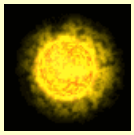
Salvia Divinorum Extractions using Chilled Acetone.



by Sphere February 7, 2006.

Originally found in 2000 and developed to this process in 2001. Copyright 2006.

This extraction and refinement method was worked out and written by an amateur experimenter. I'm not an organic chemist and don't work in a field related to botany or chemistry. The solvents mentioned in this document are very flammable and can be easily ignited by red hot surfaces, open flame, electric or static spark! Avoid risking electric or static sparks from any source and don't try to evaporate solvents in closed areas. Do not use stirring utensils, containers or seals which can react with solvents as any contamination by plastics will completely ruin the extraction which then must be thrown away. This document does not contain enough information to know how to safely handle solvents or their proper use for the manufacture of human consumable products and is not intended to imply that anything produced by this method can safely be used as a food or drug.

I do not advocate or recommend the use of Salvia divinorum or any other psychedelic plant because their use is not right for everyone. Salvia divinorum and its active principal salvinorin A is an extremely potent psychotropic substance which when taken in relatively large amounts can also be strongly inebriating. Due to the intensity and sometimes startling effects produced from the use of this entheogen individuals intending to partake of this plant in any form should thoroughly study the complete range of possible effects before use. If you have made the decision to use Salvia divinorum only do so in private settings with a responsible and sober sitter present, never in public areas or prior to operating machinery of any kind. The dosing of either crude or refined salvinorin as a drug should never be attempted, salvinorin A is far too potent to eye ball a sub-milligram dose which can only be accurately done if using an analytical balance with accuracy within a tenth of a milligram or better costing many hundreds of dollars or more. Individuals seeking info on the possible negative effects and common problems produced from attempting to directly smoke or dose with either crude extract or refined salvinorin should start by reading the warning document at the following URL: http://www.tinyurl.com/6urcj - Use this process or smoke Salvia divinorum or salvinorin enhanced materials at your own risk!

IMPORTANT

When using this process, whether extracting 100 or 3000 grams of dried leaf will require close to the same amount work easily taking an entire weekend or longer waiting hours between each of the steps to produce either small or large amounts of refined salvinorin. The amount of time it takes to extract and refine the extract could be greatly reduced through the use of a centrifuge to speed up the settling of either the fine sediments from the leaf or salvinorin but has not been incorporated into this tech because most people do not have access to that kind of equipment.

When ordering small amounts of leaf from a retailer to make a quantity of enhanced leaf, unless a labor of love or a hobby this process is both time consuming and expensive. Because of this you would probably be better off buying enhanced leaf from a retailer than trying to make your own. However, if you are interested in producing large amounts of enhanced leaf when purchased at wholesale prices direct from Mexico in bulk quantities Salvia divinorum can be had fairly cheaply for as little as 11 cents a gram in 10K gram quantity and 7 cents a gram at 50K gram quantities which when processed in large amounts is far more economical in both time and cost to produce.

For this extraction and refinement method to be successful patience is required when working through each step of the process. Most individuals who first attempt this extraction and refinement method end up with fine sediments in their extract because they have not thoroughly removed enough from both settling of the extraction solvent and or incomplete washes of the crude extract with water. Because of this I have worked a purity confirmation step into the process which will remove the last of the sediments to net high purity salvinorin.

How it works

In this extraction and refinement process a single batch of Salvia divinorum leaf is progressively extracted three times over for three minutes using zero degree F. chilled reagent or technical grade acetone. The use of chilled acetone dramatically reduces the amount of waxy chlorophyll lipid fats extracted from the leaf while at the same time remaining highly soluble to salvinorin to temperatures as low as negative 20 degrees F. After the leaf has been poured off or filtered from the acetone a large amount of ultra fine particles of plant material will remain suspended in the fluid which can be removed by waiting 24 or more hours for them to completely settle to the bottom of the container, once settled pouring the fluid off of the sediments in the bottom for evaporation in another container. This is best done using a large clean flat glass cooking container which will increase the speed of evaporation due to the increased surface area of the solvent to the air but should be done in the dark to minimize the reaction of ultra violet light to the salvinorin which can weaken the potency. After complete evaporation of the extraction solvent an amount of water may remain in the evaporation container, especially if the rate of evaporation has been increased by the aid of a fan which often causes a large amount of condensation to collect in the container. Once all hint of solvent can no longer be detected by smell the water can be poured off into a separate glass and either set aside for 24 hours to allow whatever salvinorin particles may be contained in it to settle to the bottom for by evaporating in a 150 degree electric oven to check for salvinorin which may be found in low to high quantities, depending upon many variables..

