able to find the equipment you need. For the essentials for making small batches, the following places are useful:

- Online stores selling science lab equipment such as BetterEquipped.co.uk (UK) or www.carolina.com (USA).
- Kitchen supply stores.
- Cosmetic ingredient suppliers often also sell equipment.
- Amazon or eBay. While we do not recommend buying ingredients on eBay or Amazon, they are useful for finding equipment.
- Specialist stores, for example for weighing scales or mixers.

THE IMPORTANCE OF A CLEAN, WELL-ORGANIZED WORKSPACE

Having a clean workspace will reduce the number of errors that could occur. For example, if you have lots of raw materials placed everywhere over your workspace, you could easily use the wrong ingredient in your formula. You can also reduce the possibility of contamination occurring by ensuring your workspace is clean.

THE EQUIPMENT TO CONSIDER FOR YOUR HOME LAB OR FOR SMALL-SCALE PRODUCTION

Here is a list of the equipment that you should consider using in your home lab:

- Protective equipment (clothing, goggles, heavy-duty gloves).
- Heating equipment.
- Containers/beaker/bowls.
- A thermometer.
- A stick blender (hand-held immersion blender).
- Scales.
- Weighing boats/pipettes/watch glasses.
- Whisk/spoons/spatulas for weighing out ingredients/mixing.
- Soapmaking molds.

We will now take a look at this list in more detail.

PROTECTIVE EQUIPMENT

The first thing you will need is a protective overall or a white lab coat. This will help protect your clothes from any damage from the raw materials or even from your finished formula. Goggles are really important, to protect your eyes. Goggles will prevent particles or droplets (from raw ingredients) from getting into the eyes, and also prevent any products getting into eyes. When making soap, a highly caustic soap mixture could splash into your eyes and cause serious damage.

Heavy-duty gloves are also necessary. This is to prevent lye solution or soap mixture from coming into contact with skin and causing chemical burns. Make sure you are using long rubber gloves that cover your hands, wrists and part of your lower arms.

When making lye solution, it is a good idea to wear a face mask, so as not to inhale any of the fumes.

HEATING EQUIPMENT

You will need a source of heat in order to melt the butters and oils in your recipe.

To heat the oils, you can use a water bath or a bain-marie (double boiler) and a source of heat.

To create a bain-marie you place a glass beaker containing the butters and oils inside a saucepan containing water. Usually the beaker is placed on a trivet. Then the saucepan is placed on a heat source. You could also place one saucepan inside another; or use a double boiler insert. Depending on which method you choose, the following may be useful:

Two saucepans. To fill with water and provide the 'bath'/heat source.

At least two Pyrex jugs, heat-proof glass lab beakers or autoclavable polypropylene chemical-resistant beakers. The reason for using glass is, because glass is inert, it will not react with any raw materials and is resistant to lye. If you choose to use beakers then you will need to think about how you will handle these when they are hot. You can use special tongs or heat-proof gloves.

The size of the beakers or bowls would be dependent on the batch size you are making, so please take that into account when selecting the sizes. When creating a bain-marie, the saucepan will need to be filled with sufficient water to heat the ingredients, but it is important that it does not overflow when containers are placed into them, so you may want to do a test first.

It is also important that the beaker and the contents are heavy enough to sit in your saucepan because if it is not, the beaker will tilt and there is a possibility that your ingredients will spill out into the water in the pan.

You will need one smaller container to make the lye solution in and one larger container to melt the oils and mix the soap in.

Double boiler maker or metal trivets/rings (even a cookie cutter would work). You place the beakers on top of these items, so the beakers do not touch the bottom of the saucepan.

Double boiler insert. These are often sold as melting pots for chocolate making and sit inside a saucepan of water.

Another option to heat the oils is to place them in a heat-proof container (laboratory glass beakers; stainless steel saucepan) and heat them on a direct heat source (eg electric cooker). It is important to heat the oils on a very low temperature setting while stirring often, to avoid overheating. Check the temperature regularly and only heat long enough for the solid ingredients to melt completely.

CONTAINERS/BEAKERS/BOWLS

You will need heat resistant and chemical resistant containers to make your lye solution in, to melt the oils and to mix the soap in.

When lye solution is in contact with aluminum, it reacts to form highly flammable hydrogen gas. **Avoid all contact with aluminum**, for example, aluminum bowls and pots.

Materials suitable for soapmaking are glass (eg Pyrex bowls, laboratory beakers), stainless steel and polypropylene plastic (common kitchen mixing bowls).

You will need one smaller container to make the lye solution in and one larger container to melt the oils and mix the soap in.

A THERMOMETER

You will also require a thermometer to measure the temperature of the lye solution and of the oils.

Inexpensive glass lab thermometers are sufficient, or you may like to invest in an infrared thermometer.

