MMS for Household Uses

What is MMS?

Sodium Chlorite ● Chlorine Dioxide

Part 1 - What is this stuff ?

https://www.keavyscorner.com/MMS-what-is-it-a/268.html

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MMS (22.4% Sodium Chlorite Solution)

Jim Humble's Miracle Mineral Solution for Household Uses

(PREFACE: While the author is not a chemist, or a health care professional, he has worked extensively for years with the manufacture of sodium chlorite solutions, and chlorine dioxide solutions for consumer use as well as industrial use. He is familiar with the handling and characteristics of the chemicals mentioned in this article. The author has also talked with 1000's of people who have used MMS for a variety of applications, some approved, some not. While this article is meant to be informative about the nature and characteristics of the solution known as MMS, this article will not address any unapproved or medicinal use of this product.)

MMS: Just what the heck is this stuff?

MMS was originally an acronym for Miracle Mineral Supplement. This phrase was coined by Jim Humble after he developed the formula. Later on the word "Solution" was generally substituted for the word "Supplement".

Other names have included, "Faith Drops", "Advanced Oxygen Therapy", Water Purification Drops (WPD), and more recently, Master Mineral Solution. MMS is in all actuality a 22.4% solution of sodium chlorite ($NaClO_2$). The remainder of the solution is water, and inert salts. When added to an "Activator" of weak acid, MMS releases a gas called Chlorine Dioxide.

Regardless of what it is called, MMS has caused a sensation since 2006 when Jim released the first book, *"Breakthrough - The Miracle Mineral Supplement of the 21st Century"*, and it's popularity and the movement behind it has continued to grow.

This is not the case for most "fad" health products. Very few things in alternative health have the lasting power, and faithful followers and believers that MMS has. While the pro-MMS movement has grown, so has the anti-MMS crowd. Websites and Forums dedicated to both sides of the coin can easily be found with a simple search.

In this article I will try to answer some of the most common questions and misconceptions about MMS, Sodium Chlorite, and Chlorine Dioxide, take a look at Jim Humble and the Genesis 2 Church, and tackle some of the most often debated statements made about MMS.

In Part 1, of this continuing article, we will briefly discuss Sodium Chlorite, (What MMS is as bottled), and go into some detail on Chlorine Dioxide, (the gas produced through activation).

PART 1

MMS: What it Is and How it Works.

In the first part of this series, we will look at the actual material that MMS is made from, Sodium Chlorite as well the Chlorine Dioxide it produces.

The questions I am most often asked are :

What exactly is MMS? What's it made out of? Is it Natural?

MMS is a solution made from 22.4% Sodium Chlorite and Distilled water.

There will be some inert salts that were used as buffers in the raw material, which is usually a technical grade of anhydrous sodium chlorite.

This may be in powder or flake form, depending on the manufacturer.

The amount and type of these inert ingredients can vary depending on the raw material used, but will generally not exceed 5.6% in the MMS solution.

Typical inert ingredients found in the raw material are Sodium Sulfate, Sodium Carbonate, and Sodium Chloride (salt).

There may be traces of Sodium Hydroxide, and Sodium Chlorate left over from the manufacturing process of the raw material.

Industrial Grades for non EPA approved uses may contain traces of lead, mercury, and arsenic.

The term 28% Sodium Chlorite used by many people is a misnomer. It includes the inert salts, as well as the actual sodium chlorite when one uses an 80% raw material. This can vary if one is using a different raw material. For instance, if one use a 90% Sodium Chlorite as a substrate, the 28% figure would produce a different result.

Sodium Chlorite is not a natural product although some websites would like you to believe it is. **It is a manufactured chemical not found in nature**. Sodium Chlorite itself has no real viable uses. **It is manufactured solely as a precursor to the generation of Chlorine Dioxide**. (CLO_2). It is most often manufactured by what is known as the Hooker R2 Process.

Toxic Sodium Chlorate is mixed with Sodium Chloride. Sulfuric Acid is added to this, and chlorine dioxide, as well as chlorine gas is formed. The gases are separated by absorbing the soluble chlorine dioxide in chilled water towers. Sodium Hydroxide is used as well as. Hydrogen peroxide to form the Sodium Chlorite, and remove Sodium Chlorate .

