

# THIOGUARD® TST

Premier Technical Resources — Magnesia Specialty Chemicals

Hill Brothers Chemical Company – Western Region Thioguard Supply



HILL BROTHERS *Chemical Co.*

## Did you know?

The rate of sulfide oxidation is driven by several factors: wastewater redox potential, pH, metal ion concentration, biological activity

Metal cations catalyze the rate of sulfide oxidation from 5 to 100 times

THIOGUARD® shifts pH to favor  $\text{SO}_4$  species in the  $\text{SO}_4/\text{HS}$  equilibrium

THIOGUARD® holds sulfides in solution or in complexes until the wastewater reaches a more oxidative environment

## Oxidation of Sulfides

In wastewater, sulfides are the primary culprit among malodorous compounds that are most complained about by the general public. And as a result, there are numerous products in the marketplace utilizing various mechanisms to address the odors stemming from sulfides.

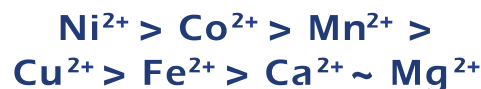
THIOGUARD® uses a variety of mechanisms to control sulfide: Adsorption, neutralization, pH elevation and stabilization, species complexation, biological interference, and oxidative catalysis.

The oxidation of sulfides occurs both organically and inorganically, through biological and/or chemical mechanisms. Biological mechanisms depend on microbial activity, which is subject to environmental factors such as temperature, pH, food availability and an oxygen source. Although research has indicated that sulfides will rapidly oxidize in the presence of dissolved oxygen, chemical

mechanisms rely on pH, redox potential, oxygen source and metal ions for catalysis and rate of oxidation.

Oxidative catalysis with THIOGUARD® occurs from the addition of a light metal cation and pH elevation, which affects both chemical and biological pathways.

Studies by several researchers indicate the addition of metal cations increase the rate of sulfide oxidation from 5 to 100 times, in decreasing order of activity as follows:



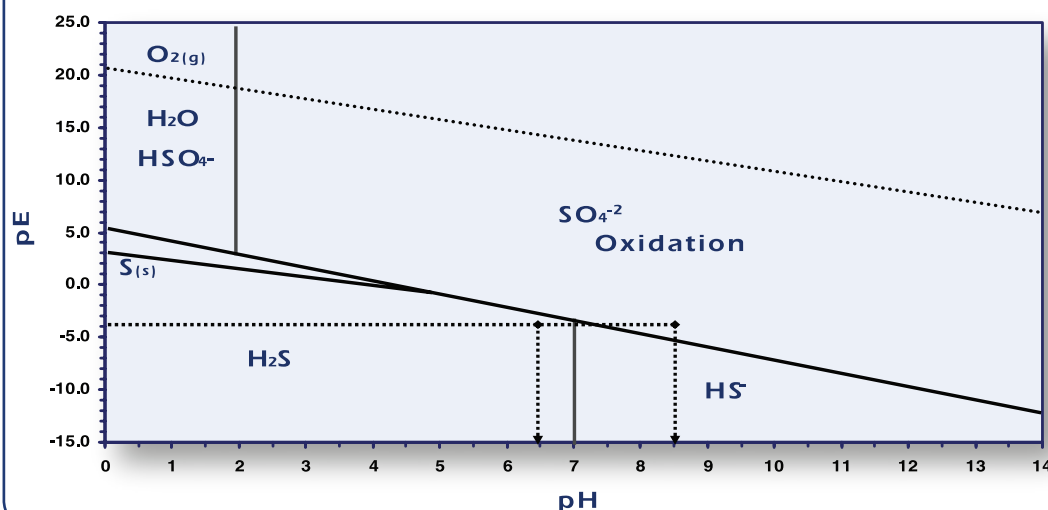
In addition, THIOGUARD® increases pH, which in turn shifts the  $\text{SO}_4/\text{HS}$  equilibrium to favor the  $\text{SO}_4$  species as shown in the Pourbaix Diagram below.



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

Find us online at:  
[www.hillbrothers.com](http://www.hillbrothers.com)  
or  
[www.THIOGUARD.com](http://www.THIOGUARD.com)

pE-pH Diagram Sulfide-Sulfate Oxidation



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