PRODUCT TECH SHEET

JC 9450 — Mineral Oxychloride

An NSF/ANSI Standard 60–certified advanced oxidant that generates reactive oxygen species (ROS) — delivering ozone-class oxidation power for water, wastewater, oil & gas, cooling-tower and agricultural treatment.

2.8–2.9 V	84 mg/L	6.60 log
ELECTROCHEMICAL OXIDATION POTENTIAL	NSF STD 60 MAX. CERTIFIED DOSE	SALMONELLA REDUCTION AT 2 PPM

What It Is

JC 9450 is a chelation of minerals with oxygen in liquid form — a mineral oxychloride. Its molecules are purposely designed to be weakly bound, so that on contact with inorganics, microorganisms and organic matter it readily releases oxygen atoms that aggressively oxidize the target contaminants.

The reactivity of JC 9450 is closely matched to ozone, but without the handling problems associated with dissolving a gas in water. When added to a water stream it raises the oxidation-reduction potential (ORP), behaving like "biologic water": its active ions interact with the water and substrates they contact to deliver greater oxidation energy while conserving that energy in solution.

How It Works

Conventional sodium hypochlorite dissociates into a limited set of active ions ($NaOCl \rightarrow HOCl + OCl^- + OH^-$). JC 9450 adds a proprietary catalyst that both increases the availability of these active ions and generates multiple oxygen-radical complexes: Catalyst + $NaOCl \rightarrow HOCl + OCl^- + OH^-$ + M complexes.

These mineral–oxy complexes carry a far higher oxidation potential than the oxygen molecule alone. A distinctive feature of mineral oxychlorides is that they release single atoms of oxygen embedded within the molecular structure of organic material and pathogens — perpetuating the release of highly active oxygen and driving oxidation deep into the contaminant.

> *Reactivity closely matched to ozone — without the problems of dissolving a gas in water.*
>
> JC 9450 mineral oxychloride technology

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Reactive Oxygen Species Chemistry

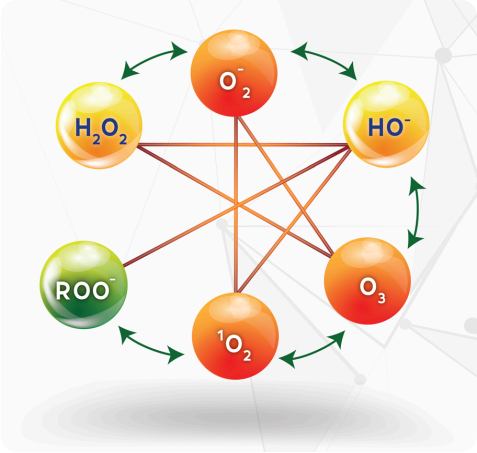
Decomposition of water and oxo-compounds generates a family of reactive oxygen species (ROS) at successive oxidation states: superoxide (O_2^-), hydroxyl radical (OH^-), singlet / nascent oxygen ($^1O_2$), hydroperoxyl (HO_2^-) and peroxide (H_2O_2).

JC 9450 mimics biochemical water in both the production of these oxygen species and the conservation of their ionic energy. Its ORP contribution derives from the electrochemical potential of the reactive oxygen species it carries — at roughly 2.8 V it sits alongside the hydroxyl radical and just below fluorine, far above chlorine (1.36 V) and ozone (2.07 V).

HO radicals and singlet oxygen, generated as reactant by-products, exhibit very high reactivity against a broad range of organic compounds — the same advanced-oxidation mechanism prized in AOP systems, delivered without a gas-injection train.

OXIDATION POTENTIAL OF COMMON OXIDANTS

REAGENT	FORMULA	VOLTS
Fluorine	F_2	3.06
Mineral Oxychloride	$M_xO_yCl_t$	2.8–2.9
Hydroxyl Radical	OH•	2.80
Oxygen Ion	O^-	2.42
Ozone	O_3	2.07
Hydrogen Peroxide	H_2O_2	1.78
Perhydroxyl Radical	HO_2	1.70
Chlorine Dioxide	ClO_2	1.57
Hypochlorous Acid	HOCl	1.49
Chlorine Gas	Cl_2	1.36
Oxygen (Molecule)	O_2	1.23
Hypochlorite Ion	OCl^-	0.94
Sodium Hypochlorite	NaOCl	0.94
Hydroperoxide Anion	HO_2^-	−0.88
Superoxide Radical	O_2^-	−2.40



The spectrum of reactive oxygen species generated and interconverted by JC 9450.