There has been an article circulating for years on eHow and Yahoo answers, about making sodium chlorite from a brine solution through electrolysis, that can be done at home. This actually produces toxic sodium chlorate and should not be attempted. **There is no simple method to produce Sodium Chlorite at home.**

Anhydrous Sodium Chlorite and Sodium Chlorite Solution can be safely shipped as opposed to Chlorine Dioxide Gas which can not be shipped safely, or economically. Once on site, the Sodium Chlorite is put into solution. This solution has a high pH, usually 12 +. An acid is added to lower the pH and Chlorine Dioxide is produced.

Chlorine Dioxide

Chlorine Dioxide is the 'Active Ingredient" of MMS so to speak. It exists as a greenish gas at normal temperatures. This is what is created when MMS is activated with an weak acid solution. The concentrated gas being formed in the mixed solution gives it an amber aspect. Chlorine Dioxide is a small, volatile molecule, that reacts with other substances by means of oxidation.

Depending on the use, and how it is formed, it is an FDA and EPA approved pesticide that can be used in food service, municipal water, mold treatment, odor treatment, medical use, mouthwashes, toothpastes, eye care, and in personal water treatment products, among other applications. It is considered to be a more "Earth-Friendly" alternative to many chlorine applications.

Isn't Chlorine Dioxide the same as Bleach?

Bleach is a relative term. Many chemicals including oxidizers such as Hydrogen Peroxide (H_2O_2), can be considered a bleach. Bleaching means they remove color, and yes, Chlorine Dioxide will remove color, like most oxidizers. One industrial use for Chlorine Dioxide is as a bleach for wood pulp, (used in conjunction with sodium hypochlorite), and as a bleach for flour in some countries including the US. The reason it is used in paper mills is because of the fact that chlorine dioxide gas prohibits the growth of biofilm, rather than for it's bleaching properties. When people say bleach they usually mean Sodium Hypochlorite (common household bleach).

The real question is: Is chlorine dioxide (ClO2) the same as chlorine (Cl) or hypochlorite (ClO). The short answer is a resounding **NO!**

However, before we look at why they are so different**, let's look at why people tend to equate them.** It does smell a lot like chlorine. It can also irritate the eyes and respiratory system if the concentration is too strong. It disinfects, and kills micro-organisms.

Then of course the name.... Chlorine Dioxide..... and yes, Chlorine dioxide does have a Chlorine atom. But.... so does table salt; in fact the only elemental difference between table salt, sodium chlorite (MMS Solution), and common bleach is the number of oxygen atoms attached to the molecule.

1 Sodium Atom + 1 Chlorine Atom = **NaCl** Sodium Chloride. (Common Salt Molecule)

1 Sodium Atom + (1 Chlorine Atom +1 Oxygen Atom) = **NaClO** Sodium Hypochlorite Molecule. (Common Bleach)

1 Sodium Atom + (1 Chlorine Atom + 2 Oxygen Atoms) = **$NaClO_2$** Sodium Chlorite Molecule. (MMS, used to generate clean Chlorine Dioxide. (ClO_2)

1 Sodium Atom + (1 Chlorine Atom + 3 Oxygen Atoms) = **$NaClO_3$** Sodium Chlorate Molecule. (Used to make other chlorine compounds. Used as a pesticide and defoiliant, Toxic.)

1 Sodium Atom + (1 Chlorine Atom + 4 Oxygen Atoms) = **$NaClO_4$** Sodium Perchlorate Molecule. (Non-reactive electrolyte often used in molecular science for DNA extraction and hybridization.)

This is to demonstrate the difference a single atom can make in a molecule. Pure sodium would ignite in your mouth, and pure chlorine has been used as a chemical weapon, yet table salt, a necessary mineral, is just a combination of the two. In fact these 2 elements, **Sodium and Chlorine make up about 0.2% of your total body chemistry each.**

The Differences between Chlorine Dioxide and Chlorine

This is the real focus of the issue, and the answer is really pretty simple. While both kill pathogens, well.... Chlorine Dioxide does it differently, and more efficiently, without creating toxic byproducts. Chlorine Dioxide kills by oxidation, whereas Chlorine kills by substitution, (in this case called chlorination).