Once the extract solids are completely dry of all moisture clean naphtha (AKA white gas or shellite) is poured directly into the evaporation container and all of the extract solids and films deposited on the sides of the evaporation container are scraped together and worked into the fluid until nothing but extremely fine grains of extract solids remain in the fluid, the finer the better. Salvinorin is insoluble to naphtha but the waxy lipids and chlorophyll contaminates are moderately soluble to this solvent allowing them to be progressively washed out of the extract solids. After washing the extract with naphtha the fine particles of salvinorin which will be stirred up into the fluid will take a period of time to completely settle to the bottom of the container after each wash.

Care must be taken to wait long enough for all of the fine crude particles of extract to completely settle to the bottom of the container before this refined light petroleum solvent is poured off of them, being careful none of the solids are poured out with the naphtha when removing the fluid. The naphtha washes to the remaining extract solids are repeated over and over again until the solvent no longer continues to take on additional color ending the multiple washes when the naphtha is a light green translucent fluid. The extract is then completely dried until no hint of naphtha remains. To remove the tannin contaminates the extract is washed with an ounce or two of room temperature water and then waiting however long it takes for the particles of crude salvinorin to settle to the bottom of the glass before pouring the water off of them. The water washes of the extract are repeated until the water no longer takes on color, when done completely drying the extract of all water moisture and powdering.

Further purification can be accomplished through multiple washes of the extract with small amounts of 99% isopropanol in a ratio of no more than 1/2 dried extract to 1/2 isopropanol by volume, more fluid can be used per wash but the glass should be no more than half full of extract. Although naphtha will remove a large portion of the dark compounds from the extract this solvent is not capable of removing all of the chlorophyll and lipids from the extract without performing many time intensive washes of the extract. Isopropanol will remove the last of these impurities much quicker with far less amount of work but at a cost to total yield because salvinorin is weakly soluble to isopropanol causing a portion of the salvinorin to be removed from the extract at close to 1 mg per ml of fluid, if having waited for the fine particles to settle each time. To minimize loss of salvinorin yield it is important to wait for all cloudiness of the isopropanol to settle to the bottom of the glass before removing the fluid off of the extract solids in the bottom of the glass. Once the extract is a light green color it is quite pure enough and can then be dried and if desired purified to a white colorless substance with continued washes. After the extract has reached the desired purity all hint of isopropanol should be evaporated from the extract which is then crushed to a fine powder.

To confirm that all of the fine leaf sediments have been removed through settling and or the water washes of the extract an additional step should be taken by dissolving all of the refined salvinorin into an amount of acetone and checking to see if the fluid appears cloudy. The fluid can be light yellow to dark green depending upon how much of the impurities have been removed from the salvinorin but should never be cloudy. If the fluid remains clouded either the salvinorin has not been completely dissolved or an amount of fine sediment remains the extract. As a general rule, for 100 to 250 gram extractions of Salvia leaf use at least 100 ml of acetone for this test.

Chilled acetone extractions use exactly the same steps as for longer term room temperature Salvia divinorum extractions using 99 percent isopropanol (IPA) or high proof ethanol except when using chilled acetone the amount of time the leaf is in the acetone should be limited to about three minutes for each of the three extractions for a total of no more than 9 to 10 minutes in the chilled solvent. All of the solvent from each of the three extractions to the same leaf are then combined together in one container to sit completely still for at least a 24 hour period of time to allow most of the ultra fine sediments to settle to the bottom of the container

Although the majority of the salvinorin will be removed during the first three minute extraction I recommend extracting the leaf three times over just to be sure. If the amount of time the leaf is kept in the chilled solvent is limited to ten minutes total the amount of waxy lipids extracted will be far less than if having extracted the leaf for a longer period of time. Longer extractions with acetone are not necessary, even when chilled using this process efficiently extracts virtually all of the salvinorin from the leaf in just three short extractions which upon removal of the fine sediments and evaporation will produce an extract which is very easy to refine using nothing more than a few washes with naphtha and 99 percent isopropanol.

When working in a room temperature environment pre-chilling both the leaf and the extraction container with the acetone together to a temperature no higher than 20 degrees F. will help keep the temperature below 40 degrees F. throughout the extraction. You want to start out cold and keep the solvent cold throughout the extraction, but when working in a warm room the temperature of the fluid can increase by 20 degrees F. to be as high 40 degrees F. while finishing up the last of the three extractions. This amount of temperature increase is ok, but no warmer than that and only during the last couple of minutes the leaf is in the solvent or you will begin to pull over additional waxy lipids in a hurry.

