

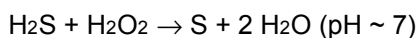
Applications of Hydrogen Peroxide

Hydrogen Peroxide for Sulfide Removing Process

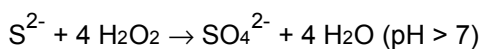
Hydrogen peroxide plays a vital role in environmental protection by deodorizing and destroying hydrogen sulfide (H₂S), mercaptans, and other inorganic and organic sulfides in industrial, commercial and domestic wastes. The familiar "rotten egg" odor makes the presence of hydrogen sulfide known even at low, subtoxic concentrations. Hydrogen sulfide, even at these low levels, leads to costly corrosion of pump station equipment and deterioration of concrete sewer pipes, chambers and wastewater treatment plant facilities. In higher concentrations (100 ppm), hydrogen sulfide can impair worker health, and at 300 ppm it can be lethal in an enclosed area. Hydrogen peroxide provides a two-fold oxidation functionality in wastewater treatment to combat sulfide odors:

1. Hydrogen peroxide oxidizes hydrogen sulfide and other sulfides, while simultaneously suppressing bacterial activity likely to lead to hydrogen sulfide formation.
2. Hydrogen peroxide supplies dissolved oxygen to the drain or sewer system, avoiding the anaerobic conditions required by sulfate-reducing bacteria that lead to the initial sulfide formation.

Hydrogen peroxide reacts with hydrogen sulfide through two ways. The first route is selective oxidation, where the peroxide attacks hydrogen sulfide to form elemental sulfur and water:



The colloidal sulfur, biologically inert and adsorbed onto sludge particles, can be readily disposed of with the sludge. The second route not only oxidizes the sulfur formed in the preceding equation, but also breaks down other sulfides present in the sewage to form sulfates:



The reaction products do not add dissolved contaminants, and the decomposition of hydrogen peroxide, under typical sewage conditions, yields only oxygen and water.

In sewage systems and municipal wastewater treatment plants hydrogen peroxide is dosed into the effluent in pump houses and sludge press buildings. In industrial wastewater treatment, e.g. in petroleum refineries, where sour water from the oil desulfurization has to be treated hydrogen peroxide is dosed between the oil separator and the flotation and prior to the final biological treatment.



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