Chlorine Dioxide has a lower **oxidation strength** than chlorine, but more than twice the **oxidative capacity**. Reduction/Oxidation Strength or "**Redox**" is a measure of how strongly an oxidizer reacts with an organic material. The higher the redox potential, the more substances the oxidizer will react with. Chlorine Dioxide has a lower redox potential than ozone, chlorine, or hypochlorus acid. **Because of this lower redox potential, Chlorine Dioxide is more selective in what it reacts to.** Typically Chlorine Dioxide will only react with compounds that have active carbon bonds, sulfides, cyanides, and compounds with reduced iron or manganese. **Chlorine has a higher redox, and will react with a wider range of compounds, including ammonia.**

Because of this difference Chlorine Dioxide does not create toxic by-products like chlorine does. This is why Chlorine is limited as a biocide in it's overall effectiveness as opposed to Chlorine Dioxide. The higher oxidation capacity means that Chlorine Dioxide will remove 5 electrons from the target, whereas chlorine can only remove 2.

Chlorine will bind to a pathogen, and other chemicals and compounds that may be present. Chlorine Dioxide being more selective, will not bind with other compounds.

Because of this capacity, **Chlorine Dioxide is more efficient than Chlorine, Ozone, or Hypochlorus Acid when used as a disinfectant.** After the reaction is complete, **Chlorine Dioxide reverts to chloride (salt). Chlorine forms Trihalomethanes from reaction to ammonia, plus other byproducts from other chemicals and compounds as may be present.**

How Chlorine Dioxide Works on Pathogens

Chlorine Dioxide kills pathogens by stopping protein formation. **Viruses and Bacteria are killed by different methods.**

Bacteria is killed through the oxidation process mentioned above. Chlorine Dioxide steals five electrons from the amino acid of the targeted pathogen. The amino acid becomes unable to produce the proteins necessary to maintain the cell wall. The cell wall collapses and the pathogen dies. Viruses are killed by the reaction of Chlorine Dioxide to peptone. Peptone is vital to the protein formation of a virus. It becomes unable to function, thus "starving" the virus.

Pathogens can't build a resistance to Chlorine Dioxide. Even so called "Superbugs" that are resistant to antibiotics have no defense. Chlorine dioxide attacks these pathogens at the molecular level, not through poisoning.

The History of Chlorine Dioxide.

Chlorine Dioxide is discovered by Sir Humphrey Davy in 1844. The British chemist combined potassium chlorite with sulfuric acid. It would soon be discovered that this green gas would be a more effective disinfectant than chlorine.

By the 1930s Chlorine Dioxide is being used more frequently for disinfecting areas. Because of it's gaseous form, it filled spaces evenly. The volatile gas was impossible to ship safely, so Sodium Chlorite began to be manufactured as a relatively safe precursor chemical, and the industries using chlorine dioxide would then generate the gas on-site as needed. Because of Chlorine Dioxide's solubility in water, it starts being used as a water treatment.

In 1944, Chlorine Dioxide is used by the City of Niagara, New York, to control odor and remove phenols from the river water used as the municipal water supply to good effect. The city soon changes to Chlorine Dioxide exclusively. The water is cleaner, tastes better, and has no odor compared to the use of chlorine.

In 1956 Brussels Belgium makes the switch from Chlorine to Chlorine Dioxide for it's municipal water system.

It was discovered that Chlorine Dioxide would destroy algae biofilm, a feat which Chlorine could not accomplish. Through the 1960s more cities and swimming pools start to change to Chlorine Dioxide.

In 1967 The United States Environmental Protection Agency (E.P.A) registers an aqueous form of Chlorine Dioxide to be used as a sanitizer and disinfectant. Chlorine Dioxide starts being used commercially on fruit and produced as a sanitizer.

In the 70s and 80s the EPA begins recommending Chlorine Dioxide over Chlorine for water treatment and other applications. This is due to the fact that because of their different chemical properties, Chlorine Dioxide is more efficient, and does not produce toxic trihalomethanes like chlorine.

In 1988 the EPA registers Chlorine Dioxide as a sterilizer approved for hospitals, laboratories, and health care facilities.

