

How to Choose the Highest Quality Oligodynamic Silver Product

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The benefits of oligodynamic silver have been well documented since the beginning of the 20th century. Silver, in its many forms, has been used to speed wound healing, treat infections, purify water, and preserve beverages. However, only oligodynamic silver is biologically active, and historically producing it in high concentrations has been severely limited by the technology of the day. Nanotech oligodynamic silver, the modern method of delivering the powers of silver, is a powerful, natural antibiotic and preventative against most human infections.

Renewed interest in oligodynamic silver has resulted in a number of manufacturers producing a wide range of depleted oligodynamic silver products, which may be confusing for health-conscious individuals seeking to find the best source of product available. Before jumping on the marketing hype bandwagon, it is vital consumers are fully informed as to the quality of the product and the integrity of the company which manufactures it.

Question: What are the most desirable attributes one should look for in choosing a colloidal silver product?

Answer: When choosing colloidal silver it is essential to select a product that strives to have 100 percent active silver content and an absolute minimum of inactive silver. Especially to be desired are the smallest, positively charged silver molecules and the avoidance of large, neutrally charged particle sizes of silver. Only the former silver products are oligodynamic (*oligo* meaning few and *dynamic* power).^{1, 2} This means that only very small doses of the total elemental silver are required since it has great power due to its positive charge. Technically speaking, oligodynamic silver is also known as Ag⁺, Ag(I), silver (I), silver ions, or more specifically, silver “cations.”

The optimal size thus far obtained for a modern nanotech oligodynamic silver product is a molecular size of ≤ 1 nanometer (0.001 microns).^{3, 4} And these particles must have the correct positive charge.⁵

Also, the best liquid colloidal silver products are the ones with concentrations of silver equal to or less than 25 parts per million (ppm). This imbues unimpeachable safety within the product. In fact many elemental colloidal silver containing high quantities of silver may only be 0.32% to 16.7% rich in oligodynamic silver.^{6, 7} Their remaining silver content is useless.

So when other products boast of possessing elemental silver content over 30 ppm, 300 ppm or even 2000 ppm, it is important for everyone to realize that these products assume unacceptable risks over pure oligodynamic preparations.

Question: What is meant by correct charge?

Answer: Suspended (colloidal) silver particles must have a positive charge to be active and biologically meaningful.^{8, 9} This attribute of charged colloidal silver particles, and their bioavailability, is intimately tied to the product’s “dispersion of particles.” When each respective and suspended silver particle is positively charged, it repels all

other similarly charged and suspended silver particles around it, providing an ideal uniform dispersion of the active silver particles in water.

The greater the dispersion of the particles, the higher is the surface area exposure of the silver particles that enables them to make either (A) lethal contact with germs on the one hand, and on the other hand (B) initiate regenerative effects upon human white blood cells and other target tissues.^{10, 11, 12} When the particle charges are neutral, no such repelling of particles occurs between themselves and this can lead to agglomeration of the inactive particles. In many cases, the inferior process of producing the particles to begin with can only produce large agglomeration of particles from the start.

If the particles agglomerate, they have either oxidized or reverted to inactive (neutral) silver and have lost their entire biological value. Just think of a solid silver basketball. The surface of the basketball can make contact with the outside environment, but the vast amount of silver on the inside of the solid sphere cannot. This enormous inner content of silver is a complete waste and totally useless for conducting biologically meaningful work.

Collectively, the particle's fineness or smallness, combined with their charge and dispersion, promotes the overall bioavailability and bioactivity of the product.

Question: Should the gross amount of elemental silver contained in a product be an indication it will offer better results to the consumer?

Answer: No. As stated above, this is one of the great fallacies of modern marketing. It's not the overall concentration of gross or elemental silver that has value but the amount or percentage of ACTIVE silver cations present. Only the percentage of oligodynamic silver determines which product is most efficient and safe. For example silver salts produce exceedingly small quantities of oligodynamic silver cations, with the exception of caustic silver nitrate (62.7% oligodynamic)¹³ However, silver nitrate has few medical applications due to its caustic nature.

For the remaining silver salt preparations, their low oligodynamic content arises because silver salts dissolve into solutions rather than suspending into a liquid. The resulting and restricting dissociation constant (separating force) of the liquid is weak. Therefore, the silver cation of the salt is extremely, tightly imprisoned to its partner (anion). Since the cation and anion have opposite charges, they simply hold onto each other for dear life, as it were, and the liquid they are dissolved into exerts little aid to enable them to freely interact with other biological molecules.

