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TITLE: GUIDANCE ON EXTRACT DECOLORIZATION

Purpose: The purpose of this document is to give guidance on the procedure to decolor dissolved extract using UNITED SCIENCE CarbonX.

Scope: This procedure applies to personnel processing dissolved cannabis extracts to remove chlorophyll or to lighten the extract.

Responsibilities:

Lab Personnel will perform the filtration operation.

Reagents and Equipment:

- 500 – 1000 g of food grade CarbonX
- Vacuum Filtration Apparatus (1L)
- Buchner funnel or similar
- Optional 5L sidearm Erlenmeyer flask or similar
- Rubber adaptor for vacuum filtration apparatus or Buchner
- Technical filter paper)5-10 micron, for vacuum filtration apparatus or Buchner or similar
- Vacuum source Welch 2042 DryFast diaphragm pump or similar
- Food Grade Ethanol, 200 proof (EtOH)
- Clear glass test tubes, 5 mL
- Filter Bag, 10 micron for CO2 regen
- Spool and filter bag, 10 micron for butane regen.

1.0 Sample Preparation for Decolorization

- 1.1 If the cannabis is a wax or is in solid form, dissolve in food grade ethanol. If the material has a high degree of fats and waxes, combine all dissolved extracted material into 4 Liter bottles and place in -20°C freezer for at least 4 hours, preferably overnight.
- 1.2 Place filter paper into Buchner funnel, wet filter paper with EtOH and turn vacuum source on. Filter the solution leaving the waxes on the filter paper. Rinse the wax residue to obtain the best cannabinoid recovery. Collect filtrate in glass 4L bottle.

2.0 Decolorization Methods

2.1 Dispersive Method

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1. Sample product dissolved in ethanol by placing 2 mL into a clear test tube.
2. Place 1 g CarbonX per 100 mL into glass bottle. Shake bottle and let sit for 5 min.
3. Sample ethanol again by placing 2 mL into a clear test tube. Compare to original sample.
4. If a lighter color is desired, increase the amount of CarbonX to a total of 4 g per 100 mL.
5. Shake for 1 minute on a commercial bottle shaker or roller.
6. Let the solution sit for 5 min.
7. Retest using .
8. Repeat by increasing carbon until desired color is achieved. It is critical that there is sufficient time for adsorption between increased levels of carbon.
9. Filter the CarbonX using a new technical paper and the Bucher funnel apparatus above. Recover CarbonX from filter paper. Regenerate CarbonX according to procedure below.

2.2 Filter Bed Method

1. Sample ethanol by placing 2 mL into a clear test tube.
2. Place technical paper in filter flask.
3. Place 600 mL of CarbonX into a glass filter flask.
4. Place glass filter flask on 4L sidearm Erlenmeyer.
5. Wet technical paper with food grade ethanol.
6. Turn on vacuum.
7. Pour dark ethanol solution through the filter cake.
8. Collect filtrate in 4L flask
9. Sample ethanol again by placing 2 mL into a clear test tube.
10. Compare to original.
11. If a lighter color is desired, repeat the filtration. Regenerate CarbonX according to procedure below.

2.3 In process Filtration Method Using Butane

CarbonX can be added to a sanitary spool to filter the extracts in situ. A filter is needed to keep the carbon from eluting into your process. Five micron filter should be good enough.

2.4 Regeneration

HOT ETHANOL and WATER

CarbonX will eventually foul and become unusable. However, there are several methods that can be used to regenerate CarbonX. First, you can wash CarbonX with hot food grade ethanol to remove waxes and fats and boiling water second to remove chlorophyll. To do this, you should use the filter bed method as described

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above, or on a larger scale, the table top Buchner. You can rotovap the ethanol and discard the residue. Boiling water shall be discarded.

CAUTION: Hot ethanol can be a fire hazard. Do not use near any open flame or any static discharge point. Heat ethanol in a chemical fume hood with adequate ventilation and only use approved hot plates to heat. Ethanol will burn clear and severe burns may result if improperly heated.

CAUTION: Hot water is a burn hazard. Care should be taken when handling.

SUPERCRITICAL CO2

You can regen the carbon with supercritical CO2. You will need a filter bag and a supercritical fluid vessel and CO2 source. Temperature is 80oC at 5000 psi. Waxes and solids will elute from the carbon. Recommended time is 2 hours at 100 mL/min.

Butane

You can regen the carbon with butane. You will need a sanitary spool and filtration bags.

Records:

Revision History:

Revision	Date	Description of changes	Requested By
0	11Aug16	Initial Release, United Science	