In 2001 FEMA and other government agencies use Chlorine Dioxide to decontaminate buildings contaminated with Anthrax. Chlorine Dioxide is completely effective against the tiny Anthrax Spores. The buildings, walls and furnishings suffer no damage from the treatment.

In 2005 FEMA again uses Chlorine Dioxide. This time to eradicate mold from damage caused by Hurricane Katrina. A restaurant in New Orleans was able to re-open after being treated for just 12 hours without major repair.

In 2006, a man named Jim Humble releases a book called *"Breakthrough - The Miracle Mineral Supplement of the 21st Century"* in which he details that in desperation, he used a sodium chlorite solution in a chlorine dioxide water treatment product in an attempt to alleviate a man's severe malaria symptoms. The man was in fact cured. Jim went on recount many other illnesses he has discovered that chlorine dioxide could be used for. He develops MMS which is a system to generate small amounts of chlorine dioxide at home.

In 2010 the United States Food and Drug Administration issues a warning on using MMS according to the Jim Humble protocols. They label it as industrial bleach. In the mean time they will have approved the use of Chlorine Dioxide for use in mouthwashes, toothpastes, and as a food service disinfectant among other uses, citing it as being a better alternative than chlorine.

The products, uses, and applications for Chlorine Dioxide continue to grow. More and more mainstream health and home related products are using chlorine dioxide.

Chlorine Dioxide Biocidal Spectrum

As mentioned above, Chlorine Dioxide in different products has been registered since 1988 as a sterilizer. The EPA definition of a sterilizer is the ability ***"to destroy or eliminate all forms of microbial life including fungi, viruses, and all forms of bacteria and their spores."***

More specific tests have been done that prove Chlorine Dioxide's ability to destroy the following:

BACTERIA
Blakeslea trispora
Bordetella bronchiseptica
Brucella suis
Burkholderia mallei
Burkholderia pseudomallei
Campylobacter jejuni
Clostridium botulinum
Corynebacterium bovis
Coxiella burneti (Q fever)
E. coli ATCC 11229
E. coli ATCC 51739
E. coli K12
E. coli O157:H7 13B88
E. coli O157:H7 204P
E. coli O157:H7 ATCC 43895
E. coli O157:H7 EDL933
E. coli O157:H7 G5303
E. coli O157:H7 C7927
Erwinia carotovora
Franscicella tularensis
Fusarium sambucinum
Fusarium solani var. coeruleum
Helicobacter pylori
Helminthosporium solani
Klebsiella pneumonia
Lactobacillus acidophilus NRRL B1910
Lactobacillus brevis
Lactobacillus buchneri
Lactobacillus plantarum
Legionella
Legionella pneumophila
Leuconostoc citreum TPB85
Leuconostoc mesenteroides
Listeria innocua ATCC 33090
Listeria monocytogenes F4248
Listeria monocytogenes F5069
Listeria monocytogenes LCDC
Listeria monocytogenes LCDC
Listeria monocytogenes Scott A
Methicillin resistant Staphylococcus aureus (MRSA)
Multiple Drug Resistant Salmonella typhimurium (MDRS)
Mycobacterium bovis
Mycobacterium fortuitum
Pediococcus acidilactici PH3
Pseudomonas aeruginosa
Pseudomonas aeruginosa
Salmonella
Salmonella spp.
Salmonella Agona
Salmonella Anatum Group E
Salmonella Choleraesins ATCC 13076
Salmonella choleraesuis
Salmonella Enterica (PT30) BAA
Salmonella Enterica S. Enteritidis
Salmonella Enterica S. Javiana
Salmonella Enterica S. Montevideo
Salmonella Enteritidis E190
Salmonella Javiana
Salmonella newport
Salmonella Typhimurium C133117
Salmonella Anatum Group E
Shigella
Staphylococcus aureus
Staphylococcus aureus ATCC 25923
Staphylococcus faecalis
ATCC 344
Tuberculosis
Vancomycin
resistant Enterococcus faecalis (VRE)
Vibrio strain Da
Vibrio strain Sr
Yersinia enterocolitica
Yersinia pestis
Yersinia ruckerii ATCC 29473