Due to the high solubility of salvinorin to acetone, even when chilled to zero degrees F. acetone is still far more effective for dissolving salvinorin from the leaf than room temperature 99 percent isopropanol or high proof ethanol alcohol, so don't worry about chilling the acetone that far down because your extraction efficiency will still remain very high when using zero degree F. acetone. If you are considering the idea of using chilled isopropanol or ethanol to extract leaf it won't work, I tried 99% IPA and found that it required four times the amount of time in solvent for one quarter the extraction efficiency of chilled acetone!

Extremely brief extractions of Salvia divinorum leaf of one minute or less with acetone chilled to close to zero degrees F., with exception of an amount of fine particles of plant matter will yield a small amount of nearly wax free high purity salvinorin. When extracting Salvia leaf for just one minute you might not get the majority of the salvinorin out of the leaf, depending on how well you agitate the leaf in the solvent, but you should get close to half of it. At one time I had reported that chilled acetone extractions were less efficient than room temperature acetone because when using 99% IPA to remove the dark waxy lipids from the extract I did not wait long enough for the salvinorin particles to all settle out of the fluid which was what really caused the losses and not due to the solubility of acetone being too low from being chilled to zero degrees F.

The photo collage shows an acetone extraction that started at +5 degrees F. which warmed to +15 degrees F. by the time the extraction was completed. This amount of temperature increase when working in a warm room is typical, even if you have pre-chilled both your leaf and extraction containers together with the acetone at the same time. Shown in the photograph are naphtha washes of the extract, two washes with water and then four washes with 99% IPA to further remove impurities yielding nearly white salvinorin. 99% isopropanol can be used to further clean the waxy impurities from the extract more effectively but will also remove a portion of the salvinorin with each wash of the extract solids. The water washes of the extract are not absolutely required but if doing so be sure to wait for all cloudiness to dissipate from the fluid to assure that the fine salvinorin particles have settled to the bottom of the container before pouring the water off.

When removing lipid fats or waxes with 99% IPA the cleaner the salvinorin gets the longer it takes to settle to the bottom, sometimes taking hours to all settle to the bottom of the glass. If you have removed most of the dark green from your salvinorin and are left with a cloudy yellow fluid this means that you still have lots of super fine salvinorin particles floating in the IPA (as seen in the photograph below, the IPA was still cloudy) and for maximum yield or minimum losses must wait until the fluid is completely clear before pouring off the IPA. The fluid can be colored, but not so cloudy that you can't see through it as solvents which are fully saturated with salvinorin are never that cloudy and should be clear unless salvinorin particles are still floating in it (unless fine sediments are still present). Even if you have waited long enough for all cloudiness to settle out of IPA used to remove impurities from your extract be sure to save this solvent because something in the dark compounds from the leaf appears to increase the solubility of salvinorin to isopropanol to be able to hold well over 1 mg per ml of salvinorin per ml of fluid, reported to some times be as high as 5 mg per ml by a chemist who had the use of an HPLC to test the solubility of salvinorin in a few different solvents. Whether the ability of IPA to hold that much salvinorin per milliliter was due to an actual increase of a solubility to IPA or whether it was caused by fine particles of salvinorin that were still floating in the solvent is something to consider.

The following image shows a chilled acetone extraction at +15 degrees F. which yielded a total of 525 milligrams of cleaned salvinorin from 250 grams of crushed leaf.

250g hand crushed leaf

+5 to +15 F. extraction

After 3 min. pour off leaf

Comb. Acetone & wait 12 hrs.

Pour off sediments

Evaporating Acetone

Dried extract

Scraped from bowl

Chilled extract weighed

Two Naphtha washes

Dried and weighed

First water wash

Second water wash

Removed water

Dried and weighed

First IPA wash

Second IPA wash

Fourth IPA wash

325 mg white Salv.

Cleaned Salvinorin

The above photo's showing 325 mg of cleaned salvinorin did not include the salvinorin later recovered from the IPA used to remove the dark chlorophyll and waxy lipids.

The weight of salvinorin shown in the photograph of the scale is not representative of the refinement efficiency because when I did this extraction I did not wait long enough for the super fine salvinorin particles to fall to the bottom of the glass and unknowingly removed lots of salvinorin when using the IPA to remove the dark waxy impurities. I have left the pictures in showing what isopropanol clouded with fine salvinorin particles looks like but be sure not to pour the IPA off of the solids in the bottom of the glass until after the fluid becomes translucent which indicates that the fine salvinorin particles have settled to the bottom. The required translucency can be seen by viewing the photographs of the orange capped 100 ml jars near the end of this document which show the purity confirmation step to assure the fine sediments from the leaf have been removed from the extract.

