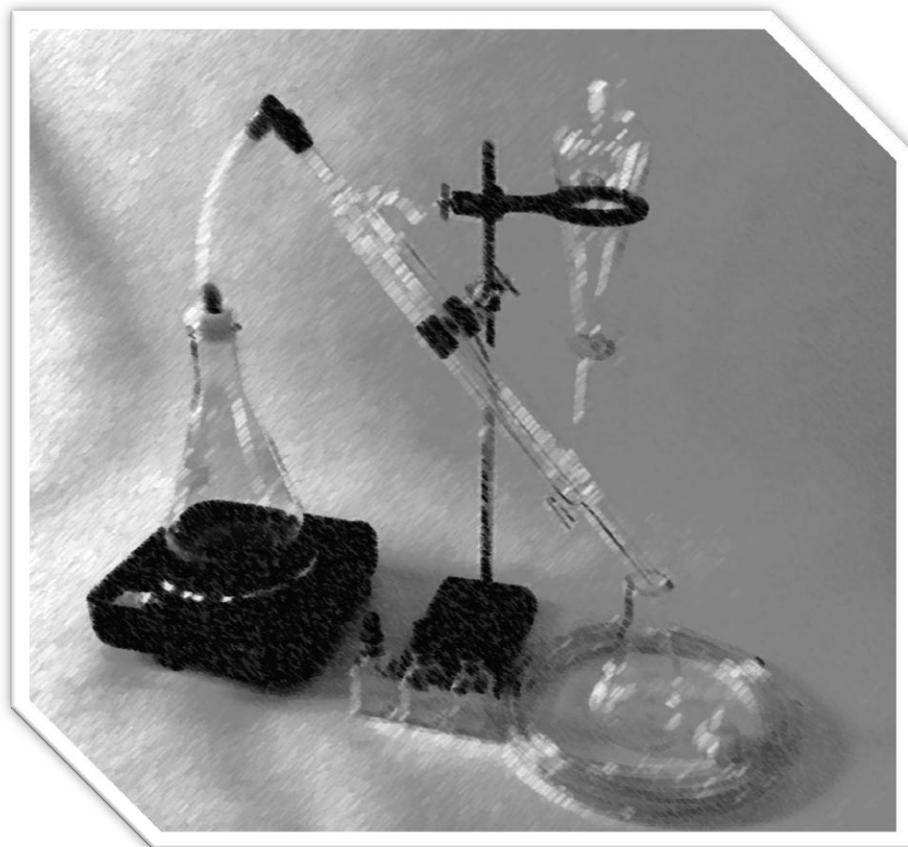
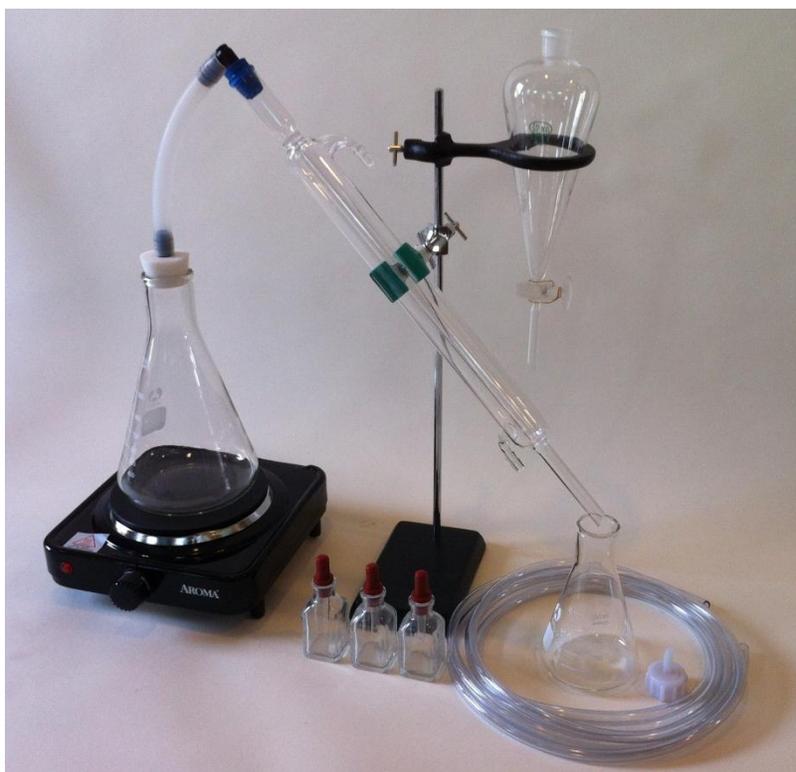

Essential Oil Distillation Kit For 1000ml and 2000ml Flask Models



Kit Illustrations

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Introduction:

Thank you for purchasing the essential oil distillation lab kit from Physics Playground. It is our goal to insure a kit that is reliable and flexible to meet the needs of our customers. This kit has been designed for at-home and laboratory use so that our customers may fluently extract the essential oils in the convenience of their desired

settings. To guide you along the way, below is a brief overview of the extraction process and how to set up your essential oil extraction kit.

Should any questions arise during the use of your product, please feel free to send us an email at frederickgraff@hotmail.com and thanks again!

How Essential Oils are Removed from a Plant:

Within all plants, there are oils that may be extracted. Common methods of extraction are cold pressing or steam distillation. Plants such as sage, thyme, or lavender may easily have their oils extracted by the use of steam distillation. Oil distillation is accomplished by passing hot steam through a plant material. Because the oil within the plants have a lower boiling point than water, the oil

within the plants will vaporize with the steam when heated. To then separate the oil and steam, the vapors are sent through a cooling process to condense the gasses into a liquid. The final product will be an oil water mixture with the essential oils floating on the top. To separate the oil and water, the mixture may be drained from below using a separating funnel.



