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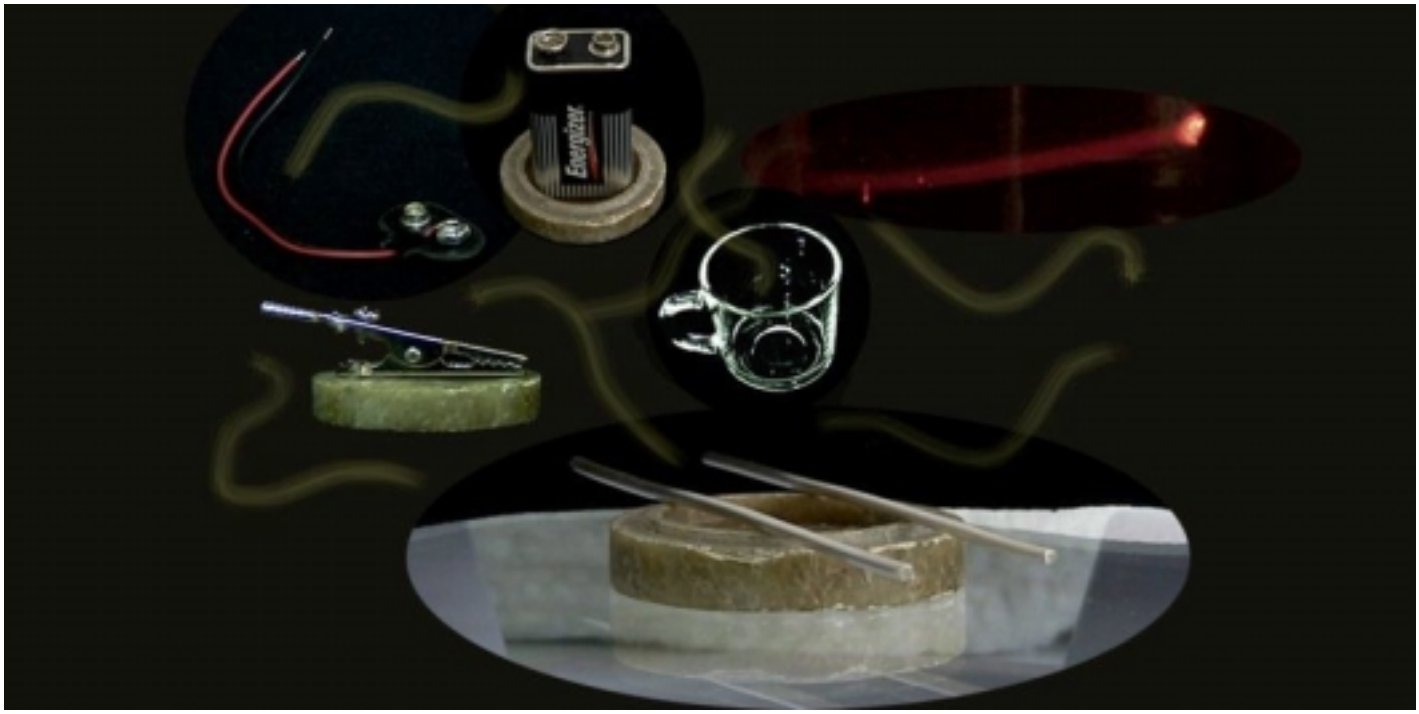
The Basic Colloidal Silver Generator

Supplies Needed to Create a Low Voltage Direct Current Generator

This tutorial provides a detailed explaination of all of the parts needed to construct the most basic colloidal silver generator possible. The material provided in this entire tutorial provides the means of creating a basic generator that anyone can safely create, with no technical or electronics experience needed. Please keep in mind that the basic generator creates a product that is inferior to more advanced production methods. We have found, however, that the basic generator, when the instructions are followed, produces an effective colloidal silver.

