

The Mixed Oxidant Advantage

MIOX technology allows the user to eliminate chlorine gas or bulk sodium hypochlorite in water disinfection. The products are based on a proprietary membraneless electrolytic cell that produces a liquid stream of mixed oxidants that are extremely effective in disinfecting water. The electrolytic cell uses common salt, water, and electricity to generate the oxidant solution, which is collected in a tank and injected into water at rates appropriate for treatment objectives.

Safe and easy to operate, MIOX systems are fully automated, self-diagnosing and neither use nor generate hazardous chemicals.

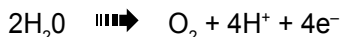


Eliminate Chlorine Gas

THE MIXED-OXIDANT SOLUTION

Anode Reactions

Several reactions are known or possible:



Cathode Reactions

The major electrolytic reaction at the cathode is electrolysis of water:



Bulk Solution Hydrolysis



The sodium ions (Na^+) and chloride ions (Cl^-) in the bulk of the brine provide necessary charge balancing in the cell. (Hydrogen gas is safely vented from the system and poses no safety concern.)

The most easily measured component of the mixed-oxidant solution is free available chlorine (FAC),

the combination of hypochlorous acid and hypochlorite ion. However, the solution exhibits radically improved behavior over traditional hypochlorite solutions, as evidenced by the characteristics described below. These results have been documented by third-party laboratory research and observed in field installations.

CHARACTERISTICS OF MIXED OXIDANTS

- **Superior Microorganism Inactivation.**
Inactivates microorganisms by 1 to 4 logs more than chlorine.*
- **Biofilm Removal.**
Eliminates distribution system biofilms and prevents regrowth.
- **Lower TTHM Formation.**
Typically reduces TTHM formation by 20% to 50% throughout the distribution system.
- **Chlorine Residual Maintenance.**
Reduces initial chlorine dose by up to 30% after the system has stabilized. Maintains a durable residual far beyond what traditional chlorination is able to achieve.
- **Microflocculation.**
Causes a microflocculation effect in clarifiers similar to that of ozone. Can reduce coagulant consumption up to 40%, increase filter runs and reduce sludge handling when used in pretreatment.
- **Oxidation of Iron and Manganese.**
Oxidizes iron and manganese, leading to precipitation of a solid phase that can be removed by standard coagulants and sometimes by filtration and/or settling alone.
- **Oxidation of Sulfides.**
Oxidizes sulfides without creating taste and odor and without first having to satisfy the full background chlorine demand of the water.
- **Ammonia Oxidation at Sub-breakpoint Doses.**
Removes ammonia and chloramines typically at doses well below those required for classical breakpoint chlorination.
- **Improved Taste and Odor.**
Imparts no chlorine taste even with FAC residuals up to 3 mg/L. Does not react to form di- or tri-chloramines, a primary source of taste and odor. Avoids problems associated with algae growth.

* The Centers for Disease Control (CDC) reports inactivation of *Cryptosporidium* with mixed oxidants by > 3.5 logs (>99.95%), as compared to no inactivation whatsoever by hypochlorite at equal FAC residuals.