

# The Ultimate Silver Ozone Water

## BIONAID TRIOXYSILVER PRODUCT And the Oxygenated Silver Hydrosol Molecule (OSHM)

- Classical colloid science deals with dispersions for which at least one dimension of a dispersed phase falls within about 1 and 1000 nm (0.001 to 1 micron). (In applied colloid science the upper size limit is commonly extended to at least 10,000 to 100,000 nm. (10 or 100 microns))
- In the case of colloidal silver, it is solid particles (of silver) in a liquid (water). It is not in fact a suspension, as the definition of a suspension is particles larger than 1 micron (1,000 nanometers) while colloidal particles are defined as 1 nm to 1,000 nm and a solution (ions) is defined as particles less than 1 nm in diameter. An ion or atom of silver is about 1/4 nm diameter. One nm being a billionth of a meter or 1/1,000th of a micron (millionth of a meter).
- Thus, the largest allowed colloidal particle of 1,000 nm would contain about 45,000,000,000 atoms or ions of silver ( $D^3 \times \pi/4$ ).
- The ideal then, is to have as many ions as possible, since they could yield as many as 45 billion times more discrete particles, enhancing bio-activity from both quantity and size aspects. The more typical, large colloidal silver particle of 200 nm would contain 380 million ions or atoms. BHI's OSHM product is over 99% ions but in practice most ionic silver solutions and colloidal silvers have far less, due to lack of understanding of what variables must be closely controlled to prevent formation of non ionic atoms, crystals or salts. Those that "salt" the water or "look for a cloud of ions" are doomed to producing very few to no ions of silver and thus "a very weak product.
- What is popularly referred to as colloidal silver is in fact usually a combination of ions (dissolved), atoms (colloidal), crystals (suspended but usually settle out) and salts of silver (rarely dissolved and usually settle out). Soluble silver salts, like silver nitrate, provide free ions of silver but also dangerous nitrate ions. In fact numerous silver hydrosols are not produced in a controlled reaction chambers and many do not control the mineral content or the dissolved gases in the water being used which can result in the production of silver nitrate, and other dangerous derivatives.

- The best bio-availability is from the ionic form, with rapidly decreasing biological benefits from the other forms, the ionic form being 300 times more effective to 17,000 times more effective than many silver salts. Put another way, you would need a daily dose of 1 to 30 gallons of colloidal silver or silver salts to equal one tablespoon of 3PPM OSHM. If you take one tablespoon of OSHM you will get nearly as many bio-available ions as you have cells in your body.
- A popular measure of the existence of a colloid, such as colloidal silver, is the Tyndall effect of "the dispersion of a light beam shown thru the liquid". A cloudy path of the light beam will be evident if there are colloidal particles in suspension. It is visible in colloids as weak as 0.1 PPM. Ions, the preferred form of silver, are NOT visible, even with a high powered microscope.
- Thus, a strong Tyndall effect is an indication of larger silver particles and thus less bioavailability while a weak Tyndall effect indicates more ions of silver, assuming you are comparing the same PPM.
- PPM, by the way, is a measure of "parts by weight", so it cares less if ionic, atomic, crystalline or salts of silver. Ion Specific Electrodes can measure the ionic particles only, while atomic absorption can measure them all. A centrifuge can separate out the particles of a colloid, leaving the dissolved ions. The common measurement of solution conductivity, using low cost PPM meters, will measure only the charged particles. These will include colloidal silver particles (atoms or clusters of atoms), silver ions and dissolved salts (which disassociate into charged ions), but will not measure any crystals or non-charged atom clusters. The measurement is in microsiemens/centimeter and for colloidal silver converts at 1.6 uS/PPM.
- With the vast majority of the market, silver ions are inherently produced, by low voltage electrolysis, but when they reach the negative electrode they gain an electron and become an atom of silver (non bioactive) and/or join to others to make crystals of silver. These are weak crystal structures, like snow flakes, and may fall off the electrode if disturbed.
- Also if current density (uamp/cm) is not controlled properly, there will be few ions stripped off the silver electrode and the disruptive energy will knock off mostly atoms or chunks (crystals) of silver. Further, if circulation is not used, a conducting string of ions/atoms will bridge between the electrodes and crystal growth will proceed in between the electrodes. This then leads to very high current density (point discharge of current), negating any current limiter (constant current) benefits.

