The Urgent Need to Replace the Use of Bulk Ferric Chloride with a More Sustainable Technology

With increasing concerns about the quality of bulk reagents such as bulk ferric chemicals that are widely used in the water treatment industry, utilities are seeking alternative, more carbon neutral, and environmentally friendly treatment methods. AMS' SafeGuard™ H2O technology is a sustainable alternative that responds to that need.

SafeGuard™ H2O has numerous advantages over traditional coagulation processes that depend on bulk ferric chloride. The on-site generation of a ferrous/ferric reagent available through the SafeGuard™ H2O system requires a smaller footprint, and it offers greater reliability to utilities looking to reduce GHG emissions. SafeGuard™ H2O also has a 30 - 50% lifetime cost advantage, considering the cost of purchasing bulk chemicals, manual process supervision, and waste disposal.

Generation of Water Treatment Chemicals On-Site and On-Demand

SafeGuard™ H2O is a fully automated advanced water treatment system that generates a ferrous/ferric reagent on-site and on-demand, replacing the use of toxic and hazardous bulk ferric in traditional reduction-coagulation-filtration processes. The technology works to remove a wide range of inorganic, organic, and trace metal contaminants by using a non-toxic, certified reagent precursor material (low carbon steel) and an in-situ electrolytic generator to create a non-hazardous reagent.

Traditional electrocoagulation technologies are limited in size, have high power and maintenance requirements, and their performance is compromised by the inability to control pH and the electrolytic process. SafeGuard™ H2O is optimized for treatment because the pH of the produced reagent can be modified and tightly controlled, as a result, dosing rates

are lower than that of bulk ferric salts which results in lower volumes of waste. The onsite-generated ferrous reagent can be stored and is produced using low-power electricity that lends itself to the use of renewable energy sources or off-peak electricity. The system is fully automated, and can be controlled remotely, making it highly attractive for remote, unattended sites. System performance is continuously monitored 24/7/365.

Quality of On-Site Generated Ferrous/Ferric Reagent Surpasses Bulk Reagents

While ferric chemicals are a proven low-cost treatment option to remove contaminants from drinking water supplies, there is a growing awareness of the lack of adequate quality controls and certifications of these chemicals.

Whereas bulk ferric chemicals often have significant levels of co-contaminants (e.g. manganese and other trace metals) that compromise treated water quality and the environment, the high purity of the electrode precursor material used in SafeGuard™ H2O has minimal and predictable effects (Table 1) and the produced reagent concentration is tightly controlled.

Table 1: Laboratory Analysis Results of 39% Bulk Ferric Chloride Reagent & Electrogenerated Ferrous Reagent

Parameter	Bulk Ferric Chloride Reagent (mg/L)	Electrogenerated Ferrous Reagent (mg/L)
Antimony	0.378	0.0008
Beryllium	0.002	< 0.0006
Copper	112.91	2.56
Iron	> 14000	2865.35
Lead	< 0.001	< 0.001
Manganese	951.48	5.789
Molybdenum	8.092	1.159
Nickel	21.546	0.841
Selenium	0.094	0.004
Silver	0.122	0.006
Thallium	< 0.0002	< 0.0002
Zinc	28.8	0.97
Source: Analytical Results conducted by SDC Laboratory located at Tierra Del Sol Industrial Park, 2329 Lava Lane, P.O. Box 642, Alamosa, CO 81101		

As a result, SafeGuard™ H2O is poised to replace the use of hazardous bulk reagents since it does not compromise the quality of drinking water, harm the environment and it can be produced using renewable energy sources and stored for later use when these are unavailable.

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