

## **Methods to Crystalline Salvinorin. February 8, 2006.**

**by Sphere. Copyright 2005, 2006.**



Above photograph: Salvinorin crystals submerged in naphtha.

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 their research by reading the warning document at the following URL: <http://www.tinyurl.com/6urcj>

## **How to grow or obtain salvinorin crystals**

Growing crystals isn't always easy or guaranteed to be produced each time but here are three ways to obtain them. The first two methods were taught to me, the third method I developed myself:

Methods to salvinorin crystallization:

### **1. Crystal formation through the cooling of salvinorin saturated hot solvents:**

Dissolve as much high purity salvinorin powder as you can into 99% isopropanol (IPA) or 191 proof Everclear® ethanol alcohol (~5% water) warmed to 120-140 degrees F. and then wait for the fluid to cool to see if crystals later form. Sometimes I have to reheat a vial of salvinorin and ethanol several times to at or just below boiling before they might grow when cooling. If crystals are going to appear they should be there within an hour or two. Each time I reheat the fluid a portion of the salvinorin is lost causing more and more loss with each attempt, usually requiring three to four cycles of heating and cooling before the crystals appear. 99 percent IPA can be used instead of high proof ethanol but the crystals are usually smaller compared to ethanol. Methanol can also be used but I do not like to work with such a toxic solvent due to fumes or contact with skin.

### **2. Crystalline deposits from solvent evaporation:**

Dissolving high purity salvinorin into acetone and allowing the solvent to slowly evaporate at room temperature some times will produce interesting crystal formations over a period of a few hours, depending upon how much solvent you are evaporating, but not always. I have grown crystals by evaporating small amounts of acetone in either an electric oven at 125 degrees Fahrenheit (fire danger! No more than a ounce of solvent in a spice bowl) or by slow room temperature evaporation without the aid of extra airflow which can take several days. Slow evaporation usually produces larger crystals than when heat evaporated. The salvinorin must be better than 90% free of waxy impurities if trying to grow crystals. If you have too much of the waxy impurities from the leaf in the extract these darkly colored lipids will hide the crystal formations from view or stick to the surfaces of the crystalline structures. Extract which has been cleaned of nearly all impurities work best but even impure extracts can sometimes produce crystals due to the way the wax will deposits high up on the sides of the evaporation bowl depositing almost all of these waxy compounds in a ring around the top of the glass leaving clean crystalline structures to form near the bottom, as the last few ml of fluid evaporates away. If too much salvinorin is dissolved into acetone compared to the size of the evaporation bowl the crystals often form in a large mass which may not be clearly identifiable as crystals and instead a flat cake of crystalline material. From 100 to 200 mg of salvinorin dissolved into acetone and evaporated in a four inch diameter spice bowl works best for obtaining individual crystals instead of a flat mass.

### 3. Isolation of crystals from dried extract using naphtha:

Through trial and error extraction research I was surprised to find that the dark waxy extract from a 99% isopropanol extraction of *Salvia divinorum* is loaded with small crystals which are formed within the solids as the solvent from the initial extraction evaporates. The following explains how to isolate these tiny crystals out of extract but works best only if you have removed as much of the fine sediment contaminants from the leaf as you can from the extraction solvent first. The way I do this is by letting the extraction solvent sit undisturbed for 24 hours to allow enough time for these fine particles to settle out of the fluid. Once the sediments have settled pour the extraction fluid into another container for evaporation, leaving the sediments behind.

Evaporate all hint of the extraction solvent so that only waxy solids remain and then pour pure naphtha (AKA white gas or shellite) into the evaporation bowl and completely dissolve all of the solids into a few ounces of naphtha, scraping every bit of the films which have deposited on the sides of the evaporation container. It is very important that all clumps of waxy material are completely dissolved into the fluid until no bit of grain or lumps remain. This can take a bit of effort but goes along quickly if smearing the wax in the naphtha between your fingers if you don't mind exposure to naphtha. If you don't want to get naphtha on your skin use an egg beater whisk in a bowl of solvent and briskly beat the naphtha and extract into the fluid until completely dissolved. Once finished working all of the clumps out of the extract solids stir the extract for just a minute or two and then leave the container of naphtha alone to sit still for at least a half hour or more to allow enough time for the fine salvinorin particulates stirred up into the naphtha to settle to the bottom of the container. After the particles have settled the fluid should be translucent without any amount of cloudiness to it you can then pour the naphtha off of the extract solids in the bottom of the container, being careful none of the extract solids pour out with the naphtha and then add more clean naphtha back to the container washing the extract through again, waiting a half hour or more each time. Keep washing the extract with naphtha until it will no longer take on much more color and has become a light tinted translucent green.