STICK BLENDER/IMMERSION BLENDER

Stick blenders are used to combine lye and oils. You will require a stick blender that is long enough to reach the bottom of the bowls or the beakers. You will use this to create your emulsions. One with a stainless steel blender is easier to clean. The blender will need to be good quality. Metal ones have the advantage that they are resistant to high temperatures, but if they are not good quality, they may release ions into the product during mixing. Plastic hand blenders are more sensitive to high temperatures, so if you do use a plastic one it is important that it is of good quality.

In a professional lab a homogenizer would be used, but as these are really large and expensive pieces of equipment, at home you can use a stick blender instead.

Professional chef hand blenders are a good option. Here are two examples:

bamix® Classic

- Very powerful.
- 10000-15000rpm.

www.bamix.com/en/products/bamix-classic-eo.html

Dynamic Dynamix Stick Blender MX050

- Up to 13000rpm.
- Good for bigger batches (up to 4 liters).

www.nisbets.co.uk/dynamic-dynamix-stick-blender/cf001

www.dynamicmixers.com/en/our-products/hand-mixers-and-whisks/dynamixr-dmx-160.html

Our tutors also recommend the following blenders, though others are also suitable:

- Vremi hand blender.
- Bosch 600 watts hand blender (CleverMixx Dip & Dressing 600 W White MSM2623GGB), which has two detachable heads; one for larger batches and one for small test batches. The Bosch CleverMixx Baby also comes with a smaller head for smaller batches. (You may require an adapter for the Bosch mixers depending on where you are located.)

SCALES

Generally, the more you spend on your scales the more accurate they will be.

Consider the maximum capacity of the scales and the resolution or readability (degree to which it measures, eg 0.1g or 0.01g). You need to make sure they are accurate down to 0.1g, or less, if you require it. You also have to make sure that the scales go up to the batch size you wish to make. If you want to make a kilo, make sure your scales can actually read to a kilo.

For example, a scale that measures up to 1,200g or 2,000g with a 0.01g resolution would be very useful.

Some reliable brands of scales are:

- Vibra
- Ohaus
- Mettler
- Sartorius
- Kern

Our cosmetic scientist recommends Ohaus scales, for example Ohaus SKX2202 2200g x 0.01g.

If you need a budget option for home formulating then kitchen scales and/or jewellery scales are an option, although the accuracy varies greatly. You may like to buy calibration weights to check the accuracy of your scales before using them. You may even require two sets of scales, one for small measurements (eg between 0.01g and 250g or 500g) and one for larger measurements (up to the batch size you wish to make).

Our students and tutors recommend the following budget option scales:

Pocket jewellery scales:

- Smart Weigh SWS100 Elite Digital Pocket Scale 100 (available on Amazon).
- GDEALER Digital Pocket Kitchen Scale 0.001oz/0.01g 500g (available on Amazon).

Kitchen scales:

- Jennings CJ4000 or Jennings CJ600.
- American Weigh Scales AMW-SC-2KG Digital Pocket Scale.

Trade-approved scales

If you are going to be selling products you may need scales that have been approved for trade use for weighing the finished products before labeling and selling them. For example, in the UK you will need to comply with the Weights and Measures Act and will need trade-approved scales approved by Trading Standards.

The most accurate scales will be available from specialist weighing scale suppliers who will provide calibration certificates and instructions.

Some examples are:

www.inscale-scales.co.uk (UK)