Disinfection Efficacy

Against *Salmonella enterica* 10708, JC 9450 achieves a 6.60-log reduction at just 2 ppm — outperforming hypochlorite at 50× the dose.

SOLUTION	DOSE (PPM)	CFU/ML @ 0	CFU/ML @ 30 MIN	LOG REDUCTION
Hypochlorite	10	2.00×10^7	1.89×10^5	2.02
Hypochlorite	100	1.58×10^7	<5	6.49
JC 9450	**2**	**2.00×10^7**	**<5**	**6.60**

Microorganism: Salmonella enterica 10708. CFU/ml measured at time zero and after 30 minutes.

Dosing & ORP Control

ORP is the practical control tool for JC 9450: dosing to a target oxidation-reduction potential ensures the desired result with less product, and residues fall well below the FDA Maximum Contaminant Level. Typical reactivity ratios:

Inorganics — <1.0 mg/L per mg/L of inorganic

Pathogens — 1.0 mg/L per 1,000–10,000 mg/L pathogen

Organics — 1.0–8.0 mg/L per 1.0 mg/L organics

Residual — mineral-oxide by-products protect against bacterial recontamination.

ORP BENCHMARK — DISINFECTION	
ORP (MV)	**CFU / 100 ML**
+200	300
+300	36
+400	3
+600	**0 — disinfection**
+800	**0 — sterilization**

Comparison of Oxidants

TREATMENT TARGET	OZONE	JC 9450	CHLORINE	H_2O_2	K PERMANG.
Hydrogen sulfide	Good	Excellent	Good	Excellent	Good
Ferrous ion	Good	Excellent	Good	Good	Good
Manganous ion	Fair	Excellent	Fair	Fair	Good
Color	Excellent	Good	Good	Good	Good
Reduce Cl-organic precursors	Poor	Good	Unacceptable	Poor	Poor
Common odors	Excellent	Excellent	Good	Good	Good
Earthy / musty odors	Good/Exc.	Excellent	Unacceptable	Poor	Fair
Enhance coagulation	Good/Exc.	Excellent	Good	Fair	Fair
Residual maintenance	Unacceptable	Excellent	Good	Unacceptable	Unacceptable
Overall rating	**Good/Exc.**	**Excellent**	**Fair**	**Good**	**Fair**

Applications

Municipal water & wastewater — disinfection, iron and manganese removal, taste-and-odor control, and reduction of chlorinated-organic precursors, as an advanced-oxidation alternative to ozone and chlorine.

Oil & gas — oxidation of hydrogen sulfide and reduced species in produced and process water.

Cooling towers — microbiological control with a protective mineral-oxide residual that guards against recontamination.

Agriculture — low-chloride disinfection that avoids the chlorinated-organic and chloride residues of conventional chlorine chemistry.

KEY PROPERTIES	
Form	Liquid oxidizer
Chemistry	Mineral oxychloride
Oxidation potential	2.8–2.9 V
Primary ROS	OH•, O_2^-, $^1O_2$
By-product	Mineral oxides
Certification	NSF/ANSI Std 60
Max dose	**≤ 84 mg/L**

Certifications

NSF/ANSI Standard 60 Certified | Drinking Water ≤ 84 mg/L | Residues Below FDA MCL | Biodegradable By-products

Safety & Handling

JC 9450 is a liquid oxidizer and should be handled with standard oxidizer precautions: store in a cool, ventilated area away from incompatible reducing agents, use appropriate eye and skin protection, and dose with calibrated metering equipment. Because the chemistry is pH- and temperature-sensitive, ORP monitoring is recommended for consistent performance.

The oxidation by-products are mineral oxides that behave as micronutrients — they readily break down and are consumed by nature, leaving residues that fall well below the FDA Maximum Contaminant Level. Consult the current Safety Data Sheet before use.

REQUEST A SPECIFICATION OR TRIAL

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