I later recovered the salvinorin from the last two washes by completely evaporating the IPA and cleaning it once more using naphtha and more IPA which netted another 200 mg of salvinorin making a total of 525 mg of cleaned salvinorin from the 250 gram extraction of dried leaf which is above the normal extraction and refinement yield from this amount average potency leaf. If the leaf extracted was average or higher than normal potency is something I have no way of knowing except perhaps to see higher than normal yields if everything else has been done right to minimize processing losses. I have both read reports confirming and denying that the potency of Salvia divinorum leaf varies from 2.5 to close to 4 mg salvinorin per mg of dried leaf and don't know what to believe at this point but I have extracted both high and low priced Salvia leaf to find no difference in the amount of salvinorin extracted.

Extraction outline without the water washes to the extract.

Although I find that the water washes to the extract to be helpful if desiring to further purify the extract using 99% isopropanol, they are not necessary if substituting the water washes with the purity confirmation step at the end of the process.

1. Fully dry leaf in an electric oven set to 125 degrees Fahrenheit. Dried leaf strait out of the bag from a vendor typically contains 15 percent moisture by weight.

2. Hand crush the leaf to a fine consistency to minimize the amount of acetone needed to completely cover the leaf.

3. Soak leaf in zero to +20 degree F. chilled acetone for 3 minutes, stir, pour off and save.

4. Repeat the 3 minute extraction to the same leaf three times over saving the acetone from each extraction in one container. Be careful to keep the cold acetone off your skin as it could cause freeze burns.

5. Discard leaf. If you have concerns that you may not have extracted all of the salvinorin pour more acetone in and let sit for however long you desire. Due to the increased amount of impurities which will be drawn into the solvent when soaked for longer periods of time process and evaporate separately.

6. Once every bit of leaf has been removed from the acetone cover the container to prevent evaporation and place in a relatively cool but completely dark location and wait 24 hours for the ultra fine brown sediments removed from the leaf to completely settle to the bottom of the container.

7. When done waiting for the sediments to settle pour the acetone off of the brown material in the bottom into a separate container being careful not to stir up the fine particles, save the acetone for evaporation and discard brown colored residue on bottom. If you are concerned there might be an amount of salvinorin remaining in the sediments add fresh room temperature acetone, stir and let settle for another 24 hours.

8. After separating the extraction solvent from the sediments completely evaporate the acetone. Do this in a relatively dark place completely shielded from direct sunlight. Complete darkness is preferred to minimize reaction with UV light which can destroy a portion of your yield. After evaporation of the acetone save any amount of water found because this may contain a substantial amount of salvinorin in it. Evaporate this water separately in a small custard bowl (once all hint of solvent are gone) in an electric oven set to 150 degrees F. and look for a light green to white powdery residual which will be salvinorin.

9. Upon complete evaporation of the acetone and all water moisture from the extract solids naphtha can then be used to remove the waxy non-active lipids and chlorophyll contaminates from the extract solids. I have found that the easiest way to do this is to pour a few ounces of naphtha directly into the evaporation container and working the solids into the fluid until all of the lumps are completely dissolved, crushing and smearing by hand if necessary. If you are having trouble dissolving the last of the waxy remains I have found that by briskly beating the extract into a bowl of naphtha with a stainless steel wire kitchen whisk that the small pieces will completely dissolve without much trouble. It is very important to make sure that all of the lumps of extract are dissolved into as fine a consistency as possible. Once you are done dissolving the extract let the naphtha sit completely still for an hour to allow enough time for the fine particles of salvinorin to settle to the bottom of the bowl, especially if having used a large amount of naphtha which may take longer.

10. After waiting long enough for all of the crude salvinorin extract to settle to the bottom of the container slowly pour the naphtha off being careful to leave all of the precious particles of extract in the bottom behind for further purification by additional washes with clean naphtha. Save the green naphtha you have poured off of the crude salvinorin solids because extremely small grains of salvinorin that only appear as a light cloud in the fluid will continue to fall out of the naphtha for a few more hours.

If you are in a hurry to process the extract, after all of the larger particles of crude salvinorin have fallen to the bottom of the glass you can go ahead and pour the naphtha off of the solids before the fluid has completely cleared of all cloudiness. Be sure to set the naphtha you have poured off aside for a few hours and recover the last of the salvinorin that falls out later. Do not confuse the tiny particles of crude salvinorin which initially fall to the bottom of the glass within an hour or so with what I am calling cloudiness of the fluid which is caused by much smaller particles which cannot be individually seen except as a haze in the naphtha. The haze may cloud up a large volume of the fluid but is a relatively small amount of salvinorin.