For example, in order for the silver cation to become free to perform useful immune activities, it must totally divorce itself from its partner anion which would require an elusive energy source. Lacking such an energy source, silver salts simply cannot accomplish any robust or highly desirable therapeutic goal when compared to suspended and fully liberated oligodynamic silver cations.^{14, 15}

In summary, the all inclusive oligodynamics of any suspended metal particle derive strictly from:

- Size of suspended particles,^{16, 17, 18}
- Charge of the suspended particles,^{19, 20, 21, 22}
- Concentration of the suspended particles^{23, 24, 25} and
- Shape of the suspended nanometer (nm) or picometer (pm) particles.^{26, 27}

Question: What about color? Some companies say a golden or yellow color is preferable.

Answer: Colloid silver should have little or no color. Colloids only have color when the particles are too large, when oxidation has occurred, or when contaminants are present. Deep colors may be the result of added chemical reagents or other natural colors in solution that have nothing to do with the silver. These colors are due to factors unrelated to silver and may indicate an inferior product. Keep in mind that any additive or unintended contaminant in a colloidal silver formula will coat the silver particles or cause them to agglomerate and reduce their efficacy.

Question: Are there any other properties one should look for when purchasing colloidal silver?

Answer: Yes. Colloidal Silver should be neither acidic nor basic. A balanced pH, as close to a pH of seven as possible, is advantageous so the silver particles are not subject to chaos as the pH swings back and forth during ingestion.

Question: Is the above information easily obtainable from reading labels?

Answer: No, not really. Particle size and concentrations should be printed on the product's label, but more specific information can either be found on the internet or by phoning any manufacture's customer service department. Unfortunately, companies often make claims that we have found are not substantiated. For example, many companies cannot control their concentrations and their product's actual concentration of silver is at variance with the label claim. As for particle size, many companies make claims that they cannot substantiate when their product is submitted to laboratory testing.

Question: How does one know this?

Answer: By testing the samples of commercially available silver products with Atomic Absorption Analysis, and by looking at hundreds of transmission electron microscopic photographs on these same samples, the physical attributes of the products becomes quite clear. The reader is directed to the IMREF web site section on "Physical Characteristics of Commercially Available Products" for further consideration.

Question: There are a number of companies who are producing colloidal silver. If one selects a product with the finest, positively charged silver particles in a clear solution is that enough to insure the best product choice?

Answer: Not entirely. It is of extreme importance that the consumer has confidence in the company that produces the product. Complete disclosure of the colloidal silver product's ingredients should be imprinted on the bottle or box. This insures the brand label is safe and reliable. Whatever brand of colloidal silver is purchased, it must conform to its label claims. This is the best gauge of a manufacturer's integrity.

References:

- ¹ Webster's Third International Dictionary, unabridged, (c) 1981; p. 1572.
- ² Goetz, A, Tracy, RL, Harris, FS, "Oligodynamic Effect of Silver," Chapter 16. In: *Silver in Industry*, edited by L. Addicks, Reinhold Publishing Corp., NY, 1940; p. 402.
- ³ Argentyn 23, Lot #BR11, University of Miami, May 5th, 2004; 100,000X, jpg.
Technique specifics: To view the optimal *contrast*, the T.E.M. image was taken under 60,000V, as opposed to 100,000V, which is superior for optimal *resolution* enhancement.
- ⁴ Baker C, et al., "Synthesis and antibacterial properties of silver nanoparticles," *J Nanosci Nanotechnol*. 2005 Feb;5(2):244-9.
- ⁵ Zhu X, Ag⁺ Concentration Determination of Argentyn 23. Miami: Department of Marine Biology, University of Miami, 2003.
- ⁶ Foye, WO, "Antimicrobial Activities of Mineral Elements," In: *Microorganisms and Minerals*, Chapter 10, Volume 3, Eugene D. Weinberg, editor, Marcel Dekker, Inc., NY, 1977; p. 388.
- ⁷ Pilcher, JD, Sollmann, T, "Organic, Protein and Colloidal Silver Compounds; Their Antiseptic Efficiency and Silver-Ion Content as a Basis for Their Classification" *The Journal of Laboratory and Clinical Medicine*, 1922; p. 307.
- ⁸ Russell, AD, Path, FR, Hugo, WB, "Antimicrobial Activity and Action of Silver," *Prog Med Chem*, 1994; 31:353.
- ⁹ Wood, HO, et al., *The Dispensatory of The United States of America*, 22nd Edition, J.B. Lippincott Co., Philadelphia, 1937; p. 182-3.
- ¹⁰ Marino, AA, et al., "The Effects of Selected Metals on Marrow Cells in Culture," *Chem. Biol. Interactions*, 1974; 9:217.
- ¹¹ Becker, RO, "The Effect of Electrically Generated Silver Ions on Human Cells," First International Conference on Gold and Silver in Medicine, Bethesda, MD, May 13-14, 1987.
- ¹² Marino, AA, EA Deitch, V Malakanok, JA Albright, RD Specian, "Electrical Augmentation of the Antimicrobial Activity of Silver-Nylon Fabrics," *J. Biol. Phys.*, 1984; 12:93.
- ¹³ Pilcher, JD, Sollmann, T, "Organic, Protein and Colloidal Silver Compounds; Their Antiseptic Efficiency and Silver-Ion Content as a Basis for Their Classification" *The Journal of Laboratory and Clinical Medicine*, 1922; p. 307.
- ¹⁴ Pilcher, JD, Sollmann, T, "Organic, Protein and Colloidal Silver Compounds; Their Antiseptic Efficiency and Silver-Ion Content as a Basis for Their Classification" *The Journal of Laboratory and Clinical Medicine*, 1922; p. 301-10.
- ¹⁵ Goetz, A, Tracy, RL, Harris, FS, "The Oligodynamic Effect of Silver," In: *Silver In Industry*, Chapter 16, edited by Lawrence Addicks, Reinhold Publishing Corp., NY, 1940; p. 401-2.
- ¹⁶ Bechhold, H. Op. cit., p. 13, 366 & 368.
- ¹⁷ Hartman RJ. Colloid Chemistry, Houghton Mifflin Co., The Riverside Press, Cambridge, MA, 1939; p. 13.
- ¹⁸ Baker C, et al. Synthesis and antibacterial properties of silver nanoparticles. *J Nanosci Nanotechnol*, 2005 Feb;5(2):244-9.
- ¹⁹ Feng QL, et al. A mechanistic study of the antibacterial effect of silver ions on Escherichia coli and Staphylococcus aureus," *J Biomed Mater Res*, 2000 March;52:662.
- ²⁰ Rochart, C, Uzdins, K, "Katadyn (Silver Preparation): Clinical Application," *Schweiz Med Wochenschr*, 1947; 77:1100-4. In: Simonetti, N, et al., "Electrochemical Ag⁺ for Preservative Use," *Applied and Environmental Microbiology*, Dec 1992; 58(12):3834.
- ²¹ Samuni, A, et al., "On the Cytotoxicity of Vitamin C and Metal Ions," *Eur J Biochem*, 1983; 99:562.

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- ²² Nomiya K, et al. Synthesis and structural characterization of silver(I), aluminium(III) and cobalt(II) complexes with 4-isopropyltropolone (hinokitiol) showing noteworthy biological activities. Action of silver(I)-oxygen bonding complexes on the antimicrobial activities. *Journal of Inorganic Biochemistry*, 2004 Jan;98(1):46-60.
- ²³ Zhao G, Stevens SE. Multiple parameters for the comprehensive evaluation of the susceptibility of *Escherichia coli* to the silver ion. *Bio Metals*, 1998;11:28.
- ²⁴ Cliver DO, Sarles WB, Foell WK, Goepfert JM. Biocidal effects of silver: Contract NAS 9-9300 Final Technical Report. University of Wisconsin, Accession Number – N70 23888, NASA CR Number – CR-108338, 1970 Feb; p. 4-4 through 4-6.
- ²⁵ Berger, TJ, et al., "Electrically Generated Silver Ions: Quantitative Effects on Bacterial and Mammalian Cells," *Anti Microb Agents*, 1976;9(2):357-8.
- ²⁶ Morones JR, et al., The bactericidal effect of silver nanoparticles. *Nanotechnology*, 2005; 16: 2346-2353 doi:10.1088/0957-4484/16/10/059.
- ²⁷ Elechiguerra JL, et al., Interaction of silver nanoparticles with HIV-1. *J Nanobiotechnology*. 2005; 3: 6.