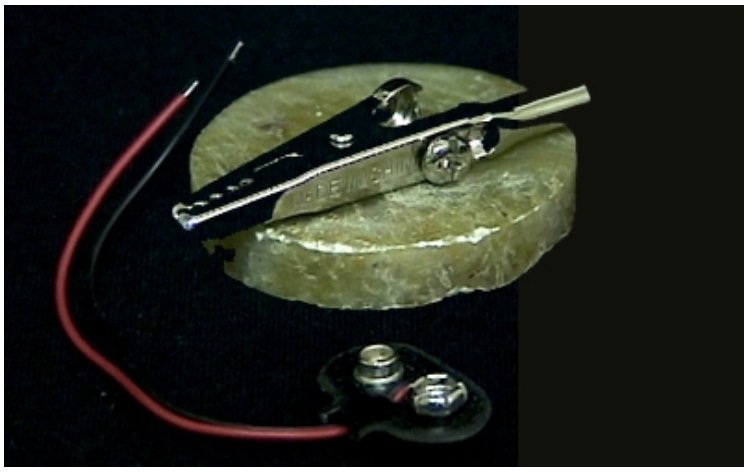
The Basic Colloidal Silver Generator



Supplies Needed for Colloidal Silver Production

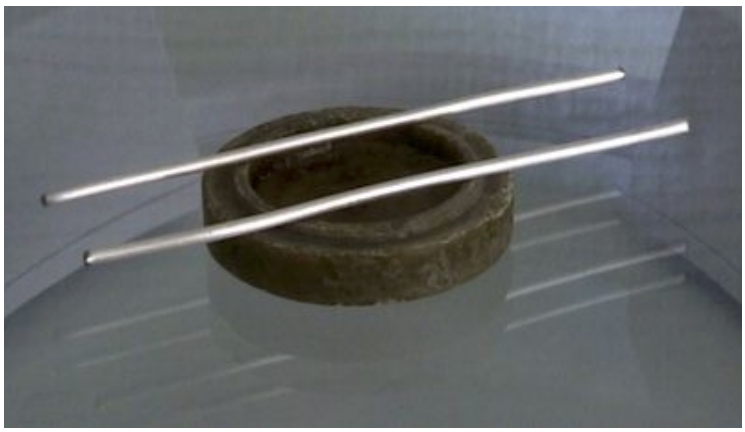
Four nine volt alkaline batteries are needed to achieve the desired 30 volts of electricity. Although four batteries in series total 36 volts, the drain on the batteries brings the total voltage down. See the advanced basic generator pages for modifications to control the current/voltage output.

Two nine-volt battery-to-clamp adapters, and two metal clamps.



One glass beaker or container that comfortably holds eight ounces of fluid

Two fine silver rods (9 cm rods shown, minimum 14 gauge) or two strips of 18 gauge fine silver wire. Any silver used must be at least 99.9 percent pure.



Additional Supplies Needed for Colloidal Silver Generation

" One gallon of distilled water (Walgreens and Arrowhead are two recommended brands)

" A roll of pure white paper towels

" One pure nylon scrub pad (the green Scotch Brite pads)

" A glass container to store the colloidal silver in (UV protected glass is recommende)

The Basic Colloidal Silver Generator

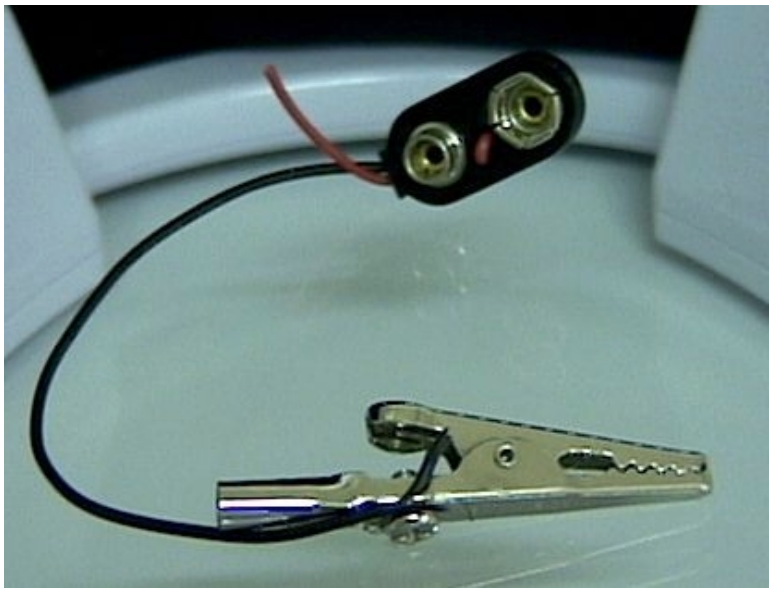
Part Two: Building the Basic Generator

This tutorial (part two) provides a detailed explanation on how to build the basic low voltage, direct current colloidal silver generator. Having obtained all the parts necessary for construction, assembling the colloidal silver generator will take about 15 minutes.