- The measure of the stability of a colloid is the zeta potential or particle charge. It is a negative surface charge, unlike the positive ionic charge (due to loss of an electron) of ionic silver. Since like charges repel the particles stay separated, for good stability. It is possible to have both positive and negatively charged particles in a solution, just as salt disassociates into + sodium and - chloride ions. In the solvating action of water, ions are surrounded by micelle of water, greatly reducing their mobility.

- In summation, the ionic (positively charged) form will have the highest bio-availability and bio-activity of any form of silver. It can't be produced in high PPM due to the limited solubility of silver ions in water (metallic silver is not soluble in water but can be suspended in colloidal form). That is, when the saturation point is reached (about 15-20 PPM) precipitation will occur. Higher concentrations (to 500+ PPM) can be made if bound to protein, but the ions are surrounded and thus have their bioactivity masked, allowing mold growth on the protein surface.

- Unlike most ionic silver hydrosol, BHI's product is an oxygen-silver product which is produced in a highly controlled chamber to ensure the creation of pure silver ions and pure oxygen ions in an environment that facilitates the formation of the covalent silver-oxygen bonds found in Bionaid. The chamber this reaction occurs in is commonly referred to internally as the reaction chamber or the reactor because the covalent reaction between the oxygen (O-) and silver (Ag+) ions which produces OSHM happens inside of this chamber. Oxygen ions are both introduced and also are made available after the bond between hydrogen and oxygen is broken between some water molecules present in the chamber which releases the hydrogen as a gas. As the hydrogen bond is broken in the H<sub>2</sub>O each hydrogen atom keeps one electron with it leaving the oxygen atom without two electrons. The positive ions of silver readily bond to these negative ions of oxygen due to their opposite polarity.

- Stable oxygen that we breathe in every day is O<sub>2</sub>. O<sub>3</sub> is an unstable form of oxygen that has an extra electron looking to pair itself. This instability is what makes O<sub>3</sub> a universal cleaner. For example: lightning creates O<sub>3</sub> and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) in our atmosphere and in our water to help cleanse our planet. O<sub>3</sub> breaks down in water to (H<sub>2</sub>O) and (O<sub>2</sub>). In our Bionaid products, O<sub>3</sub> is stabilized by a covalent bond with the silver atoms creating the oxygen silver covalently bonded molecule. The combined antiviral and antibacterial properties of silver with the natural cleansing power of the O<sub>3</sub> makes our product one of the most powerful immune system boosters on the market today.

- Free Radicals are formed naturally within our bodies to clean up toxins. Free Radicals are often formed in excess today as a result of environmental pollutants as well as diets heavy in sugars and rancid oils. These excess free radicals snatch electrons from healthy molecules and are considered a primary cause of aging. The body needs help to supply these free radicals with electrons. Once these free radicals are supplied with an electron they can be eliminated from the body before they do further harm. The covalent bond of the O<sub>3</sub> particle of our oxygen silver molecules is easily broken once in the body and becomes available to satisfy free radicals by providing the needed electrons. Our product is therefore a free radical scavenger.

- “O<sub>3</sub> Selectively inhibits Human Cancer Cell Growth.” “...cancer cells are less able to compensate for the oxidative burden of ozone than normal cells.” O<sub>3</sub> inhibits cancer 40-60%, and up to 90% in a dose dependant manner, yet there is no response from mainstream medicine. *1980 Aug. 22nd Sweet F, Kao M S, Lee S-CD (Dep. of Obstetrics and Gynecology, Washington University School of Medicine, St. Louis, MO) & W. Hagar (St. Louis Air Pollution Control) Published in “Science” Vol. 209:931-933.*

- “... Oxygen is the most important healing substance, the most effective detoxification agent, the premium blood cleanser, the most potent antibiotic, a versatile hormone, a blood clotter and declotter, and the conductor of the orchestra of the immune system.” *Dr. Majid Ali, M.D. The Institute of Integrative Medicine, New York*

- “Pathogens, bacteria and fungi cannot live in a highly oxygenated body. The hundreds of different diseases named by allopathy (whether viral, bacterial, communicable, autoimmune or degenerative) are but symptoms of one underlying cause. That cause is hypoxia, or oxygen starvation at the cellular level, leading to internal toxicity.” *Two-time Nobel Prize Winner, Dr. Otto Warburg M.D., PH.D.*

- O<sub>3</sub> is such a powerful therapeutic tool because it deals with the underlying cause through both oxygenation and oxidation. O<sub>3</sub> taken on a regular basis in the home will, over time, safely clean all the fluid of the body, and furnish an oxygen-rich environment for all the cells in the body, providing high levels of immunity from most common diseases.