11. Add more naphtha to the extract solids, stir or shake and then let set long enough to completely settle again. When the glass of naphtha is viewed with a flashlight the level of the fine particles of salvinorin can be seen even when the fluid is darkly colored, sometimes taking an hour or longer to completely settle when using a 25 to 50 ml glass, longer for larger volumes of fluid.

12. Continue washing the extract solids with naphtha until the fluid no longer changes color with each subsequent wash of the extract, allowing enough time for the fine salvinorin particles to settle to the bottom each time.

13. When satisfied you have removed enough of the chlorophyll pour off every drop of naphtha and dry the extract. The extract is now pure enough for most any kind of enhanced leaf but don't try to smoke. This extract is far too pure for direct use as a drug. I do not recommend or mean to imply that anything made from this process can be used as a drug or is suitable for human consumption! Use at your own risk!

14. Purity confirmation: If you want to be sure there is no sediment impurities in the extract pour all of the extract from up to a 1 kilogram extraction of dried leaf into no less than 150 ml of room temperature acetone (warm if having trouble dissolving the extract). Stir the extract into the acetone until completely dissolved and wait 24 hours for the fine particles, if present, to completely fall out of the acetone. Seal the container and store in a completely dark place the entire time while waiting. After 24 hours slowly pour the acetone off of the sediments in the bottom of the container and evaporate. Most individuals will find that sediments are still in the extract regardless of having done everything else right because even after 24 hours of waiting for the them to settle an amount will still be in the fluid.

If the last of the fine sediments from the leaf have been removed from the extract by either washing the solvent free solids with water or having performed the purity confirmation step at the end of the process (preferably both) the extract can be further refined all the way to white by washing the crude salvinorin solids with small amounts of 99 percent isopropanol the same as shown for the naphtha washes, waiting for all cloudiness of the fluid to settle before pouring the fluid off of the solids in the bottom of the glass.

Use no more than 15 to 30 ml of 99% IPA for each wash of extract from a 100-250 gram extraction of dried leaf because each wash of the extract with IPA will remove close to one milligram per ml of fluid each time the solids are washed through, if having waited for all of the super fine cloudy particles to settle each time. However, to save a considerable amount of time you can pour the IPA off once the larger particles of salvinorin have settled to the bottom of the glass and recover the finer salvinorin particles later, as explained in the next paragraph. 70% IPA cannot be used to clean the extract, only use 99%. One benefit to using 99% IPA to continue refining the extract is that the IPA will also wash out many of the impurities which might have been introduced through the use of somewhat impure extraction solvent and naphtha.

Save all of the isopropanol used to clean the extract because fine particles of salvinorin will continue to fall out of the fluid, especially if the fluid was poured off too soon or while still cloudy which may be difficult to know if darkly colored. After several hours the fluid can then be poured off of the solids which will have settled to the bottom of the container to recoup more of the salvinorin but the darkly colored solvent should not be thrown out, evaporate and reprocess with naphtha washes to get most of the salvinorin lost to the isopropanol washes back. Losses will continue to add because each time salvinorin is dissolved into a solvent and then evaporated back out into a solid a portion of the yield will be lost.

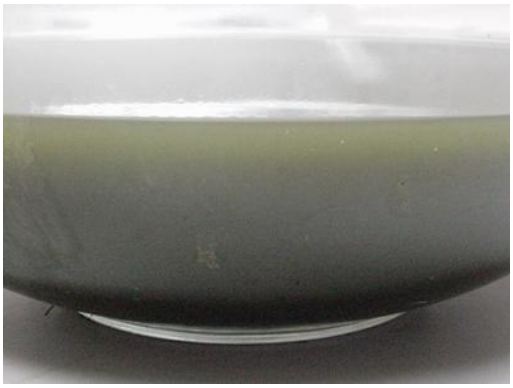
One method of purification which works fairly well to recycle salvinorin lost to the isopropanol washes is to take all of the IPA used to wash the extract and place in a long thin glass vial or tube for slow evaporation, as the solvent evaporates the dark impurities in the fluid will coat the upper portion of the glass tube leaving the purer salvinorin solids to coat the lower portions of the tube at a fairly high purity which can later be separated by scraping the purer coating of salvinorin off of the glass, re-processing the lower purity films by cleaning with naphtha and IPA if desired or the same way over in a smaller diameter tube. This effect is most pronounced if using a long tube 1/10 or less as wide as tall and filled to near the top with solvent to allow as much separation between the top and bottom of the glass as possible leaving a purer coating at the lower portion of the tube. If you have too large volume of isopropanol for the size of tube evaporate the IPA and completely re-dissolve into acetone which will hold far larger an amount of salvinorin per ml but the amount of fluid should fully fill the evaporation tube, add more acetone if necessary.

