

TST - The Science

Scientific Data

Tetrasilver tetroxide (Ag₄O₄) is a uniquely configured multivalent silver oxide. Its structure has been elucidated especially by neutron diffraction to comprise a molecular ionic crystal that contains four silver ions and four oxygen atoms within the molecule. It is comprised of two Ag(I) ions and two Ag(III) ions that are physically separated by and tightly bound with four O²⁻ (oxygen) ions in an electrically neutral, highly stable, semi-conducting molecular crystal. Each tetrasilver tetroxide molecule may be conceived of as containing two nano-scale batteries, each consisting of an electrically imbalanced Ag(I) / Ag(III) pair. When these "batteries" discharge, each pair produces two divalent Ag(II) ions in a classic oxidation-reduction (REDOX) reaction.

In other words, the monovalent silver ions oxidize to divalent silver ions simultaneously with the reduction of the trivalent silver ions to divalent ions through the exchange of one electron per ion pair, viz:

Per ion pair: $\text{Ag(I)} - \text{e} = \text{Ag(II)}$, $\text{Ag(III)} + \text{e} = \text{Ag(II)}$

or $\text{Ag(I)} + \text{Ag(III)} = 2\text{Ag(II)}$

Per molecule: $2\text{Ag(I)} + 2\text{Ag(III)} = 4\text{Ag(II)}$

The ability of tetrasilver tetroxide to exchange electrons in this manner, has led to the descriptive term Electron-Jumping Compound®.

Tetrasilver tetroxide's unique characteristic is its intrinsic ability to further stabilize its ionic imbalance through the REDOX reaction (described above). This discovery resulted in a score of US patents and patent applications of inventions by the company for a variety of anti-microbial applications.

This anti-microbial behavior has been shown to be effective against a broad spectrum of infectious agents. TST, in various formulations, has also gone through a series of dermal, oral, ocular and genotoxicity studies. Data strongly suggests that TST is non-toxic when used in therapeutically appropriate doses. Additionally, what is quite promising is that EJC's mechanism of action may circumvent the resistance and mutation strategies of pathogens. If true, this could have profound implications for the rampant increase in infectious skin conditions worldwide.

The inhibitory effect of one Electron-Jumping Compound® (Tetrasilver Tetroxide; abbreviated TST®) has been established by some of the world's leading contract research organizations, select universities and hospital research labs.

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Electron Jumping Compounds (EJC's)

Aidance Skincare's products are all based on the use of Electron-Jumping Compounds®. EJC's are a family of seven electron-active metallic oxides that are uniquely structured as semi-conducting crystal devices.

One of the key characteristics of EJC's is their natural selective attraction to pathogenic organisms — gram-negative and gram-positive bacteria (including antibiotic-resistant strains), viruses and fungi. Research has shown that each of these pathogens, in the process of their rapid proliferation, produce targeted chemicals (principally nitrogen groups) on their membrane surface.

A multi-stage chemical (redox) reaction is triggered upon EJC's contact with the pathogen's targeted nitrogen groups:

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Covalent binding with the micro-organism

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Release of electrical energy (nano electrocution)

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Release of highly active singlet oxygen

Below is an artist's rendering, showing EJC's proposed mechanism of action on viruses.

Attraction of EJC molecules (swarm of blue specks) to exposed nitrogen on the viral envelope terminals
Close up of EJC molecules' attraction and release of electrical charge at the viral envelope
Full contact with the virus, then subsequent covalent binding, electrocution and release of highly active singlet oxygen

Rapid death of the virus

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Test Data

TetraSILVER has been studied for over 10 years, showing that it is, both, very effective and very safe in skin care applications.

In-Vitro Testing:

"In-vitro" means an artificial environment created outside a living organism (e.g., a test tube or culture plate) used in experimental research to study a disease or process. Before tetraSILVER became our products' unique ingredient it was tested by 14 independent research labs against gram-negative bacteria, gram-positive bacteria, fungi, yeast, and viruses. The labs included Quintiles, Parexel, MDS/Pharma, and other world renowned research organizations. Test after test documented the powerful antimicrobial properties of tetraSILVER.

Toxicity Testing:

In 1966, the US Environmental Protection Agency (EPA) approved tetraSILVER as an effective disinfectant in swimming pools, after extensive tests showed this Silver Oxide was capable of quickly killing a wide spectrum of germs. In the same series of studies, the EPA also determined that TetraSILVER was safe, after passing a series of oral (swallowing), dermal (skin), and ocular (eye) toxicity tests. These tests were very important because some people are in pools every day.

Clinical Testing:

Initial clinical investigations with 328 people (conducted by research dermatologists), in addition to reports from doctors throughout the world, strongly suggest that TetraSILVER, as a key ingredient in skin care products, provides outstanding benefits and supports the body's ability to quickly resolve many common skin problems.

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Patents

Several patents and patents pending protect the company's intellectual property relative to skincare and topical applications.

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Compositions using tetrasilver tetroxide and methods for management of skin conditions using same; Patent # 6,669,966; Issued December 30, 2003

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Multivalent electron active compositions and methods of making and using same; Patent # 6,645,531; Issued November 11, 2003

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High performance silver (I,III) oxide antimicrobial textile articles; Patent # 6,436,420; Issued August 20, 2002

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High performance cobalt (II,III) oxide antimicrobial textile articles; Patent # 6,228,491; Issued May 8, 2001

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Tetrasilver tetroxide treatment for skin conditions; Patent # 6,258,385; Issued July 10, 2001

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Compositions and methods for facilitating skin growth and managing skin conditions; PCT Int'l Patent Application # PCT/US00/29115; Filed October 20, 2000

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Molecular crystal redox device for pharmaceuticals; Patent # 5,571,520; Issued November 5, 1996

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Molecular crystal device for pharmaceuticals; Patent # 5,336,499; Issued August 9, 1994

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