

## COLLOIDAL SILVER

Colloids are submicroscopic particles of material suspended in a liquid. Silver is converted to colloidal silver by running a positive electrical current through bars of pure silver suspended in water. The size of colloidal silver particles is generally between .015 - .005 microns. Upon becoming a colloid, silver takes on a positive ionic charge.

The mechanism by which silver accomplished the disinfection of bacteria was first termed "oligodynamic" referring to the fact that it's qualities may be observed even when present only in extremely limited quantities. Silver reacts strongly with thiol (sulphydryl, SH) groups in both functional and structural proteins of the bacterial cell. Research indicates that silver inhibits glucose, succinate, and lactate oxidation (dehydrogenation), possibly by means of an uncoupling effect. Zimmerman (1952) had already demonstrated that low concentrations of silver do not enter the cell. Rather, they are adsorbed onto the bacterial surface just as silver tends to adsorb to other surfaces thus silver ions immobilize dehydrogenation because respiration occurs across the cell membrane in bacteria rather than across the mitochondrial membrane as in eukaryotic cells.

Prior to 1938, when patentable antibacterial drugs began to be developed, colloidal silver was a mainstream antibacterial agent in the US. It is still widely used to prevent scumming in water storage tanks. It is used to sterilize water aboard NASA's Space Shuttle program. Many airlines companies routinely use colloidal silver for in-flight water purification. Today interest in colloidal silver as a powerful home remedy, as well as an effective water purifier, is at an all time high.

Many colloidal silver enthusiasts recommend this material as a safe topical and internal cure-all for a wide variety of maladies. Some encourage daily ingestion of colloidal silver as a preventative measure. Others warn consumers of self-interested marketing efforts designed to cash in on whatever the latest personal health fad might be. Warnings are posted as to possible toxic side effects which could result from the buildup of silver in the bloodstream.

Potters for Peace takes no position on the claim of colloidal silver's effectiveness as an antibacterial agent to be directly ingested in relatively large daily, or regular doses. Our interest is strictly focused on the historical and well-documented application of colloidal silver as a safe and effective water purification agent used in conjunction with various filtration and storage methods for both large and small water systems.

Colloidal silver is not listed as a toxin by the Environmental Protection Agency's Poison Control Center. Likewise, the Food and Drug Administration has no regulations regarding the use of colloidal silver as an antibacterial in any form or method, although due to the recent upsurge of interest in this material, many believe some sort of guidelines will be forthcoming.

The toxic side effect, mentioned previously, resulting from a buildup of silver in the bloodstream is known as "Argyria;" a blueish-grey discoloration of the skin. Medical science recognizes Argyria as specifically caused by intensive long-term exposure to silver compounds, such as silver nitrate, silver sulfate, silver sulfadiazine, etc., not from micro-particles of ionic silver.

The Filtron employs colloidal silver through a one time initial saturation of the filter medium by a .32% solution in approximately 200 grams of water. See Test Request for application details. It is highly recommended that the filter medium be periodically cleaned (at least annually in case of high turbidity levels in the source water) and re-saturated with colloidal silver. On-going studies are focused on determining a more or less exact timetable of filter medium renewal, but the longest (albeit unscientific) study yet indicates that after 15 years the filter is still doing it's job.

Although the total amount of colloidal silver used in the Filtron is relatively minute, it is still possible that even smaller trace quantities of the material could pass directly into the filtered water. To date, no medical study conducted on colloidal silver has indicated that it poses a threat to human health. In his "Case Study of 30 Years of Use with Silver Disinfected Drinking Water" (1983), Michael Owen states that "Colloidal silver does not appear to be readily absorbed by the human body. Excess silver deposited in the stomach is precipitated as silver chloride by the stomach bile, and almost immediately excreted through the feces."

For a more detailed description of the properties of colloidal silver, refer to the following documents; "A Closer Look At Colloidal Silver," by Peter A. Lindemann, and "A Brief History of Colloidal Silver," by Dr. Gary Smith; "Antimicrobial Activity and Action of Silver", *Progress in Medicinal Chemistry*, Hugo Russel, Elsevier Science B.V. Vol 31, 1994; *Drinking Water and Health*, Vol. 2 National Academy Press, Washington D.C. 1980.