Generator Assembly

Attach the clamps to the battery leads: Attach one metal clamp to the red (positive) wire of the nine volt battery-to-clamp adapter, and one clamp to the black (negative) wire of the second lead adapter. Simply strip enough of the wire casing off of the wires to ensure that there is enough bare wire exposed to securely attach the lead to the clamp.

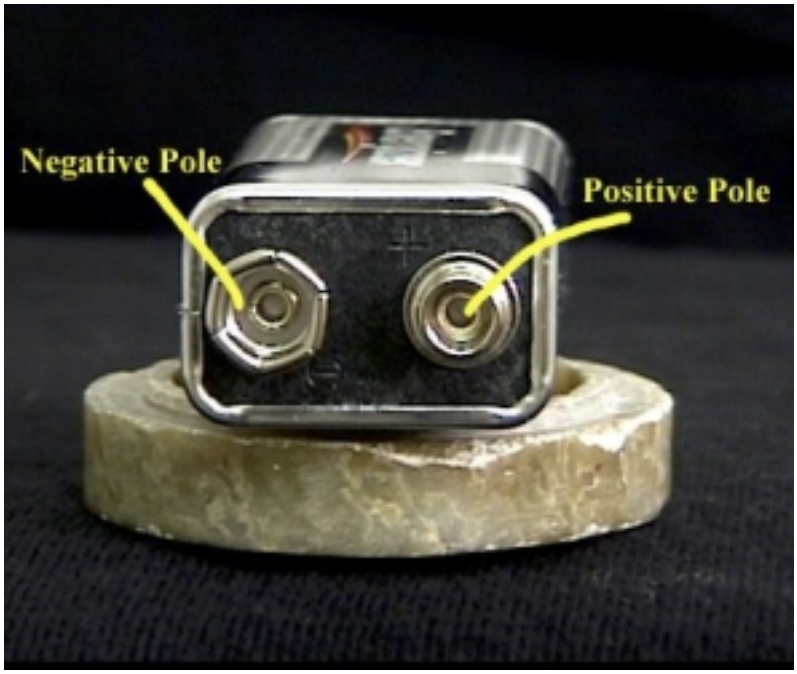
Clip off the unused lead: For convenience, cut off the unused battery lead on each clamp attachment. See the image below:

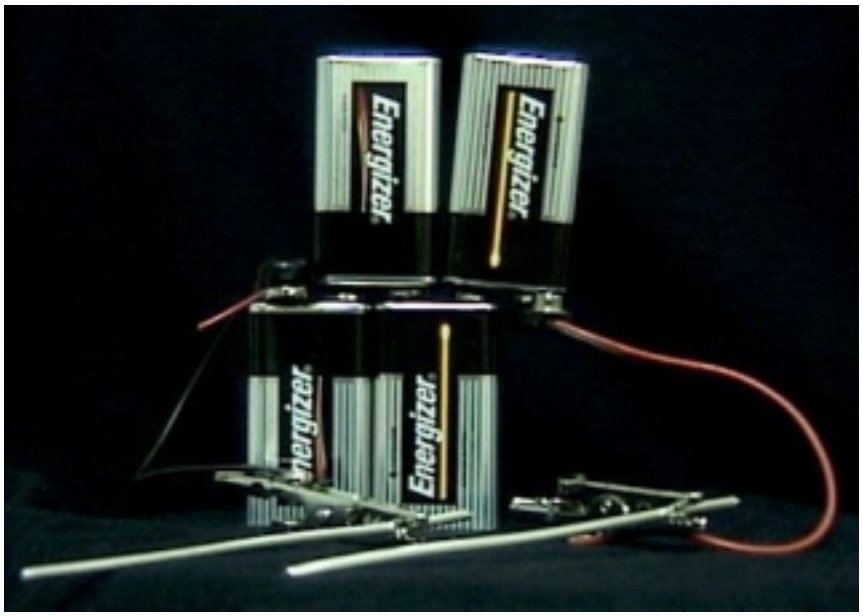


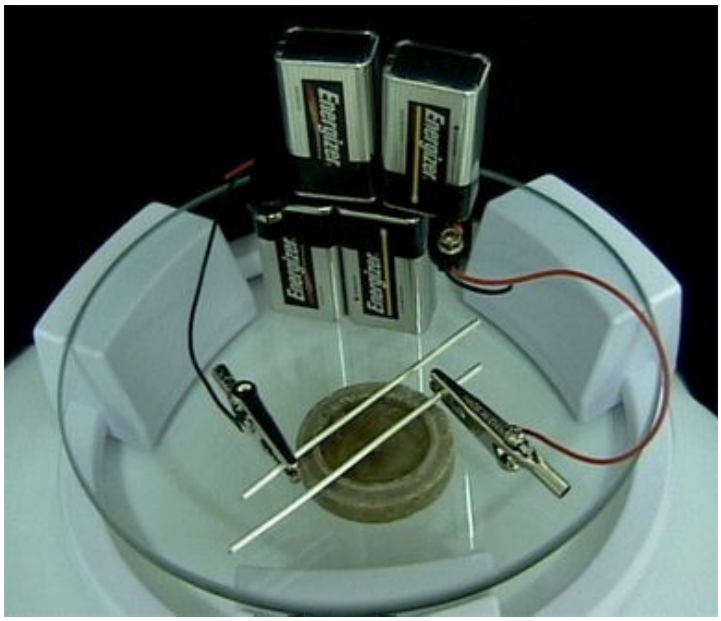
Attach the battery pairs: Take two nine-volt batteries and snap the positive pole of one to the negative pole of the other (there is only one way this attachment will work). Repeat the process for the second set of batteries. The end result is two sets of two batteries attached to each other:

Attach the two battery sets together: (Do not perform this step until you are actually prepared to make your colloidal silver. Once the four batteries are attached a circuit has actually been completed.) Take the two battery sets and snap them together. The end result is four batteries attached together, which completes actually completes a circuit.

Completing the hookup: The final step is to attach the battery leads. Attach the positive (red) clamp/lead to the exposed positive pole on the batteries. Attach the negative (black)clamp/lead to the exposed negative pole of the batteries. To test the connection, tap the two clamps together to see if a small spark is generated. There is only one way of attaching the leads to the batteries, so do not be concerned about not attaching them properly.







The basic generator is now complete. The only remaining step is to prepare the glass and rods for use.

The Basic Colloidal Silver Generator

Part Three: Principles of Colloidal Silver Production

This tutorial (part three) provides the three critically important principles behind colloidal silver production, and provides the theory and basic knowledge needed to create a quality silver product-- especially when one later decides to improve the quality of the generator.

The Basics of Colloidal Silver Production

Three Principles to Mastering Colloidal Silver Production

1. **Purity:** The quality of any colloidal silver batch is foremost determined by 1) the purity of the silver used, 2) the purity of the initial water supply, and 3) the cleanliness of both the silver rods and the glass container used for production. Even variables such as air quality and light concentration can influence colloidal silver production.

2. **Current Control:** The entire colloidal silver generation process is geared toward strict regulation of the flow of silver (both ions and particles) into the distilled water base. The more command one successfully wields toward this end, the higher the end quality

will be. Variable conditions include everything covered in the purity principle, plus: a) The voltage applied, b) the amount of current, c) the size of the silver electrodes, d) the amount of water used, e) the water temperature, f) the size and shape of the container, g) the spacing between the silver rods, h) the motion (if any) of the water in the container, and even i) the Earth's electromagnetic field and j) the shape of the silver electrodes.

3. **Timing:** Understanding and properly measuring the duration of each batch of colloidal silver is of paramount importance both to the particle size of the silver ions and the concentration of the batch itself, and thus critical to the end quality of the product. All variables of the timing are dependent upon the variables of the first two principles. Timing influences particle sizing and particle dispersion (otherwise known as proper hydration of the silver).

Each of these three principles relies upon the other. Mastery of these simple principles equates to the mastery of colloidal silver production. Every advanced colloidal silver generator IS advanced due to the fact that it addresses one or more of these principles more successfully than the basic generator is able to. Some "advanced generators" defy the above principles, and the end result is always a lower quality product. These production flaws can only be detected by expensive analysis of the end colloidal silver, including both Atomic Adsorption Spectronomy (AAS) and Transmission Electron Microscopy (TEM).

The Basics: Demystifying Colloidal Silver

What is Colloidal Silver?

Simply stated, colloidal silver is water containing both microscopic particles of elemental silver and silver ions. The most common electrolysis processes used to create colloidal silver sinter metallic silver from a silver rod or wire, and deposit ions (Ag+) and particles (particles with no charge and clusteres of charged particles, Ag-) into the water.

