

FMC's OxyPure™ HYDROGEN PEROXIDE

NSF INTERNATIONAL CERTIFIED

FMC's OxyPure' hydrogen peroxide is certified by NSF International for use in the treatment of drinking water under ANSI/NSF Standard 60 Drinking Water Additives-Health Effects.

- Ground Water
 - Hydrogen Sulfide Removal
 - Iron Removal
 - Contaminated Well Remediation
- Surface Water
 - Taste and Odor Control
 - Residual Ozone Destruction
- Other Applications
 - Ozone Replacement/Enhancement
 - Chlorine Replacement/Reduction
 - Control of Iron Bacteria
- High Purity Grade H2O2 Product
 - 35% and 50% Concentrations
 - Carefully Audited Manufacturing Practices
 - Dedicated Handling & Delivery Equipment
 - Available in 15, 30 and 55 Gallon Drums or Bulk

Specifications

Active Oxygen, by weight
Color
Odor
H₂O₂ grams per liter @ 200C

35% H₂O₂

16.5%
Clear, colorless
Slightly pungent
396

50% H₂O₂

23.5%
Clear, colorless
Slightly pungent
600

Storage and Handling

OxyPure™ hydrogen peroxide is an oxidizer and must be handled as described in NFPA Bulletin 43A. It should be stored in its original container and never be replaced back into the original container after use.

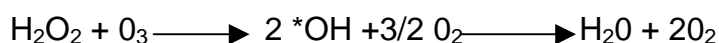
Personal Safety

Rubber gloves, eye and face protection should be employed. In case of direct skin or eye contact flush area with a copious amount of water, then seek medical attention.

Residual Ozone Destruction

SURFACE WATER TREATMENT

Ozone treated drinking water can contain small quantities of residual ozone that could be released into the atmosphere in certain water treatment plant stages, e.g. mix tanks, filters, etc. OxyPure™ hydrogen peroxide can be added to ensure destruction of residual ozone and minimize ozone release.



For 1 mg/L ozone, 1.4 mg/L 50% OxyPure™ must be added.

Advantages

- Fast reaction rate
- Easily administered
- Increased oxidation power
- Low capital
- Low operation and maintenance