(Continued below)

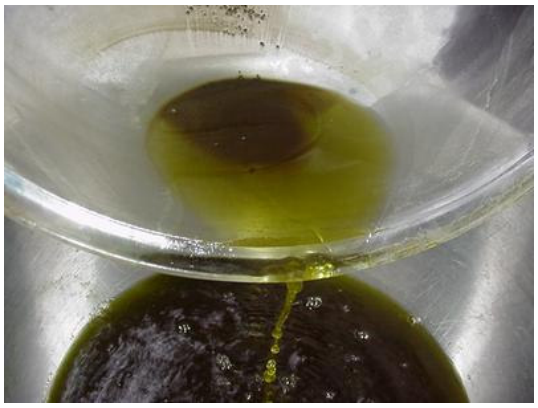
In this sequence of photographs I show the water washes to the extract solids to occur directly following the complete evaporation of the extraction solvent

Dried Salvia divinorum leaf, when bought in bulk it isn't very pretty but is plenty potent. I bought mine from www.aztecasplants.com direct from Mexico. Carlos' 10 kilo minimum is expensive for most individuals but for 11 cents a dried gram (2005) is a very good deal if you can split the order with others. To reduce the amount of solvent needed to extract the leaf hand crush to a fine consistency, no need to powder it.

Extract the leaf with chilled acetone. Add enough solvent so that the leaf is entirely covered by fluid while stirring. Extract the same leaf three times over and save the solvent together from each extraction. A screened kitchen sieve with a large paper coffee filter inserted into it will help here. Because the paper filter always fills up with lots of fine brown colored sediments you will probably have to change it out several times as you go. Try as you may, even with your best efforts you won't be able to get all of it out with paper filters.



Pour the solvent from all three extractions together into one bowl, cover and set in a dark place while waiting for the ultra-fine particles to settle to the bottom. After a few hours the fine brown sediments will appear to settle from the top down, let the fluid set still for at least 12-24 hours before pouring the fluid off of the brown material in the bottom and into another container.



After the fine brown particles have been given enough time to settle to the bottom of the container, usually 24 hours, slowly pour the solvent off of the sediments in the bottom of the container and into another container for evaporation.

After the ultra fine sediments have been removed through separation, completely evaporate the solvent in a clean bowl or even better a wide flat glass cooking dish to maximize the area the fluid is exposed to air which will speed things up considerably, especially if aided by airflow from a fan. Upon evaporation the thin yellow to green films which usually deposit on the sides of the evaporation container are fairly high purity salvinorin so be sure not to leave them behind. (Solvent from a chilled acetone extraction which is already more than half evaporated).

The wet extract from a chilled acetone extraction shown in this photo has far less dark waxy chlorophyll and lipid compounds compared to an alcohol extraction. If having rapidly evaporated the fluid through the use of a fan cooling often causes an amount of water from condensation to collect in the bowl, as seen here.

This water may contain a substantial amount of salvinorin from the leaf along with an amount of tannin appearing a creamy yellow to green color which when evaporated in an oven set to 150 degrees F. sometimes produces a hard brown solid that does not contain much salvinorin and other times, especially if having extracted the leaf using chilled acetone can contain a large portion of your total yield of salvinorin. Once all hint of solvent is out of your evaporation container pour the water off of the extract and save for later evaporation, take care the small particles of crude extract don't go out with the fluid too.

The above photograph shows the bowl after evaporation of the water, once dried was found to contain mostly tannin. The tannin can then be powdered and re-extracted with 99% isopropanol or acetone to get the last of the salvinorin which may have been carried away by the water. The right photo is tannin from bowl scraped into a 100 mg pile of brown sand-like particles which can later be finely crushed to a powder and re-extracted.

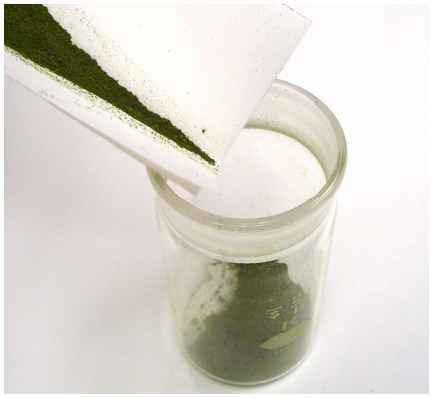
Note: The above two photographs from another extraction show a large amount of high purity slightly green salvinorin (appears white due to bright lighting) recovered from water which had been poured off of the extract solids in an evaporation container after all hint of acetone no longer remained in the fluid. The water had formed in the evaporation container from condensation due rapid cooling caused by fan evaporation of the acetone and when poured off of the extract solids had a green milky appearance. I added approximately two more ounces of room temperature water into the evaporation container before pouring the water off and sloshed it over the extract solids for a minute and then poured all of the water into a small glass bowl for evaporation overnight at 150 degrees Fahrenheit. The next morning I was surprised to find over half of the total yield of salvinorin for the whole extraction had been in the water. If I had taken the water and let it stand completely still for 24 hours to allow enough time for most of the salvinorin particles to settle to the bottom of the container this would have made separation much easier by just pouring the water off of the solids in the bottom rather than evaporating the entire amount of water which will increase the amount of tannin in the extract due to its high solubility to H2O.

