How to make a 1L batch of concentrated nano-emulsified product using #Q700CA Sonicator with Cannasol Technologies NanoOptimizer™

Equipment list

- Q700CA sonicator
- Dry Air Cooling for Sonicator (Air Dryer with Compressor or Qsonica A/C unit)
- Electronic Balance (2,000g+ capacity)
- Beaker Set (500ml and 1000ml)
- Hot Plate (Digital Preferred)
- Overhead Mixer (2.5 - 3" Prop)
- 1L Jacketed Vessel (Glass Beaker)
- Source of Cold Tap Water (Preferred) or Chiller
- Proximity to Sink (If using tap water cooling)
- Capsule Filter and Peristaltic Pump (Preferred) or Vacuum Pump and Disposable Bottle-Top Filter Assembly (Autofil SS Series 500ml works well)
- IF USING CAPSULE FILTER: Autoclave (preferred) or 8Qt Instant Pot for Bottle/Capsule Filter Sanitization or Chemical Sanitizer Solution (70% EtOH or Peracetic Acid Solution) and 1L Polypropylene Bottles

Consumables needed for this application

- Distilled or De-Ionized Water
- Active Ingredient
- NanoOptimizer™ Surfactant System

Instructions:

Note: all measurements are by weight

1. Add 5 parts NanoOptimizer™ and 1 part active ingredient (CBD isolate, CBD distillate, F.S. hemp extract, THC distillate, etc.) to a 1L glass beaker.
   For 1L batch: 250g NanoOptimizer™ / 50g active.

2. Heat the contents of beaker to 65°C and mix thoroughly by hand or with an overhead mixer (do not heat the NanoOptimizer™ above 80°C).
   Initial hand mixing in a hot water bath followed by machine mixing on a hot plate may reduce mixing time.

3. Add 14 parts distilled or de-ionized warm water (~55°C) to the beaker slowly while mixing vigorously.
   For 1L batch: 700g of warm water

4. Continue to mix, scrape beaker walls with a stir stick to remove any stuck material (if necessary).
   When the coarse emulsion has formed completely, the beaker contents should appear mostly homogeneous.

5. Transfer the contents of the 1L beaker into a 1L jacketed beaker.

6. Immerse the ultrasonic probe into the sample, and initiate sonication at 90% amplitude.
   Ensure the probe is properly submerged in the liquid (1.5 - 1 .75" is typically sufficient).

7. Monitor sample temperature during sonication. Ideal processing Temperature is 55 – 60°C, adjust cooling water flow rate as necessary to maintain temperature - do not allow sample to exceed 70°C.
   A steady trickle is typically sufficient if using "cold" city water for cooling.

8. Monitor progress by assessing the color and clarity of the sample - sample will appear to take on more color as particle size decreases. Upon completion, the sample should appear transparent in a glass dropper when held up to a bright light source.
   Typical processing times range from 40 - 50 minutes.
9. We recommend filtering the sample with a .2um or .45um hydrophilic membrane filter to remove any titanium particles or residual microbes.
   Warm emulsion will flow more freely through filter membranes and filter loading can be reduced by filtering slowly.

The instructions above will yield a 5% w/v concentration of active ingredient. If you choose toincrease the active ingredient percentage, particle size will increase accordingly, resulting in reduced emulsion transparency.

#Q700CA System with Air Cooling Option

Note: The lifespan of the titanium probe is approximately 80-100 hours. Replacements can be ordered from Qsonica and the part number is #4205.

Contact Qsonica at 203-426-0101 or info@sonicator.com