VIRUSES
Adenovirus Type 40
Calicivirus
Canine Parvovirus
Coronavirus
Feline Calici Virus
Foot and Mouth disease
Hantavirus
Hepatitis A Virus
Hepatitis B Virus
Hepatitis C Virus
Herpes
Human coronavirus
Human Immunodeficiency Virus
Human Rotavirus type 2 (HRV)
Influenza A
Minute Virus of Mouse (Parovirus) (MVMi)
Minute Virus of Mouse (Parovirus)(MVMp)
Mouse Hepatitis Virus (MHVA59)
Mouse Hepatitis Virus (MHVJHM)
Mouse Parvovirus type 1 (MPV1)
Murine Parainfluenza Virus Type 1
Newcastle Disease Virus
Norwalk Virus
Poliovirus
Rotavirus
Severe Acute Respiratory Syndrome (SARS) Coronavirus
Sialodscryoadenitis Virus (Coronavirus)(SDAV)
Simian rotavirus SA
Theiler's Mouse Encephalomyelitis Virus(TMEV)
Vaccinia Virus

BACTERIAL SPORES
Alicyclobacillus acidoterrestris
Bacillus coagulans
Bacillus anthracis
Bacillus anthracis Ames
Bacillus atrophaeus
Bacillus atrophaeus ATCC 49337
Bacillus megaterium
Bacillus polymyxa
Bacillus pumilus ATCC 27142
Bacillus pumilus ATCC 27147
Bacillus subtillis ATCC 9372
Bacillus subtillis ATCC 19659
Bacillus subtillis 5230
Bacillus thuringiensis
Clostridium. sporogenes ATCC 19404
Geobacillus stearothermophilus ATCC 12980
Geobacillus stearothermophilus ATCC 7953
Geobacillus stearothermophilus VHP

PROTEZOA
Chironomid larvae
Cryptosporidium
Cryptosporidium parvum Oocysts
Cyclospora cayetanensis oocysts
Giardia
Encephalitozoon intestinalis

MICROSPORIDA
Encephalitozoon intestinalis

FUNGUS/MOLD/YEAST
Alternaria alternata
Aspergillus aeneus

Aspergillus aurolatus
Aspergillus brunneo uniseriatus
Aspergillus caespitosus
Aspergillus cervinus
Aspergillus clavatonanicus
Aspergillus clavatus
Aspergillus egyptiacus
Aspergillus elongatus
Aspergillus fischeri
Aspergillus fumigatus
Aspergillus giganteus
Aspergillus longivesica
Aspergillus niger
Aspergillus ochraceus
Aspergillus parvathecius
Aspergillus sydowii
Aspergillus unguis
Aspergillus ustus
Aspergillus versicolor
Botrytis species
Candida spp.
Candida albicans
Candida dubliniensis
Candida maltosa
Candida parapsilosis
Candida sake
Candida sojae
Candida spp.
Candida tropicalis
Candida viswanathil
Chaetomium globosum
Cladosporium cladosporioides
Debaryomyces etchellsii
Eurotium spp.
Fusarium solani
Lodderomyces elongisporus
Mucor circinelloides
Mucor flavus
Mucor indicus
Mucor mucedo
Mucor rademosus
Mucor ramosissimus
Mucor saturnus
Penicillium chrysogenum
Penicillium digitatum
Penicillium herquei
Penicillium spp.
Phormidium boneri
Pichia pastoris
Poitrasia circinans
Rhizopus oryzae
Roridin A
Saccharomyces cerevisiae
Stachybotrys chartarum mentag
Verrucarin A

BETA LACTAM ANTIBIOTICS

Amoxicillin
Amplicillin
Cefadroxil
Cefazolin
Cephalexin
Imipenem
Penicillin G
Penicillin V

CHEMICAL DECONTAMINATION

Mustard Gas
Ricin Toxin
dihydronicotinamide adenine dinucleotide
microcystin LR (MCLR)
cylindrospermopsin (CYN)

Keep in mind this is not the full spectrum, but specific tests done against many of the most common pathogens. Included in this list are MRSA, HIV, E. Coli, Staph, Anthrax, Salmonella, Parvo, Aspergillus, Candida and many other pathogens that most people will have contact with throughout their lives. Chlorine Dioxide, when used as a water and surface treatment, vegetable rinse, and environmental cleaner, can help keep your home a cleaner, safer place than using chlorine based products.