

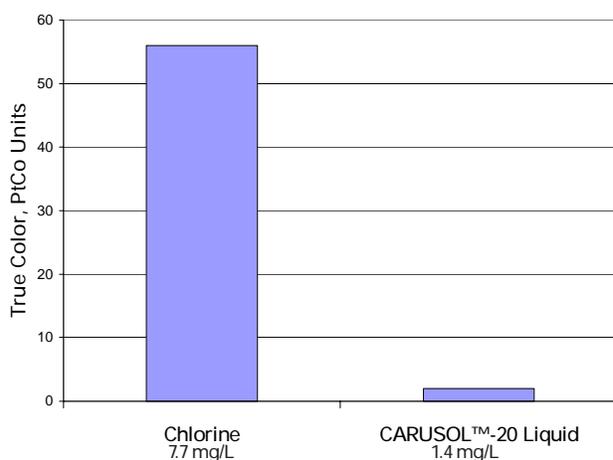
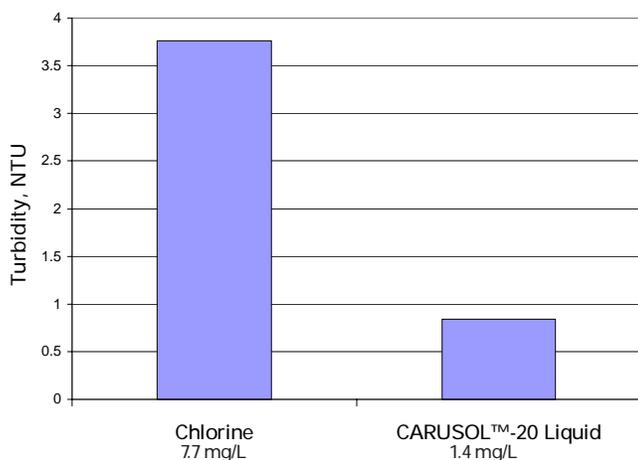
Case History

Background

Queensboro Water Treatment Plant in Bear Mountain, New York has an average flow of 150,000 GPD. In the summer of 2000, the plant personnel replaced chlorine with permanganate as a pre-oxidant to control iron, manganese, tastes, odors, color, and turbidity. CARUSOL™-20 Liquid Permanganate was chosen over the granular potassium permanganate because it could be easily stored and handled. The feed equipment was simplified, and the manpower needed would be minimized.

CARUSOL™ Application

Due to the lack of space, manpower, and low permanganate consumption, the use of chemical feed equipment for standard CAIROX® Potassium Permanganate was impractical. Carus Chemical Company recommended CARUSOL™-20 Liquid Permanganate, a newly developed 20% permanganate solution. CARUSOL™ liquid was injected into the plant influent before the flocculation tank at a rate of 1.8 gallons per day (150,000 GPD plant flow). The results of the full-scale evaluation are summarized in the following table. As seen, significant reductions in iron, manganese, true color, and turbidity levels are realized when CARUSOL™ liquid permanganate is used as a pre-oxidant.



Contaminant	Cl ₂ as pre-oxidant	CARUSOL™-20 as pre-oxidant
Iron (mg/L)	0.12	0.06
Manganese (mg/L)	Not Available	0.008
True Color (PtCo)	56	2
Turbidity (NTU)	3.76	0.84

Conclusions and Observations

- √ Effectively replaces chlorine as a pre-oxidant.
- √ Significantly reduces iron, manganese, true color, and turbidity levels in the finished water.
- √ Improves tastes and odors.
- √ Enhances floc settling, aids in coagulation, and reduces polymer usage.
- √ Controls THM and HAA formation at the beginning of the treatment process.

For further information on CARUSOL™-20 Liquid Permanganate product characteristics and availability, contact Carus Chemical Company at 1-800-435-6856.

LABORATORY SUPPORT

Carus Chemical Company has technical assistance available to answer questions, evaluate treatment alternatives, or perform laboratory testing. Our laboratory capabilities include; Feasibility Studies, Treatability Studies and Analytical Services.

FIELD SERVICES

As an integral part of our technical support, Carus provides extensive on-site treatment assistance. We offer full application services, including technical expertise, supervision, testing, and feed equipment design and installation in order to accomplish a successful evaluation and/or application.

ENGINEERED SYSTEMS

In addition to chemical, Carus provides engineered systems for solid/crystalline CAIROX[®] potassium permanganate. Standard Feeders are designed specifically for CAIROX[®] potassium permanganate. Various options and accessories are available to meet a wide range of applications. Custom-Engineered Feed Systems are complete, pre-engineered and pre-packaged systems. They provide efficient, dust-free methods of storing, mixing, and feeding CAIROX[®] potassium permanganate. System designs are customized to meet specific applications and customer needs.

ADDITIONAL TECHNICAL BULLETINS

CARUSOL[™] Liquid Permanganate Fact Sheet (Form # LX 11001)
Carus Chemical Company-Who we are and what we do (Form # CC100)
CAIROX[®] Potassium Permanganate Oxidizes Manganese (Form # CX 3304)
Equipment Selection and Application Guide (Series 2000)

CARUS CHEMICAL COMPANY

During its more than 80-year history, Carus' ongoing reliance on research and development, as well as its emphasis on technical support and customer service, have enabled the company to become the world leader in permanganate, manganese, oxidation, and base-metal catalyst technologies.

ACKNOWLEDGEMENT

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Carus Chemical Company

315 Fifth Street

P. O. Box 599

Peru, IL 61354

Tel. (815) 223-1500

Fax (815) 224-6697

Web: www.caruschem.com

E-Mail: salesmkt@caruschem.com



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