

Carbon Dioxide Replaces Acid to Reduce pH

Replacing mineral acid with carbon dioxide (CO₂) in alkaline water is an effective, reliable, self-buffering and economical method of controlling pH levels. Praxair offers the best in service and supply to meet all your pH control needs. Carbon dioxide is a safer alternative than mineral acids and an effective chemical for lowering the pH of various kinds of alkaline waters. When CO₂ is dissolved in water, it goes through a series of chemical reactions as shown below.

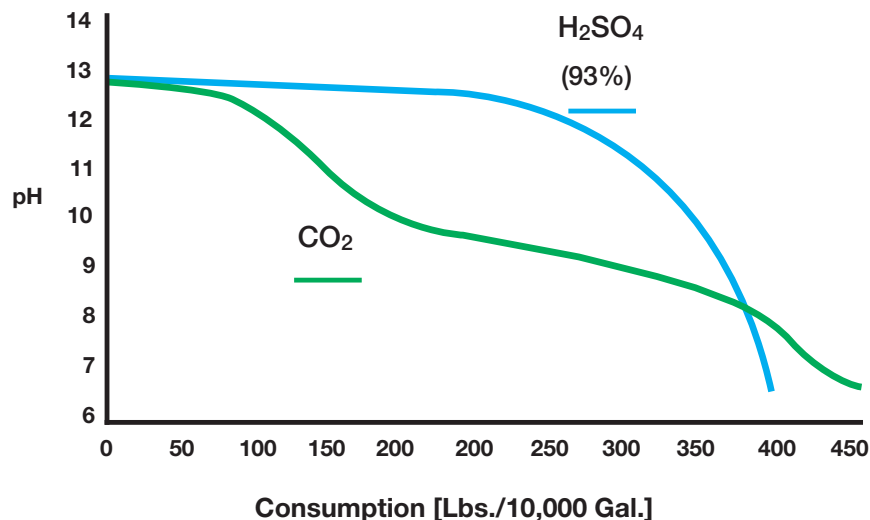


Initially, dissolved CO₂ forms carbonic acid, which subsequently dissociates into bicarbonates, carbonates and hydrogen ions. The hydrogen ions in turn reduce the pH. Praxair's water quality testing capabilities analyze water samples taken directly from customer facilities to demonstrate the effectiveness of CO₂ versus sulfuric acid.

Advantages of Carbon Dioxide

- Cost-effective
- Optimal pH control
- Self-buffering
- Eliminates on-site acid storage and handling
- Lowers system maintenance costs
- Lowers piping system installation costs

Typical Graph of CO₂ vs. H₂SO₄ Effectiveness



Custom-Engineered CO₂ Neutralization Systems

Praxair has extensive, multi-decade experience in designing and installing custom-engineered systems to meet any water treatment need.

CO₂ treatment areas include:

- Basins
- Holding ponds
- Pipelines
- Sumps
- Pressurized vessels
- Tanks

This experience includes both liquid and gaseous CO₂ delivery systems that utilize a wide variety of injection techniques. Selecting the proper CO₂ injection equipment is based upon the specific requirements of each installation. This ensures that every treatment system is tailored to provide the safest, most efficient and economical neutralization of alkaline water.

For large basins or holding ponds, Praxair can provide a variety of in-tank CO₂ injection methods. This includes the sparger and the diffuser systems. All of Praxair's CO₂ injection systems are built from durable components, such as stainless steel, to provide lasting reliability. All of these systems are designed for long service life with minimal maintenance and operator attention.

Praxair has developed patented technology for both equipment and processes that can provide you with improved neutralization performance. CO₂ neutralization technology is cost-effective, environmentally responsible and can provide greater control over the pH adjustment process.

A Broad Range of Control Applications

Carbon dioxide is utilized for pH control in many industries including:

- Food
- Textile
- Pulp and paper
- Chemical
- Petroleum
- Municipal facilities

Main uses of carbon dioxide for water treatment include:

- Effluent water treatment
- Process water pH control
- Drinking water re-carbonation

Superior Systems

Praxair provides everything you need for superior CO₂ water treatment systems including:

Engineering

- Determination of system requirements
- Water sample test program
- Custom injection and control system design
- Start-up and optimization of system

Installation Services

- Bulk tank installation
- Piping systems
- Field service representatives

Product Supply

- Strategic worldwide placement of production plants
- Nationwide network of supply depots
- Dependable fleet of delivery vehicles

One Source for All Your Needs

Praxair, the largest supplier of CO₂ in North and South America has the resources, experience, technical know-how and supply network to meet today's requirements for pH control. Each regional office has a staff that includes application engineers and service personnel to ensure that every installation meets the specific requirements of your application and provide ongoing support.

In addition, our R&D facility near Chicago provides a complete analytical gas laboratory, a water neutralization test program and technical application support that ensures the highest quality product and state-of-the-art technical backup.

Praxair has a network of strategically located plants, depots and sales offices available to serve all your needs. Praxair also maintains a large fleet of tanker trucks and railcars, allowing quick delivery of CO₂ wherever it is needed. Our storage vessels are manufactured to the highest quality standards, using the latest construction technology for long life, minimum maintenance, energy savings, automatic operation, safety and reliability.

Contact Praxair at 1-800-PRAXAIR or via the web at www.praxair.com/wastewater.



© Copyright 2016 Praxair Technology, Inc. All rights reserved.

Praxair, and the *Flowing Airstream* design and *Making our planet more productive*, are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries. Other trademarks used herein are the registered trademarks of their respective owners.

The information contained herein is offered for use by technically qualified personnel at their discretion and risk without warranty of any kind.

10-16
P-10419

Praxair, Inc.
39 Old Ridgebury Rd.
Danbury, CT 06810-5113
USA
www.praxair.com
info@praxair.com

Telephone:
1-877-PRAXAIR (1-877-772-9247)
Fax:
1-800-772-9985
(716) 8792040