What separates colloidal silver from other types of silver products is the fact that the state of silver is either in isolated ionic form or pure particle form (not bonded with other elements), and the size of any silver particles is incredibly small compared to other methods of silver production. In other words, the silver ions and particles are isolated by water molecules only. Whether the benefit of colloidal silver is due solely to the silver, the size of the silver particles, the ionic charge or particle charge, or a combination of all three, is a matter of debate. Please keep in mind that the term "colloidal silver" should be considered a generic term and not a scientific one, as colloidal technically means particles in suspension, not dissolved solids.

How is quality gauged?

Therapeutic quality of colloidal silver is determined by 1) the product purity 2) the size of the silver particles, 3) the concentration and/or ratio of ionic silver to particle silver, 4) and both the dispersion of silver in the water and the surface area that active silver area covers (which is related to the size of the silver particles).

One of the greatest motivating factors for manufacturing one's own colloidal silver is to ensure product purity. By using inferior silver or thoughtless bonding agents (even accidentally), it is just as easy to toxify the body as it is to heal it. For instance, Silver Nitrate is a known toxic substance, and silver chloride has questionable benefit in the body. While it is true that even the poorest quality colloidal silver available for purchase is unlikely to contain enough contaminants to do the body serious harm, it is equally true that ANY contaminants cause the formation of larger silver particles and silver compounds. This may significantly decrease the benefit possible compared to a properly made colloidal silver.

Using the production methods on these pages will ensure both a safe and effective colloidal silver. However, it should be noted that home brewing colloidal silver can only be taken so far without a sterile lab environment and incredibly sophisticated controls. That said, just because a colloidal silver is "lab made" does not mean that the producers are making it properly!

The size of silver particles is important for three reasons:

The smaller the particle size, the more likely the colloidal silver will be adsorbed in a useable form by the body. A high quality colloidal silver solution should have particles small enough to be adsorbed sublingually and through lung tissues.

Small particles minimize (or eliminate entirely) the amount of silver build up in dermal tissues. The infamous condition of argyria, is caused by large amounts of silver (usually from silver proteins or silver salts) deposited in skin layers.

Finally, small particles of silver cover a greater surface area, increasing the potential contact with microbes.

Ionic silver is a whole field unto itself. A high quality colloidal silver has ionic silver that does not readily agglomerate.

By properly making colloidal silver with the basic generator, particle sizes between .001 - .04 microns may be uniformly achieved (with concentration strength between 3 - 5 parts per million) - a good colloidal silver.

The concentration strength is the amount of actual silver contained within the water by volume, and is measured in ppm (parts per million). Five parts per million is generally accepted as a safe and effective general purpose strength. However, a 5ppm solution is not universally regarded as effective. Generally speaking, one may achieve a suitable quality 50 ppm solution using a more advanced generator. The basic generator, with practice and extreme care, can safely generate a batch (estimated) of about 10 - 12 ppm, although there will be a quality difference as compared to a batch of 3-5 PPM.

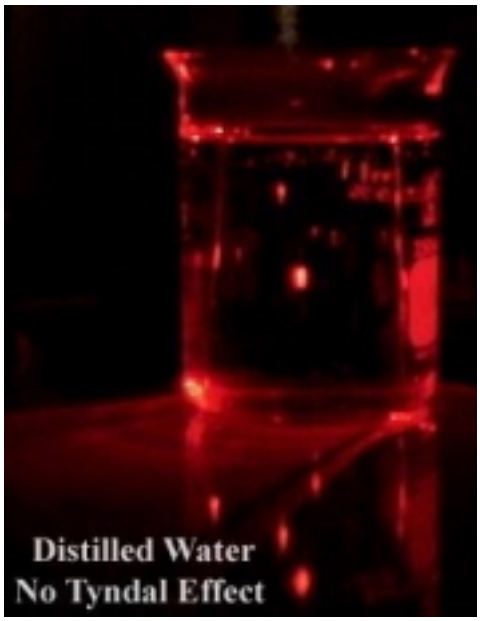
With all of these variables, and without lab equipment, can one be certain to achieve a quality colloidal silver with a basic generator?

Yes. The primary purpose of this tutorial is to introduce colloidal silver to the interested novice. The following instructions will provide both the method of achieving a safe and effective colloidal silver solution and a method of testing it. After experimentation, and with continued interest, one may wish to explore a more advanced generator.

Using the Basic Colloidal Silver Generator

Part Four: Colloidal Silver Production

This tutorial (part four) provides the instructions for using the colloidal silver generator. Please note that there are very good reasons for each step in the process, including keeping the silver rods smooth through proper cleaning between batches. The instructions below provide specific details on producing a batch of 3 - 5 PPM colloidal silver.



