# Decarb SOP

## Safety

1. SDS Sheets: Available upon request on all chemicals used in this process.
2. PPE: The following should be worn by all lab personnel during Ethanol extraction:
   a. Splash goggle
   b. Lab coat
   c. Gloves

## Traditional Method:

1. Select DV with a maximum capacity of at least twice the volume of oleoresin used, add magnetic Stir Bar, record Tare weight of DV.

2. A stainless-steel vessel (Bain Marie) is recommended due to its durability and higher heat transfer coefficient, however a glass beaker will also work well.

3. Fill up to one-half of the total volume of the DV with extracted oleoresin. Record Oleoresin weight with DV Tare weight subtracted.

4. Using a Controllable Heat Source (Hot Plate, Induction Cooktop), select your appropriate temperature based on time allotted.

5. Decarboxylation Times and Temperatures (Approx., While data supports these times, original composition of Oil can change time required. Continue Operation until production of small semi-stable co2 bubbles ceases).

   - 60 Minutes at 130°C
   -180 Minutes @ 110°C

   Temperatures and times for decarboxylation are reliant upon a thin film of reactant, thick solutions allow for such less efficient heat distribution and gas exchange, so thicker solutions will need more time to decarboxylate fully.

6. Set Stir function (Magnetic or Overhead Stirrer) at 240-1500 RPM to allow proper gas exchange. Lack of stirred agitation will result in boil over.

7. If a layer of tiny bubbles grows on top of the decarboxylation, use a stainless steel or glass stir rod to break up the layer.

   *Allow decarboxylation to continue until production of small semi-stable co2 bubbles ceases.

**<u>If using Vacuum</u>:** initiate vacuum to system by turning on Vacuum Pump. If -50°C or lower Cold Trap cooling is possible, full vacuum (2-20mmhg) is suitable. If these low depths of temperatures cannot be reached, regulate Vacuum at 200-350 mmhg, as to ensure full retention of fragrant compounds.

1. Initiate heating of the Mantle until Oleoresin temperature reaches 75°C, then initiate magnetic stirrer to 100-250rpm.

2. Raise mantle temperature to 100°C. Wait 15 minutes or until total oleoresin is liquid and flowing with the stir bar.

   -Note: If using Vacuum, starting with vacuum pulled on the system, a ramp from 50-75-100°C is suitable, and will help mitigate any foaming or bumping up the fractional distillation column.

3. Once oleoresin is liquid and flowing with stir bar, raise Stirrer RPM slowly until maximum RPM is achieved. Fast Stir bar revolutions are important as a vortex is needed to break up the semi-stable co2 bubbles that form as a foam on top of the oleoresin. This is especially necessary in non-vacuum operations.

4. Raise Mantle temperature to 125°C after 20 minutes to allow for a gentler distillation of the lower molecular weight volatiles, preventing degradation of the Essential Oil

5. Continue decarboxylation until cessation of small semi-stable co2 bubble production. This marks the end of the Decarboxylation.

6. Once Decarboxylation is finished, turn off heat to the mantle, and allow oleoresin temperature to lower to below 70°C.

7. If vacuum is used, turn Vacuum pump off and open system to atmosphere.

8. Disassemble system, clean off any used Joint Grease, and clean each piece of glassware except the Oil-Water Separator.

9. Remove Hydrosol from Oil-Water Separator and collect in a sealable container.

10. If a Cold Trap was utilized, remove Cold trap from coolant bath, wipe dry with a towel or cloth.

11. Remove contents of cold trap and add it to Oil-Water Separator. Rinse Cold Trap with distilled water or hydrosol and add that to the Oil-Water Separator as well.

12. Drain off Hydrosol, collect into hydrosol container.

13. Drain off Essential Oil into suitable container. Place in freezer for 24 hours to freeze any lasting H2O in the Oil. Pour Essential oil into secondary suitable container.

14.