I was surprised to find this amount of high purity salvinorin in the water because salvinorin is insoluble to water and will not normally contain much salvinorin, usually only containing tannin. The reason the water contained so much salvinorin was because I had both added more water to the extract and briskly sloshed the water over the extract solids in the evaporation container before pouring it off which obviously caused a large portion of the purer particles of salvinorin to be carried away with the water. This does not normally occur when doing room temperature solvent extractions, whether using acetone or alcohol because most of the salvinorin is bound up in the large amount of waxy impurities extracted with room temperature solvents and because of this unable to be so easily separated from the extract through washing with water.

This could be considered an extraction process in itself when doing chilled acetone extractions as a short cut method of obtaining close to half of the total yield in fairly high purity salvinorin which is nearly pure enough to make standardized leaf from, but works best if adding additional water to the extract solids to wash them through with after the solvent is completely evaporated.

The above photo shows the extract solids after complete solvent evaporation and removal of water from condensation. After evaporation the extract solids can be wet due to condensation created from rapid evaporation of the extraction solvent with a fan. If wet, crush the solids as finely as you can before washing the extract with water. If your extract is not moist from water the next step can be completed after the naphtha washes, as long as all hint of naphtha has been evaporated out of the extract first.

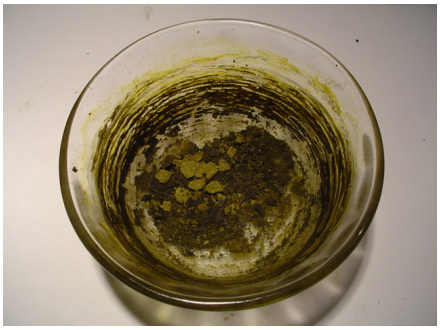
First water washing of the crude extract. The water will take on a brown to yellow coloring which will be reduced with each wash. The water can be yellow to dark brown but should not be hazy or clouded as seen in the photograph on the left or fine particles of salvinorin may still be stirred up into the water. Wait for the water to clear of all cloudiness as seen in the right photograph before pouring the water off of the crude salvinorin extract in the bottom.



After the water washes to the extract fully dry of all moisture and crush the solids into a fine powder & load the extract into a 30-50 ml via for washes with naphtha. A larger glass can be used but should be fairly narrow compared to its height.

First and last naphtha wash of the crude extract. The first wash may be difficult to see through to know if the particles of crude salvinorin extract have settled to the bottom of the container but shining a small bright flashlight close to the side of the glass will allow a view of the particles, even if darkly colored. Save all of the naphtha you pour off from each wash in one container as more particles will continue settle over a 24 hour period netting an additional ten percent or more of salvinorin extracted.

The last wash of naphtha should be a lightly colored fluid but should not have so much cloudiness that you cannot see through the naphtha otherwise fine particles of salvinorin will be poured out when removing the fluid from the extract in the bottom. After all of the naphtha washes to the extract solids have been completed the extract may be from 50 to 75 pure, depending on how careful you have been with each step. In my opinion the extract does not need further cleaning with isopropanol, however further refinement can be accomplished by washing the extract solids with small amounts of 99% isopropanol the same as had been done using naphtha waiting for the particles to settle each time, but be sure to use as little fluid as possible due to the solubility of salvinorin to this solvent which causes some of the salvinorin to be carried away by each ml of isopropanol regardless of waiting for all of the salvinorin to settle during each wash of the extract.



If after initial evaporation of the extraction solvent the water washes were not completed you can now perform them to remove more of the possible tannin contaminates. The extract solids must be completely evaporated of all hint of naphtha and crushed into a fine a powder before adding water. The above photos show what naphtha washed extract looks like after drying but needs to be crushed for further processing.