Preparing the Materials

1. Use the nylon scrub pad and dry scrub the inside of the glass container used in the generator.

2. Rinse the container thoroughly. Use a clean paper towel to dry the container. Rinse a second time with a small amount of distilled water.

3. Always scrub the silver wire or rods with a nylon scrub pad before use. To save silver, use light pressure and agitate quickly. The smoothness of the electrodes will help to ensure a uniform draw of ions from the silver rod.

4. Wipe off the rods with a clean paper towel soaked with a small amount of distilled water.

5. Make sure one's hands are clean.

6. Assemble the colloidal silver generator as previously described (attaching the two battery sets together).

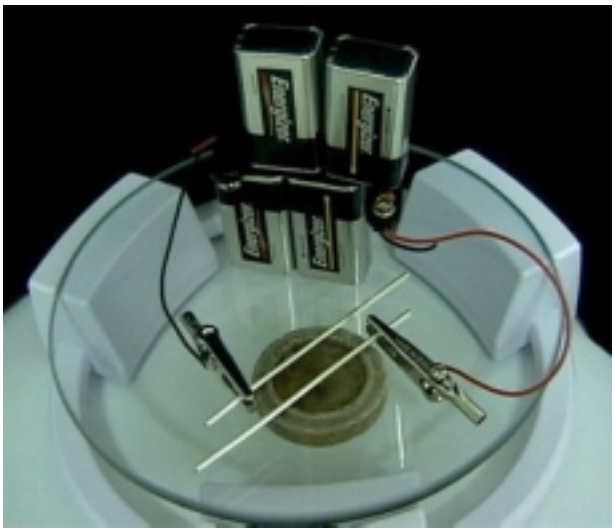
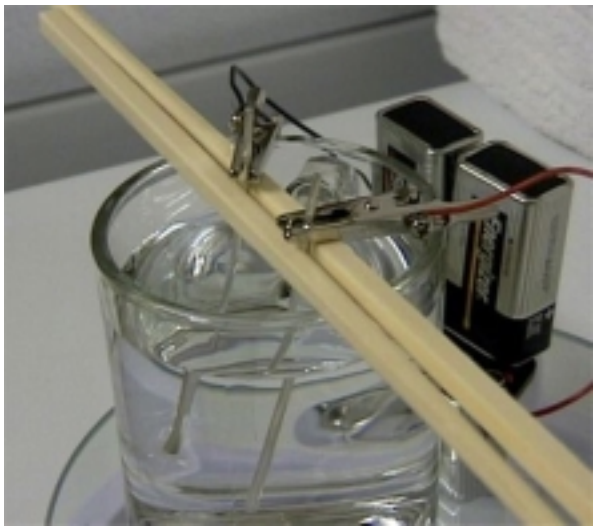
7. Add approximately eight ounces of distilled water to the glass container.

Preparation is complete. Clamp the silver rods to the battery setup. Any clean, non-reactive substance may be used to help position

the rods above the container. See the following picture for an example.

NOTES:

Nylon is used for two reasons: 1) It is a non-reactive substance and any accidental contamination will not interfere with the reaction. 2) It is a nontoxic substance.

Position the battery setup so that both attached rods may be easily inserted in the water. For optimum performance, the spacing between rods should be between 1.5 and 2.0 inches. The rods should be positioned as close to the center of the container as possible to prevent increased conductivity generated along the rim of the container.

Position the rods parallel to each other. This encourages uniform conductivity between both rods, and therefore a uniform draw of silver. The positive and negative leads/rods should never touch each other.

Once the rods are positioned correctly, note the time. As the batch progresses through the first 10 to 15 minutes, very little change should be apparent. As the fifteen minute mark approaches, pay particular attention to the reaction.

Anywhere between 15 and 30 minutes, one should notice a thin yellow cloud or a yellow "wisp" drifting between the electrodes. This indicates that the saturation of silver ions between both rods is reaching a point of ideal saturation. Mark the time.

Allow the reaction to continue for five minutes. Then, very carefully, remove the "negative" rod from the water. Wait about two minutes. Gently remove the positive rod from the colloidal silver. Increasing the time will increase the concentration of the end colloidal silver. However, be aware that one risks degrading the product. One can use a Hanna PWT meter to measure the ionic content of silver (as well as the initial quality of the distilled water). A laser pen in a dark room can be used to gauge the amount of particulate silver in the end product.

