Permanganate is used in the iron (Fe) and manganese (Mn) removal processes in both surface water and ground water systems that employ filtration. Permanganate oxidizes soluble iron and manganese to insoluble precipitates. The precipitates are removed from the water supply in the clarification and filtration processes.

Factors that affect removal efficiency include water chemistry, pH, temperature, and application point. Reaction times are rapid under normal conditions of temperature and pH. Generally, temperatures <35°F, and pH values <5.5 require reaction times longer than two minutes. In most cases, 5 to 10 minutes of reaction time is sufficient.

Permanganate quickly oxidizes Fe²⁺ and Mn²⁺ in most cases without pH adjustment. The freshly precipitated iron or manganese floc will further adsorb metal ions and organic compounds while enhancing the effectiveness of the coagulation process.

Permanganate also:
- helps control tastes and odors,
- aids in the coagulation process, and
- acts as a substitute oxidant to chlorine in a disinfection by-product control program.

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### References


LABORATORY SUPPORT

Carus Chemical Company has technical assistance available to answer questions, evaluate treatment alternatives and 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.

EQUIPMENT SERVICES

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.

CARUS CHEMICAL COMPANY

During its more than 90-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.