After completing the naphtha washes to the extract solids, pour off all of the naphtha and completely dry the extract of any hint of naphtha. Save the naphtha poured off of the extract in a glass for 12 hours or more to see if more particles settle. I commonly find ten percent more the next day. Next, after the extract solids are completely dry without hint of any naphtha pour in an ounce or two of water into your container of extract and stir for a couple of minutes, allow time for the particles to settle to the bottom of the glass and pour the water off, adding more water to the extract and stirring again. If tannin is present in the extract the water will become a yellow to brown tint. I like to work with only an ounce of water at a time to be able to know when all of the tannin has been completely removed and I can stop washing with water.

Once you are done removing the last of the tannin from the extract solids through the water washes, completely dry the extract of all moisture and place all of the dried extract into a small spice bowl. Pour in enough fresh naphtha into the bowl so there is about a half inch of naphtha on top of the extract and briskly stir for a few seconds with a spoon, then place the glass or bowl into a hot box which is regulated to remain at about 125 degrees F. I have done this with an electric oven for small amounts of fluid by keeping the small bowl of naphtha as far away from the heating elements as I could with the door cracked open a couple of inches the entire time. Be careful! Vapors could ignite causing fire or worse! Better be prepared for trouble if using a regular oven, do so at your own risk.

When using this technique by leaving the glass or bowl completely undisturbed while the naphtha is being heat evaporated. While evaporating the heavier salvinorin crystals will all fall to the bottom of the bowl while the lighter waxy chlorophyll containing impurity forms an upper crust on top. Once all of the naphtha has been completely evaporated out of your extract and allowed to cool you can peel the dark paper thin layer off the top to expose nothing but golden colored to light green high purity sand-like salvinorin crystals in the bottom of your glass. They might not seem like crystals unless seen under magnification, but they are.

Note: I stumbled upon method three as a complete surprise when I was experimenting with water extractions of leaf for an hour in boiling hot water, then removing the leaf and evaporating the water off all the way down to dry tannin and fine sediments which was then extracted using 99% IPA to recover the salvinorin lost to the water, about 50%. I then removed the fine sediments from the IPA through settling and after evaporation cleaned the extract solids with naphtha as well as I could. After drying the naphtha cleaned extract I then did a water wash of the powder just to be sure I had removed all of the tannin and then after pouring the water off dried the extract. As an added measure, just to make sure the extract was clean enough I added about an ounce of naphtha to it and stirred the powder into the solvent to see if it would take on any more color, which it didn't, so instead of pouring the naphtha off I just put it into an oven set to 125 F. to evaporate and was later surprised to find nothing but crystals under a thin crust of dark chlorophyll colored waxy lipids. These crystals could not have formed within the naphtha itself because salvinorin is insoluble to naphtha, so the crystals had to have come straight out of the extract itself, having formed when the 99% isopropanol was being evaporated down to a dry extract. Prior seeing this, I didn't know that the dark black wax deposited upon evaporation of the extraction solvent had crystals in it and as far as I know neither did anyone else.

This method has not worked for everyone who has tried. You can obtain high purity salvinorin crystals through this method if washing every bit of the green possible out of the extract using nothing but naphtha, but heat evaporating the extract in naphtha does not always form a crust on top of the bowl and an amount of impurities often remain mixed in with the crystalline material. I am still experimenting to find the way to make this method work for everyone.