If you are going to further remove the dark green contaminates using 99 percent isopropanol the extract must first free of fine sediments. You can remove the last of this impurity using the purity confirmation method by dissolving all of the extract into acetone and waiting for the fine particles to fall out of the fluid and separating one last time before evaporation. Whether the water washes to the extract have been done or not the purity confirmation step is a must if you are going to try to refine the extract further using isopropanol. If you do not assure that all of the sediment is out of the extract at some point continued washes of the extract will cause the solids to eventually start become a sandy brown color instead of white, as more and more of the light salvinorin is washed away by the IPA in a futile attempt to lighten the salvinorin to a white color by excessive washes of the extract which if carried out to an extreme will end with nothing but light brown sandy sediments remaining in the glass.

99% Isopropanol washes to extract solids

The above lineup of photographs shows six washes to crude salvinorin extract using 99% isopropanol. One or two washes to the extract with 99% IPA is enough to lighten the extract into a purity which is high enough for just about anything without suffering additional losses to the final yield, because of this further refinement is not recommended. However, the extract can be lightened to a white purity if you don't mind loosing up to half of your total yield from up to seven washes to the extract at a ratio of ½ extract to ½ IPA. Of course, as explained above the salvinorin which is washed away can later be recovered but I don't see the need to make the extract near completely pure unless wanting to grow crystalline specimens or make standardized materials.

As can be seen in the left most photo the first wash of the extract causes the IPA to immediately take on a very dark color, far darker than the naphtha had become after the last wash with that solvent. Isopropanol is far more effective at removing the last of the dark waxy impurities from the extract than naphtha is able to do but also removes a portion of the salvinorin with each wash. The level of extract seen in the above photographs does not represent the amount of extract remaining after each wash of the solids because the photographs were taken at different periods of time and cannot be used as an indication of the approximate amount of extract remaining in each glass, as can be seen in the last photograph which is completely white without any coloration from impurities, the salvinorin is still settling to the bottom of the glass, taking many hours to completely settle to the bottom when this pure.

The isopropanol in the first three washes of the extract may be too dark to see if there is much cloudiness in the fluid but can always be seen if shining a bright flashlight through the side of the glass. The last three cleanings on the right side of the sequence of photos shows the isopropanol with a haze or cloudiness to it. For maximum yield, prior to removing the fluids off the top of the solids whether pouring or using an eye dropper to suck the fluid out it is best to wait for the fluid to completely clear of all cloudiness as the finer particles of salvinorin settle to the bottom with the courser particles. However, this can take a full day of waiting, especially when the extract has become fairly pure. If you don't want to wait the amount of time it takes for them to all settle the fluid can be removed while still cloudy and poured into a separate glass container to wait for the remaining ultra-fine particles to settle, or completely evaporated and re-worked with more naphtha and or Isopropanol washes to recover the last of the salvinorin.

Purity confirmation

After completing either the naphtha and or isopropanol washes to the extract solids it is a good idea to confirm that all of the sediments are is out of the extract. This can be done be dissolving all of the extract into enough acetone to completely hold all of the salvinorin in the fully dissolved state. I call this the purity confirmation step but this last step won't tell you how pure the extract is, however it will confirm that every bit of the sediments which can easily be separated from the extract has been removed and if present will allow a final removal at this point. The above two photographs show what one and a half grams of slightly green but close to white isopropanol cleaned salvinorin from a fairly large extraction dissolved into approximately 100 ml of room temperature acetone looks like before and after settling of the fine impurities. The photograph on the left was taken minutes after completely dissolving the salvinorin into the acetone and is clouded from fine brown particulates from the leaf which were stirred up into the fluid.

The photo on the right is the same fluid after 24 hours of settling, still colored but clearly translucent. Slight amounts of chlorophyll in the extract colored the fluid a light yellow but after evaporation the salvinorin appeared nearly white. If your extract solids were cleaned using naphtha alone without additional purification using 99% isopropanol the fluid will appear a dark green color and due to the amount of coloring may be difficult to see through without holding up to a bright light.

The above two photographs show the salvinorin deposits evaporated out of the acetone from the above 100 ml jar used to remove the last of the sediments. The four inch diameter bowl used for evaporation is rather small and because of this caused the salvinorin to cake on the sides and bottom of the glass in a very thick layer.

As can be seen in the photo on the left nearly all of the dark impurities which colored the acetone yellow have deposited in a ring completely circling the top of the bowl. As salvinorin containing solvents evaporate the dark colored impurities always form a ring above the purer and heavier salvinorin below which can be used as a method to further purify the extract. The photo on the right shows a magnified view of the bottom of the bowl where due to the small size of the evaporation container the salvinorin has massed together into a nearly indistinct layer of crystalline material, as on the sides of the bowl too.

Warnings about smoking crystalline salvinorin whether pure, crude or infused into paper can be found at www.sagewisdom.org/caution.html Smoke high purity salvinorin or enhanced materials or leaf at your own risk!!