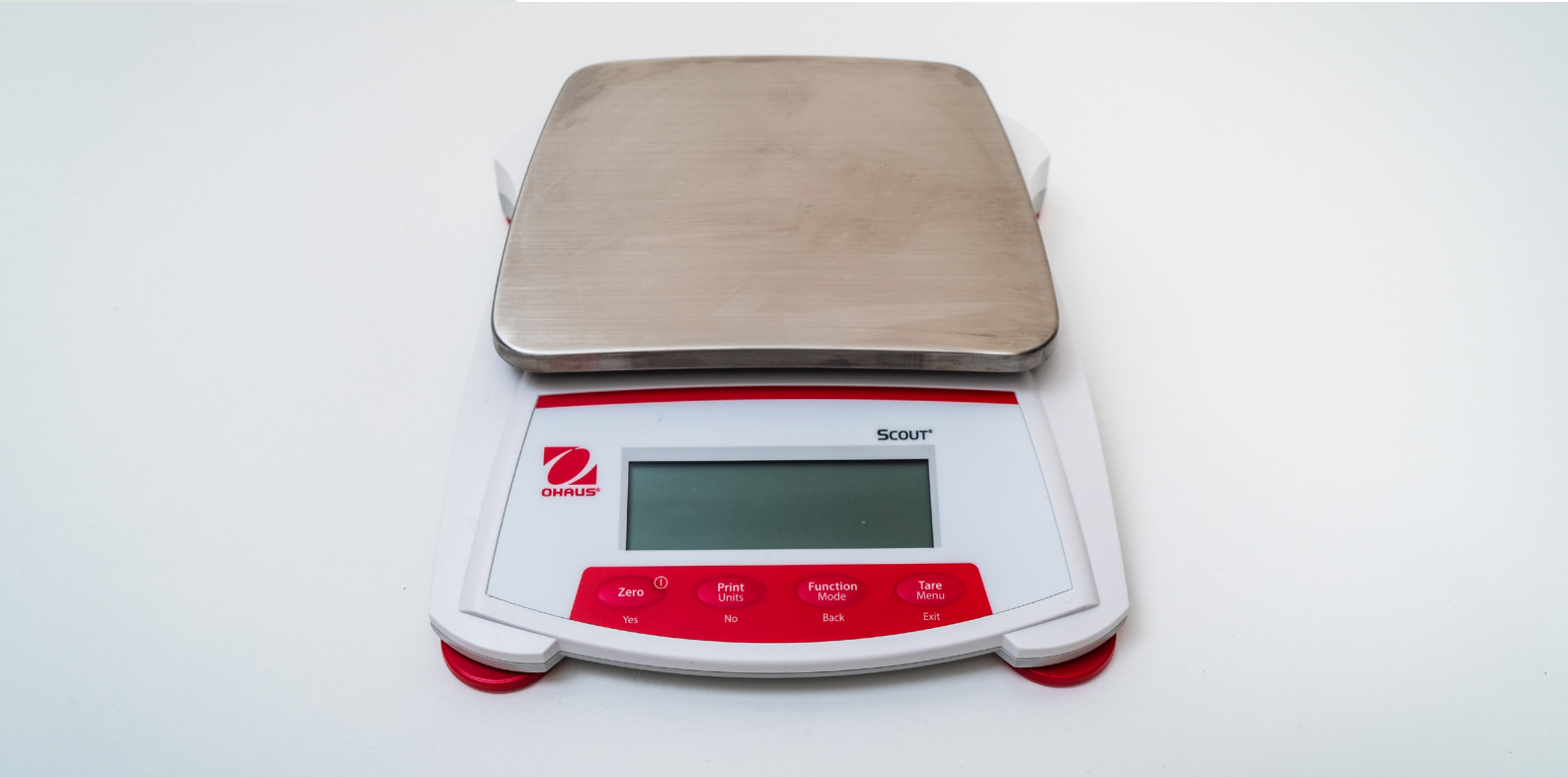
www.oakleyweigh.co.uk (UK)

www.weighingscales.com (UK)

www.csgonline.co.uk (UK)

www.andweighing.com.au (AUS)

www.balances.com (USA)



WEIGHING BOATS/PIPETTES/WATCH GLASSES

For weighing small quantities of solids or powders (eg soap colorants, clays, exfoliants), you could use weighing boats. Plastic weighing boats are disposable, so for each different powder you will use a different weighing boat to prevent contamination.

Watch glasses are very useful for weighing small quantities of powdered or solid ingredients and have the benefit of being reusable.

Pipettes are used for measuring/weighing small quantities of oils and liquid extracts. Disposable pipettes are useful from a hygiene/contamination perspective, as pipettes are extremely difficult to wash, sanitize and reuse. Every time you weigh a different liquid, you will use a different pipette to prevent contamination.

WHISK/SPOONS/SPATULAS

Even though soap is made by mixing with a stick blender, having other mixing tools on hand is a good idea. Spoons (silicone or stainless steel) are used to mix the lye while dissolving in water. Whisks are used for gently mixing the soap mixture if it is reacting too fast. Silicone spatulas are great for scraping down the soap mixture that collects on the mixing bowl.

You will also require spoons and spatulas for weighing out ingredients and mixing. Stainless steel spatulas are very useful.

SOAPMAKING MOLDS

Once your soap mixture is done, you will need to pour it into a mold where it will saponify and harden. Silicone molds are commonly used, as well as wooden molds. Silicone molds can be used as they are, without any additional preparation, while wooden molds need to be lined so the soap mixture doesn't stick to the mold. Parchment/baking paper is usually used to line wooden molds. Some wooden molds come with silicone inserts that function as lining material.

When you are just starting out, you can also use empty food cartons (eg milk or juice cartons) that have a plastic coating on the inside, as your mold.

SUMMARY

In this lesson we looked at the equipment that you will need in order to manufacture soap on a small scale at home. Most of this equipment can be purchased fairly inexpensively from lab supply or kitchen supply shops, or through online retailers such as eBay and Amazon. It is advisable to invest in good quality weighing scales and a good quality stick blender from specialist manufacturers.

Disclaimer: This publication is provided to you "as is": we have taken all reasonable care in sourcing and presenting accurate information for this publication, but do not warrant that content will be error-free. We make no representation as to its completeness, whether or not it is up-to-date, or that it will meet your requirements.

Any recipes and formulas provided to you are for demonstration purposes only, no testing has been undertaken (unless otherwise specified), and the information is presented for reporting purposes only. Some of the products and formulae described in these materials contain allergens. If you are unsure of the risks relating to these formulae or products, please consult a suitably qualified medical professional. No responsibility is accepted for any inaccuracies or mistakes in the information, or for any loss or damage that may result from its use. Your use of this publication is entirely at your own risk.

www.schoolofnaturalskincare.com