



PRODUCT COMPARISON

Disinfectant Description Advantages Limitation

Chlorine Used in a gaseous state, requires strictest safety measures

Efficient oxidant and disinfectant

Efficiently eliminates tastes and odors

Featured with aftereffect

Capable of controlling the growth of algae, biological slimes and microorganisms

Decomposes organic contaminants (phenols...)

Iron and magnesium oxidant. Decomposes hydrogen sulfide, cyanides, ammonium and other nitrogen compounds

Strict requirements for transportation and storage

Potential danger for health in case of a leak. Formation of disinfection byproducts, such as chloroform. The MAC in water will be increased in the near future from 60 mkg/l up to 60 mg/l because there was no proof of direct action of the chloroform on DNA.

CHLORINE - CONTAINING SUBSTANCES

Hypochlorite Used in liquid and granulated forms (trade concentration - 10-20%), can be obtained on site, electrochemically

Effective against most of pathogen microorganisms

Relatively safe during storage and use

When on-site generated, does not require transportation and storage of chemicals

In effective against cysts (Giardia, Cryptosporidium)

Loses its activity during long-term storage

Potential danger of gaseous chlorine emission during storage

Forms trihalomethane. When on-site generated, requires either immediate use or, in case of storage, special measures to purify the initial water from heavy metals ions. When on-site generated, NaClO solution with the active chlorine concentration less than 450 mg/l does not

form chlorates during storage

Chlorine dioxide. The most effective disinfectant and strongest oxidation agent among all chlorine-containing ones

Operates in low doses

Does not form chloramines

Does not facilitate trihalomethane formation

Destroys phenols - source of unpleasant taste and odor

Effective oxidant and disinfectant for all types of microorganisms, including cysts, (Giardia, Cryptosporidium) and viruses

Does not form bromides from bromates

Facilitates removal of iron and magnesium from water by means of their quick oxidation and precipitation of oxides

On-site generation only

Requires transportation and storage of chemicals

In reaction with organic impurities forms nonorganic byproducts

Forms chlorates and chlorite ions

Chloramine Formed during the reaction of ammonium with active chlorine. It is used as a disinfectant of a prolonged activity

Features stable and long-time aftereffect

Facilitates removal of foreign taste and odor

Reduces the level of trihalomethane and chlorine-organic acid generation

Prevents formation of biological slimes in distribution systems

Weak disinfectant and oxidation agent compared to chlorine

Not effective against viruses and cysts (Giardia, Cryptosporidium)

Considerable dosages and prolonged contact time are required for disinfection

Dangerous for patients using dialyzers, because it is capable of penetrating the dialyzer membrane and effect erythrocytes

Forms nitrogen-containing byproducts

ALTERNATIVE SUBSTANCES

Ozone Has been used for several decades in some of European countries for the purpose of disinfection, elimination of color, for the taste and odor control

Strong disinfectant and oxidation agent

Very effective against Giardia, Cryptosporidium and any other pathogenic microflora

Facilitates removal of turbidity from water

Removes foreign tastes and odors

Does not form chlorine containing trihalomethanes

Forms byproducts, including: aldehydes, ketones, organic acids, bromine-containing trihalomethanes, (bromoform inclusive), bromates (in presence of bromides): peroxides, bromoacetic acid

Necessitates the use of biologically active filters to remove byproducts

Does not ensure residual disinfection effect

Requires significant initial expenses for the equipment

Considerable expenses for operators` training and installation support

When reacting with organic compounds, ozone disintegrates them into smaller components, which could become a feeding media for microorganisms` growth in water distribution systems

Ultraviolet Exposure of water to UV rays capable of killing various types of microorganisms

Does not require storage and transportation of chemicals

Does not form byproducts

No residual effect

Not efficient against cysts (Giardia, Cryptosporidium)

Requires considerable expenses for the equipment and technical maintenance

Requires considerable operational (power) expenses

Disinfection activity depends on the water turbidity, its hardness (sediments on the bulb surface), precipitation of organic impurities on the bulb surface, and deviations in the power supply, which effect the wavelength variation

ELECTROCHEMICAL ACTIVATION

Anolite Electrochemical activation of brine solution in a membrane electrolysis

Strong disinfectant and oxidation agent

Very effective against all kinds of bacteria and viruses

Highly effective as sporicidal agent

Effectively eliminates bad tastes and odors

Removes biofilms

Significantly less formation of chlorine compounds, halogens and TMT

No toxic by-products: chlorites (ClO_2) and chlorates (ClO_3)

No acute or chronic toxicity when diluted in water

Low cost

No transport or storage problem

Easy and safe storage and handling

Ventilation might be required in the installation room to remove fumes

THE BENEFITS OF ENVIROCLEANSE WATER DISINFECTING

- Due to very low concentration of active chlorine, Anolite diluted in the water does not result in any toxicity effects neither forms any toxic by-products.
- Anolite penetrates tiny pores of the water pipes or any other material.
- Anolite eliminates biofilm and algae from the distribution system.
- Water pipes and equipment don't have to be rinsed with water after disinfecting.
- Anolite doesn't harm the original, natural properties of the water.
- Anolite eliminates chlorine taste and odor, improves taste and odor from algae.
- Anolyte can be stored and kept for further use when the necessity arises.
- Easy dosing.
- High level of safety: no hazardous chemicals produced or used.

PRODUCTS COMPARISON

	Gas Chlorine	Delivered Hypo	Hypo Calcium	Chloramination	Chlorine Dioxide	Anolite
Effective						
Safety						
Chlorine Residual						
TTHM / HAA5 Reduction						
Chlorine / Bromate Reduction						
Biofilm Removal						
Algae Elimination						
Micro Flocculation						
Eliminate T. & O.						
Easy to Maintain						
Lifecycle Costs Low						

WHY ENVIROCLEANSE WATER DISINFECTING TECHNOLOGY IS BETTER THAN TRADITIONAL CHLORINATION?

- Although seemingly analogous to chlorine, anolite is unique and clearly superior to sodium hypochlorite in the destruction of spores, bacteria, viruses and other pathogen organisms on an equal residual base. Sodium hypochlorite in concentration of 5% is effective only in disinfection, but not sterilization. Sodium hypochlorite is effective against cysts (Guardia, Cryptosporidium);
- Most of the pathogens, particularly water born, develop resistance to Sodium hypochlorite over time. Anolite application, as water disinfectant on a daily basis for more than ten years, demonstrated that microorganisms do not develop resistance against anolyte over time;
- The required contact time for anolite is lower;
- Sodium hypochlorite loses its activity during long-term storage and poses potential danger of gaseous chlorine emission during storage;
- Anolite is better soluble;
- The bactericidal efficiency remains in pH values between 4 and 9;
- Anolite is minimally corrosive primarily due it's low concentrations and, also due, to the elimination of the caustic element normally found in Sodium and Calcium Hypochlorite;
- The reaction of anolyte and organic materials produces about half of the trihalomethanes as does chlorine;
- Anolite eliminates existing scale and pathogens harbored in scale and blocks dissolved solids in supplied water from forming new scale. Biofilm is eliminated. Sections of a building are not required to be closed to normal use during treatment;



Before dosing anolite

After dosing anolite

- EnviroCleanse Anolite system does not involve hazardous chemicals or burdensome maintenance.