

Applications of Hydrogen Peroxide

Hydrogen Peroxide for BOD / COD / TOC Reduction and Improvement in Biodegradability

Hydrogen peroxide is added to wastewater treatment plants and lagoons to increase the Dissolved Oxygen (DO) level, and improve biological degradation of pollutants or to directly oxidize inorganic and organic reducing species.

Hydrogen peroxide works in two different ways:

H₂O₂ can directly oxidize sulfides, sulfites, nitrites and a number of other inorganic and organic compounds. The Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Organic Carbon (TOC) and toxicity of the water will be reduced directly in this way. Often organic substances can be oxidized partly with hydrogen peroxide, resulting in reaction products, which are easily biodegradable.

H₂O₂ delivers available oxygen to microorganisms to aid in biodegradation of many pollutants. As long as the concentration of hydrogen peroxide does not exceed the toxicity level for microorganisms (around 400 ppm), all organisms will have the capability of decomposing H₂O₂ through their enzyme systems (catalase and peroxidase) into oxygen and water.

In practice, both actions take place leading to a significant reduction of BOC, COD and TOC in the wastewater. Because peroxide does not add any other substance to the water like permanganate or hypochlorite, nor does it form other toxic substances like chlorinated organic compounds, it is the oxidizer of choice.

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