Quick Start for Experienced Users:

Safely First:

- ❖ **When heating the system, avoid using too high of a temperature to avoid silicone corks from popping out of their glass lab ware.**
- ❖ **Never leave the distillation unit unattended.**
- ❖ **Essential oils are very corrosive and flammable. Handle the oils with care.**

Step 1: Fill the biomass container (being the 1000 ml / 2000 ml flask) with your herb of choice.
Only fill to the neck of the flask

Step 2: Pure 2 cups of water (preferably distilled) into the flask.

Step 3: Securely press the stopper into the flask and then connect the silicone tubing from the flask to the condenser. The silicone tubing will need to be cut using a pair of scissors to match your desired length.

Step 4: Connect the longer PVC tubing from the faucet hook up to the condenser and then back to the sink for draining. For best results, allow the incoming water to enter from the bottom and leave from the top. If the kit was purchased with the electric water pump, make sure the pump is placed in a large bowl with cool running water entering it.

Step 5: Turn on heat source and begin to boil the water. If the biomass and water begin shooting up the tube leading to the condenser, lower the temperature. Slow and steady is best!!! Most of the oils will be extracted within the first 10 to 15 minutes, however allow for 30 minutes to completion. For longer runs, be sure to add more water if needed.

Safety Check: If biomass seems to have shot up the tube leading to the condenser and clogged the unit, stop the distillation process and clean out the clogged area to avoid high pressures from building within the system.

Step 6: Pure the oil and water mixture into the separating funnel and drain out the hydrosol from the bottom of the separatory funnel.

Step 7: Store the essential oils only in glass containers because they will chemically react with most plastics.

1000ml / 2000 ml Flask Model

Essential Oil Distillation Set-Up

The oil distillation apparatus has three main parts to it, being the Oil extraction point where the water and biomass is located (plant material), the steam condenser, and the oil water separator. To begin assembling the still, lets first start with the condenser.

The condenser, which consists of the clear tube with the inner stainless steel tubing (new condensers are all-glass 300ml condensers), must be connected to the ring stand as seen in the illustration.



Next, connect the longer ¼ inch PVC tube from the water faucet hook-up or water pump to the bottom of the condenser and then another tube from the top of the condenser condenser back to the sink or draining location.

For those using the pump, it must be immersed in water while running. This can

be accomplished by just placing it in the sink and running water until it covers the pump. During the extraction process, to keep the water cool while passing through the condenser, you may place ice in the water which is ideal for a very hot day. The returning water may go either back to the sink that the pump is in or to another sink to be drained. If more tubing is needed, it may be purchased at most hardware stores for a very low price.



Next, you will want to connect the thicker food grade silicone tube from the 1000ml or 2000ml flask stopper to the top of the glass condenser. For this connection to be made, the other end of the silicone tubing will have to be connected to the smaller blue stopper with the black HDPE fitting and then pressed into the condenser.

Operation:

Essential oil distillation is a simple as pick it and steam it. So you will want to gather the herbs of your choice and place them directly into the flask. Next, add about 2 cups of water into the flask and then place on the stopper, however do not place the stoppers on too tight for the sake of safety. Prior to heating, turn on the water for the condenser to ensure the steam will be condensed. Next, turn on the heat until the water starts to boil and then turn down the heat so that it gently simmers. The key to oil distillation is slow and steady. You will know the heat is too high because water will try to shoot up the tube leading to the condenser. If this happens, turn down the heat. Also, keep in mind that you do not want plant material to go up the tube and clog the condenser because this will create a high pressure system and will cause the lid to pop off or even cause the plant material to shoot out which is a very explosive process. Just remember, slow and steady!

During the distillation process, the oil and water will drain off at the other end of the condenser into the small beaker. Over a course in time you will see the oil becoming more noticeable, however some plants and grades of plants will create more oils than others. The entire distillation process should take about 30 minutes with most of the oils being extracted within the first 15 minutes.

When the extraction is over, you will have a hydrosol and an essential oil mixture. Pour this mixture into it the separating funnel and allow it to settle over the course of about 10 minutes. Next, slowly drain the water from the separatory funnel until only the oil is left. The oil may now be drained into a separate vessel. The other water solution that was initially drained off is your hydrosol mixture and will retain the fragrance of the plants oil. This mixture may be used for many similar application as the oil, so be sure not to discard it.



(Lavender oil from extraction)

When your oil extraction is completed, the system should be cleaned with soap and water. Some oils may require that the stopper be boiled for a few minutes to pull out any remaining material.

Alternative Connections:

All units may be connected to a 2000 ml beaker or larger.

The 2000ml model does not need the electric heater and may be heated directly over the stove under medium to low heat. This beaker is made of Pyrex which is glass that can withstand thermal shock.

All teapot models may be upgraded to the 2000 ml units.

Oil Distillations Resources:

Below is a list of different resources in both video and website formats that would be very useful for watching in light of gather different ideas for applications of the oil distillation kit and for basic operation.

http://www.cleanvideosearch.com/media/action/yt/watch?videoId=wVi3_zkdars

<http://www.cleanvideosearch.com/media/action/yt/watch?videoId=gDojS7PWWPY>

<http://www.essential-oil-mama.com/make-your-own-essential-oil.html>

<http://www.cleanvideosearch.com/media/action/yt/watch?v=8RKIEisN3qs>

<http://www.makeessentialoils.net/>

<http://www.cleanvideosearch.com/media/action/yt/watch?videoId=Io-Gv4xeOAg>