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# 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.

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  $H_2$ , 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 be 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 "tyndal" 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 needleless 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 desirable 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.