## **PHYSIOLOGY OF PRODUCT CONSUMPTION DELIVERY AND EXCRETION**

- Life would not exist if soluble minerals including highly reactive ions such as silver ions did not have a safe means of transport into and in your blood stream.

- The body however can not process raw metallic crystals such as colloidal silver. The only health benefit in taking colloidal silver is due to the fact that even colloidal silvers usually contain at least some bio-available silver ions. However, while body electrolytes can release a few ions of silver from metallic silver i.e. colloidal silver it is far from the benefits of the direct oral intake of trillions of silver ions establishing a therapeutic dose in the blood. At 6PPM a tablespoon of our oxygenated silver hydrosol contains over 120 trillion ions which is more than the total number of cells in the human body. These ions are transported into the body by Metallothionein (MT) a relatively small molecule that binds heavy metals including silver, cadmium, iron, copper and zinc, and is made by most cells in our body.
- In humans, metallic ions, either free or disassociated from dissolved soluble salts are immediately isolated by ligands in the saliva, usually metalloproteins such as Metallothionein, and a large number of these ions are absorbed directly into your body through the mucus membranes of the mouth and esophagus prior to reaching your stomach. Your saliva has over 200 different proteins and fully one third of body proteins are metalloproteins i.e. carrying metallic ions. Thus, reactive ions (missing one or more electrons) are transported past the stomach and thru the circulatory system without local reactions to even chemicals in the stomach. For example, metal ion substitution permits even a zinc metalloprotein to take up the silver ion and release the zinc ion. The free, ionized zinc, which would be toxic if permitted to accumulate, binds to a metal regulatory element on the promoter region of the Metallothionein gene and "turns on" the synthesis of more Metallothionein.
- The Metallothionein protein is composed of a polypeptide chain of 61 amino acid residues of which there are 20 cysteine residues and many lysine's and arginines. There are no aromatic amino acids and very few bulky aliphatic ones. All the cysteines occur in the reduced forms and the metal ions are co-ordinated to them through mercaptide bonds. Ion channel formation /Transmembrane ion transport, a critical process in providing energy for cell functions, is carried out by pore-forming macromolecules capable of discriminating among very similar ions and responding to changes in membrane potential. It is widely regarded that ion channels are exclusively proteins.

- Extensive research has shown that silver exporting ATPase Hydrolases act on acid anhydrides, catalysing transmembrane movement of substances such our OSHM's. The ion pump mechanism utilizes energy from ATP to force ions thru a cell membrane, verses the passive diffusion, in which case the protein (in the cell membrane) that allows this transport is called an ion channel.
- See the Universal Protein Database for data on a silver substituted metalloprotein, a very small protein composed of only 294 atoms. (PDB # 1AQQ)
- After the OSHM is no longer bioactive ninety eight percent of the OSHM consumed in a day is excreted via the large intestine and the kidneys. Even if one liter (nearly 4 bottles of our OSHM product was taken in one day the body will excrete all but 2% of the silver within 24 hours. OSHM starts its elimination process by combining with plasma proteins, after which it is removed by the liver. More than 90% is eliminated in the bile. Most of this comes out in the feces; with very little being excreted in the urine. The 2% of silver that is not excreted through the bowl is deposited in the skin and mucous tissues. Tissue deposition of silver results from precipitation of insoluble salts, such as silver chloride and silver phosphate, into cell membranes mostly. These may be transformed to soluble silver sulphide albuminates and bind with amino or carboxyl groups in proteins and nucleic acids. They may also be oxidized to metallic silver by ascorbic acid, or catecholamines, and slowly excreted via your sweat glands. The OSHM is readily processed and excreted in these manners.
- Unlike our product regular metallic colloidal silver products, or other poorly produced products such as silver salts or crystals, may be retained for years since your body can not process large silver particles. The body either discharges these particles without any beneficial physiological benefit or absorbs the silver particles in the tissues if they are not removed by the lymphatic system. The fatal dose of retained silver for the average human is 10 grams. Due to its low PPM there is no way to receive a fatal does at one time. The body would literally die from over hydration before a fatal dose could be achieved at one time.

FYI: African NDA Application: <http://www.bionaid.com/nda.htm>