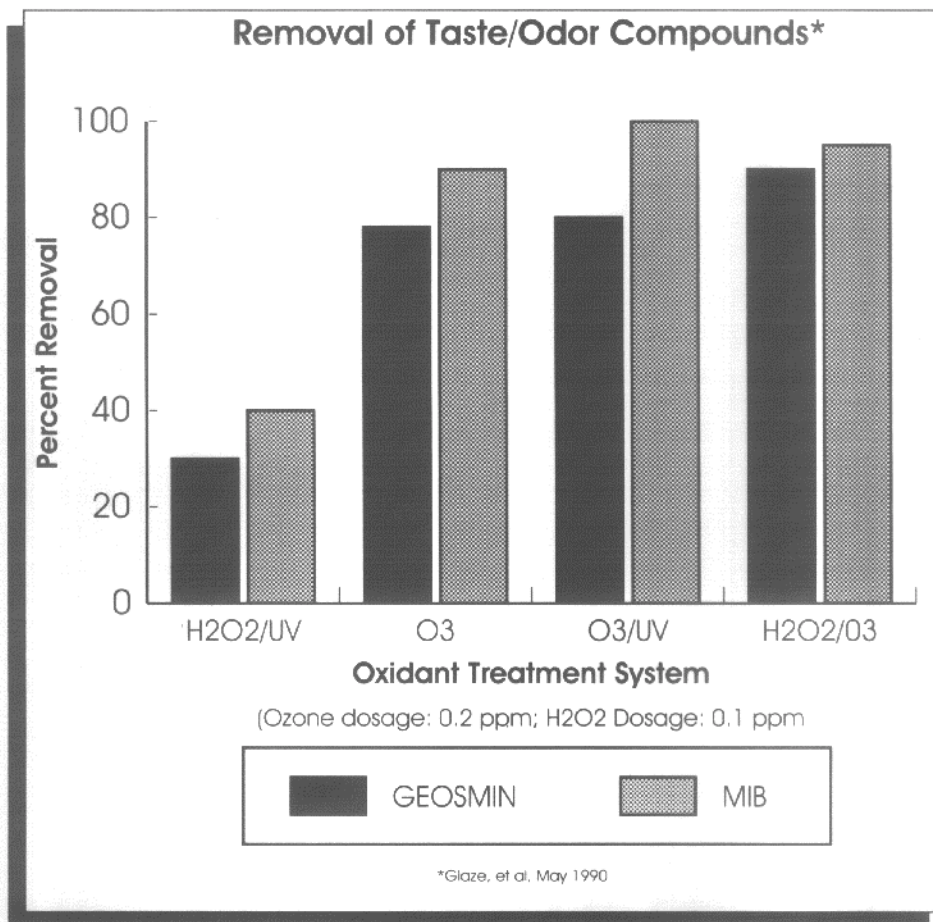
Taste/Odor Removal - Ozone Enhancement

SURFACE WATER TREATMENT

Hydrogen peroxide based advanced oxidation processes (AOP) combine hydrogen peroxide with ozone and/or ultraviolet light. These processes are effective in the removal of organics in drinking water systems.

The treatment of drinking water with OxyPure™ hydrogen peroxide and ozone combinations is of particular interest to municipalities investigating new drinking water treatment facilities to meet increasing demand while complying with disinfection and disinfection by-product rules under the Safe Drinking Water Act.

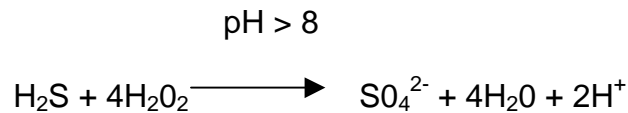
Geosmin and MIB (2-methyl-isoborneol) are drinking water contaminants that impart taste and odor in potable water supplies. AOP is more effective in the reduction of these compounds than ozone.



Hydrogen Sulfide Removal

GROUND WATER TREATMENT

Hydrogen sulfide, H₂S, is a common taste and odor compound found in underground potable water sources, OxyPure™ can successfully oxidize the H₂S to remove the taste and odor associated with sulfides. The oxidation reaction can be controlled under alkaline conditions to produce sulfate and a minimal amount of colloidal sulfur, Since sulfate is the major product under alkaline conditions, turbidity is minimized.



Advantages of OxyPure™ Treatment System

- Economical
- No toxic fumes
- Easily administered
- No harmful by-products

Comparison of OxyPure™ to Other Chemical Removal Systems

	OxyPure™ H ₂ O ₂	KMnO ₄	Chlorine
Physical Form	Liquid	Solid	Gas
Oxidation Potential	1.77 V	1.67 V	1.36V
Reaction Time	Minutes	Minutes	Minutes
Product Cost (\$/#)	\$0.65*	\$1.34**	\$0.12**
Predominant Product	SO ₄ ⁼	S, SO ₄ ⁼	SO ₄ ⁼ , S
Decomposition Products	H ₂ O, O ₂	MnO ₂	Chlorinated Species
Requirement for 1 mg/L H ₂ S	4.0 mg/L	6.2 mg/L	8.3 mg/L
Cost \$/MG	\$44.00	\$53.00	\$10.00

*List price for 50% OxyPure™, bulk tank trucks, as of May 22, 1995

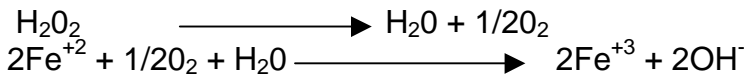
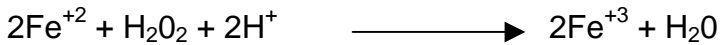
**CMR, May 22, 1995

Iron Removal

GROUND WATER TREATMENT

The removal of iron from potable water sources is aesthetically advantageous, since iron can discolor the water, spot laundry and stain plumbing fixtures. In addition, the growth of iron bacteria can result in abnormal taste and odor and bio-fouling in the water system.

OxyPure™ hydrogen peroxide is very effective in the oxidation and precipitation of iron, OxyPure™ rapidly oxidizes iron to form dense, easily settled solids which conventional flocculation/precipitation/filtration systems are able to remove.



Advantages of OxyPure™ System

- Economical
- Easily settled solids
- Fast reaction rate
- Minimal equipment requirements

Compared to other oxidation technologies, OxyPure™ is a cost effective alternative.

Iron Removal Costs

Midwestern Ground Water Sources
 Raw Water Iron: 8.4 mg/L
 Treatment Target for Iron: <2 mg/L

	50% OxyPure™	Chlorine	KMnO ₄
Equipment Cost	\$217,000	\$264,000	\$216,000
O&M Cost/Year*	\$ 29,000	\$ 36,000	\$ 33,000

*Includes flocculation and settling chemicals

Lin and Raman, 1990