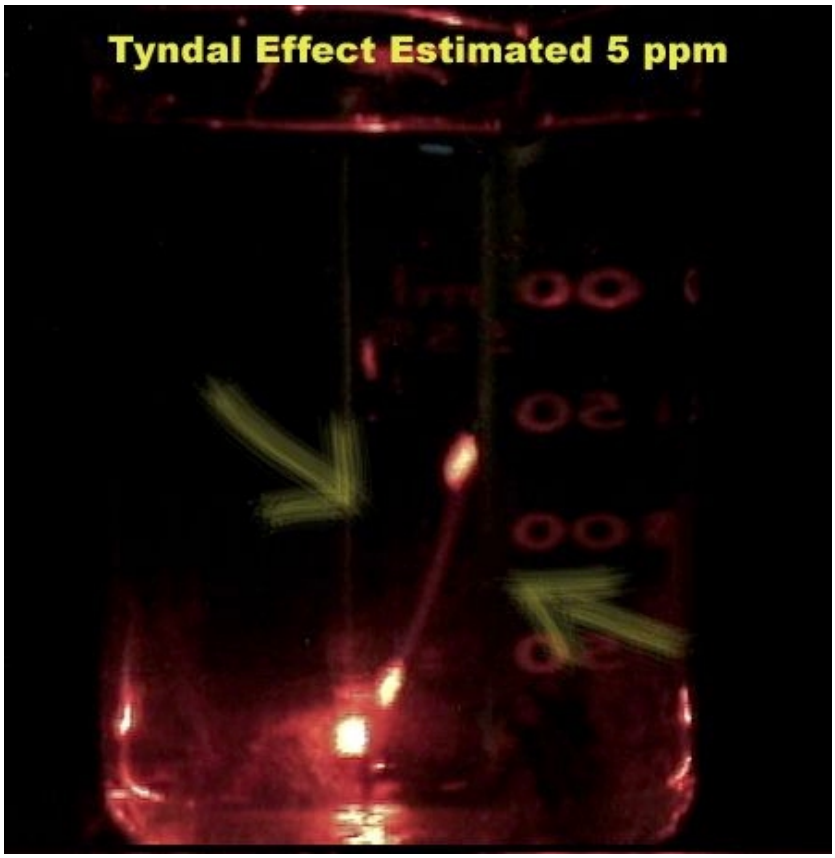
One may notice the remaining yellow wisps slowly dissipating. As time progresses, the colloidal silver will retain its "water" clear color. No visible particles should be present. Increasing the production time will eventually result in a colloidal silver with a yellow hue.

Although with this method, every single batch will have a variable PPM reading, if the above instructions are followed, the end product silver concentration will be 3 to 5 parts per million. The sizing will be between .001 and .04 microns in diameter.

At this point, it is very advantageous to acquire a simple laser light pen. It is a wise practice to both check the quality of the distilled water before a batch, AND to test the colloidal silver once the solution has "matured" a few hours.

See the next section for further information and notes on the process itself.

Images



Using a laser pen to detect particle density in a 5ppm CS solution

Estimated 50 PPM

The Basic Colloidal Silver Generator - Important Notes

Part Five: Commentary on Colloidal Silver Production

This document (part five) is a commentary providing technical details on the colloidal silver generation process with the basic generator.

Final Notes on the Colloidal Silver Generation Process

A Closer Look at the Generation Process

When both silver electrodes are placed in the distilled water, an electrolysis reaction begins. *Electrolysis* is the producing of chemical changes by passing an electrical current through an electrolyte. In our case, the electrolyte is the distilled water. While distilled water has very

One will notice that at first, no visible reaction is apparent. This is due to the fact that distilled water, a VERY low semiconductor of current, allows very little travel of electrons between both silver rods. It is the travel of electrons that sinters off the silver into the distilled water. The less the conductivity between the the electrodes, the slower the reaction.

From the moment an actual circuit is completed (by placing both rods in the water), electrons DO, however, begin to travel from the negative pole to the positive pole, passing through the distilled water. Through the process, the metallic silver atoms gain an electron, and thus ionic silver (Ag +) is created. As the process continues, increased conductivity also caused charged particles to form in the water (Ag -). Since distilled water heavily restricts this travel, the amount of current traveling through the solution is very low. This is ideal. It keeps the reaction at a bare minimum, which in turn produces the smallest possible particles of silver, and a "theoretical" ideal ionic silver. The greater the current traveling through the water, the faster the reaction takes place.

Any increase in the speed of the reaction results in the production of LARGER particles of silver. Keeping the current well below 40 milliamps (ideally between 5 - 20) helps to prevent agglomeration.

