THIOGUARD® TST

PREMIER CHEMICALS, LLC

HILL BROTHERS Chemical Co.

Premier Technical Resources — Magnesia Specialty Chemicals

Hill Brothers Chemical Company – Western Region Thioguard Supply

THIOGUARD® Bridges the Cation Gap - Saves Biosolids $$

Did you know?

- Relevant cations in an activated sludge treatment process to be considered in the M/D ratio include: NH_4^+ , Na^+, K^+, Ca^{+2}, and Mg^{+2}
- The optimal M/D cation ratio was found to be approximately 2.0.
- The effects of cations in bio-floc, and impacts to SVI, CST, SRF and Cake Solids %, are explained by Divalent Cation Bridging Theory (DCBT), which describes parallels in the exchange of monovalent and divalent cations in the bio-floc matrix and the exchange of these same cations in water softener resins.

THIOGUARD® TST is a non-hazardous application with no required reportable quantities (RQ = None)

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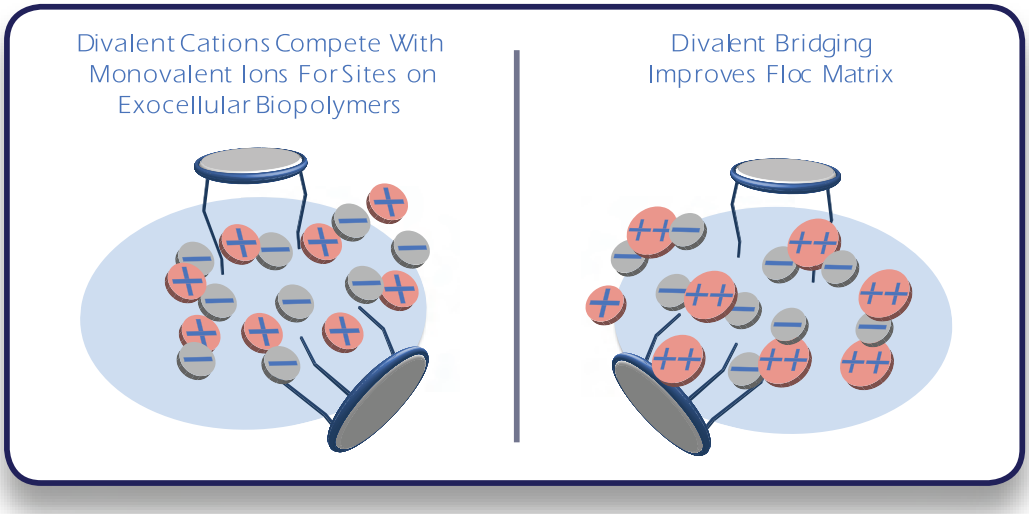
Problem: WWTP effluent and biosolids qualities vary for several reasons, many times due to unmeasured changes in wastewater chemistry. One of the more common, but often unmeasured, factors affecting effluent quality is cation balance, which in recent years has been quantified using the Monovalent/Divalent (M/D) Cation Ratio. Excessive quantities of monovalent cations, whether from domestic sources such as common household detergents or sodium based water softeners, or from industrial sources that use caustic soda as a neutralizing agent, can cause poor flocculation and settling, in addition to a deterioration in dewatering properties, possibly leading to permit violations for effluent BOD and TSS, and high biosolids disposal costs.

Background: The role of cations in biological treatment systems has been studied by several academic researchers since the mid-1970s. The results of that and ongoing research have outlined the significant role of relative cation concentrations on process values within an activated sludge plant that include: SVI (Sludge Volume Index), CST (Capillary Suction Time), SRF (Specific Resistance to Filtration), Cake Solids %, and Floc Strength.

These values can subsequently be correlated to effluent quality, polymer use, dewatering process efficiency, and ultimately to the costs of handling and disposing of biosolids.

A significant amount of work on cations in activated sludge systems was performed by Dr. John Novak of Virginia Tech and Dr. Matthew Higgins of Bucknell, both of whom are prolific contributors to WEF publications, conferences and seminars, as well as participants on many WERF funded projects.

Solution: THIOGUARD®, magnesium hydroxide, contributes to wastewater treatability by adding alkalinity and buffering pH in systems that are found to be deficient in both of these parameters. **THIOGUARD®** also adds divalent cations into the process stream, helping to improve BOD, TSS and Turbidity effluent qualities, as well as SVI, CST, SRF, and Cake Solids %, leading to savings in polymer use and biosolids dewatering and disposal costs.



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Corporate HQ
Hill Brothers Chemical
800.994.8801
infomail@hillbrothers.com

California/Nevada
Brea Sales Office
(800) 438-8515

Arizona/New Mexico
Phoenix Sales Office
(623) 879-9210

Utah/Rocky Mtn's/PNW
North Salt Lake Office
(800) 336-3911