### Photographs from method one:



These crystals were sent in for analysis and were found to exceed 99.5% purity using HPLC without any other peaks showing. *Note: Due to concerns that the ester rings of the salvinorin molecule might be hydrolyzed when boiled in 151 Proof ethanol I have since started using 191 Proof ethanol instead which is close to 5% water.*

I grew the crystals in the above photograph by dissolving 900 milligrams of refined salvinorin powder (light green color) into 100 ml of hot 140 degree F. 151 Proof Everclear® drinking alcohol (ethanol) and then set aside for two hours at room temperature each time to see if crystals formed. I had to go through three cycles of heating and cooling before these beautiful crystals appeared. The first three times through only a cloud appeared composed of extremely small crystals not visible to the eye except as a cloud. On the fourth heating I came back two hours later and found these beautiful large crystals had formed. When heating your alcohol thoroughly shake or mix the salvinorin powder into the alcohol to dissolve as much as possible. Keep adding salvinorin to the hot fluid until I will no longer dissolve any more and has a few specks of solid salvinorin in the bottom which won't completely dissolve to indicate that you have fully saturated the hot alcohol. When the ethanol cools back down to 68 degrees F. (20 C.) sometimes salvinorin crystals will precipitate out of the fluid because the alcohol cannot hold nearly as much salvinorin when cooled down to room temperature. Just leave it alone and let it cool down to room temperature setting on a shelf, nothing special needed.

I have used 99% isopropanol to grow crystals this way too, but they are always much smaller than when using ethanol. Acetone won't form crystals for me at all, methanol will sometimes form larger crystals than ethanol but hasn't been as reliable for me compared to 151 or 191 Proof Everclear® alcohol which usually takes three or four cycles of re-heating before nice crystals form. I have been able to grow crystals in 151 proof ethanol the same way using a much smaller 30 ml vial of hot alcohol with as little as 100 mg of salvinorin producing the same size of crystals.

*Note: Reheating the fluid several times over to produce larger crystals means more loss so use as few heating cycles as necessary and use as little ethanol as possible too. This can be assured by slowly adding salvinorin to the hot fluid until you can no longer dissolve any more into it.*

### **Photographs from method two**

The following two pictures are salvinorin crystals which formed through slow evaporation of acetone at room temperature. These crystals were produced by adding white salvinorin powder into a small bowl full of acetone warmed to a temperature of about 125 degrees F. then stirring in as much salvinorin powder that could be dissolved into it and setting it aside for a week. When I came back I found these crystals. Sometimes crystals will grow, other times none will form at all. The second picture was taken close up using a zoom stereoscope set to 45X magnification. The light brown colored material at the base of the crystals is fine sediments which were not removed from the salvinorin powder like I should have done.

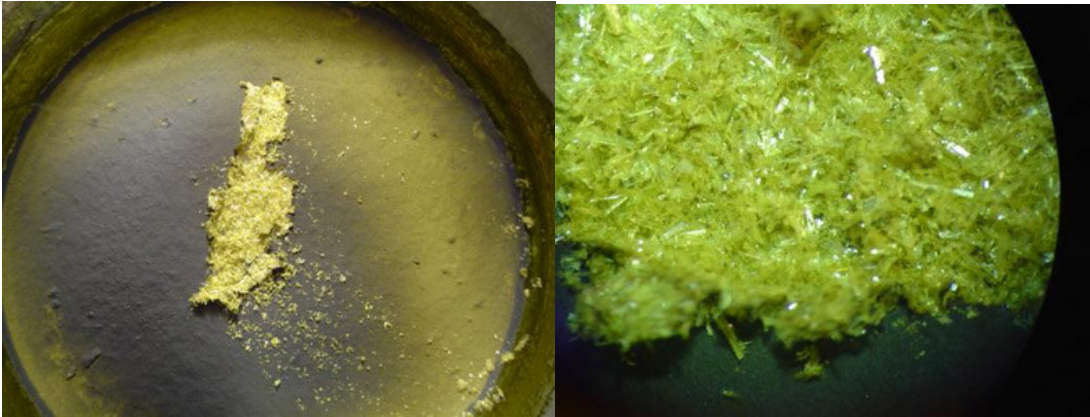


(Continued below)



### Photographs from method three:

The following pictures are salvinorin crystals obtained straight out of dried chlorophyll waxes from a 99% IPA extraction. The photograph on the left was taken on macro within about three inches of the bottom of a regular drinking glass used to evaporate naphtha cleaned extract that had about a half inch of clean naphtha stirred in just before placing the glass into an oven for evaporation. The smooth layer you see is a waxy crust of chlorophyll waxes which formed on top of the salvinorin crystals below it. I tore a portion of the wax off the top to show the crystals underneath. The photograph on the right was taken with a zoom stereoscope set to 25-30X magnification.



If you would like to see over 100 pictures of salvinorin crystals join this group and go to the photo files: <http://groups.yahoo.com/group/salvinorin>