As the minutes pass, one will notice a slight discoloration on both rods. This is a good indication that the reaction is proceeding as desired. On the negative terminal (the cathode), neutral silver (silver with no electrical charge) begins to plate the silver rod. As the reaction continues, one will notice small bubbles forming and rising off of the silver rod. This is H2, a simple and harmless hydrogen gas. On the positive terminal, as the reaction continues, one will begin to notice the buildup of "sludge", as it is often called. This is actually silver oxide (dark brown). While this silver oxide is relatively harmless, it is undesirable to have silver oxide or silver flakes in the end product (for internal use colloidal silver). To avoid this, pay close attention to the purity principle listed on a previous page. Avoid overrunning or "over burning" the batch. Leave the "positive" electrode in the solution for a few minutes after the removal of the "negative" terminal to allow the sludge to oxidize a bit. By doing this, when the sludge covered rod is gently removed, the sludge will stay adhered to the rod and not drop off into the solution.

By the discoloration of the rods, it is evident that a reaction is indeed occurring. Colloidal silver is actually being produced from the first moment, although the concentration is not great enough to been seen by the naked eye. As time passes, the reaction begins to speed up. The silver ions, being dissolved, increase the conductivity of the water. In turn, more current travels between the two poles. This, of course, increases the amount of silver ions being siphoned (or sintered) from the silver rod.

There is a very definite point in this process where the speed of the reaction causes LARGE nonionic particles of silver (sometimes referred to as sparklies) to be deposited into the end solution. That is why both purity and timing are important elements in producing a quality colloidal silver solution, especially with the basic generator.

At this point, it is interesting to note the reason behind the idea of using a 30 volt power source. Experienced practitioners in this colloidal silver generation method have discovered that the the silver electrodes burn cleanest using 30 volts of electricity. There are numerous ways to refine the colloidal silver generation process, and these will be dealt with in other sections of the website.The timing indicator to watch out for is the first sign of golden "wisps" in the solution. This indicates that there is an EQUAL dispersion of electro-colloidal silver particles, usually sized between .001 and .01 microns, in the area in which this yellow color is visible. Silver particles adsorb indigo light between this size range and therefore reflect yellow. Extensive testing conducted through electron microscope photography (through trial and error batch testing) has shown that once the first sign of yellow wisps appear, a 3-5 ppm solution is created if the reaction is then stopped five minutes from the initial observation. This is dependent on using about eight ounces of room temperature distilled water, and careful observation of the purity principle and all of

the suggestions mentioned on the previous pages.The longer the batch runs after this "rule of thumb" point, the greater the risk of producing large particle of silver.

Once the electrodes have been removed, cover the top of the container, and allow the batch to sit for a few hours, preferably in a dark storage area. Test the batch, if possible, with a laser light pen in the dark. A light "tyndall" effect will be observed. Search the solution for bright shining "sparklies" floating in the water. With practice, one can easily produce a sparklie free colloidal silver batch. If large, bright particles ARE observed, avoid filtering if at all possible. Instead, use a needless syringe or other similar process to transfer the colloidal silver from one container to another. If proper care is taken, the new container will not contain the large particles. One may use any leftover colloidal silver in the original container for topical applications with no risk.

For those interested in reaching toward perfection: Careful study of an average (as apposed to superior) batch with a laser pen reveals the following: 1) Possible very tiny flakes of silver floating on top of the solution. Siphon off the top portion. 2) Theoretical larger particles that settle toward the bottom third of the solution. Use the bottom portion of each batch for non-internal uses.3) Possible small particles of silver free floating in the water ("sparklies"). Slowly extract the desireable solution with a needleless syringe. Retest batch.

Countless people have used far less stringent guidelines, drinking the colloidal silver on a daily basis for years with no adverse effects. These guidelines are provided to give the interested novice a strong knowledge base to start from. It is a wise practice to store colloidal silver in a UV protected glass container. However, most practitioners agree that a high quality solution will be fine in any glass container. Many people store their colloidal silver in plastic and report no problems. Periodically, check a stored batch of colloidal silver for "fallout" on the sides and the bottom of the container. In fact, it is interesting to store a "good" batch in a see through glass container, and observe any changes occurring over time. This will give one a strong indication on the quality of the colloidal silver being produced. After setting "overnight" the completed batch should either maintain it's clear color, or have a slightly yellow tone. However, please keep in mind that if needed, the colloidal silver can be used immediately after production.