

ENGINEERING LETTER A-220
APPLICATION OF ALKAGEN®-AQ SOLUTION FOR ODOR AND CORROSION CONTROL

Introduction

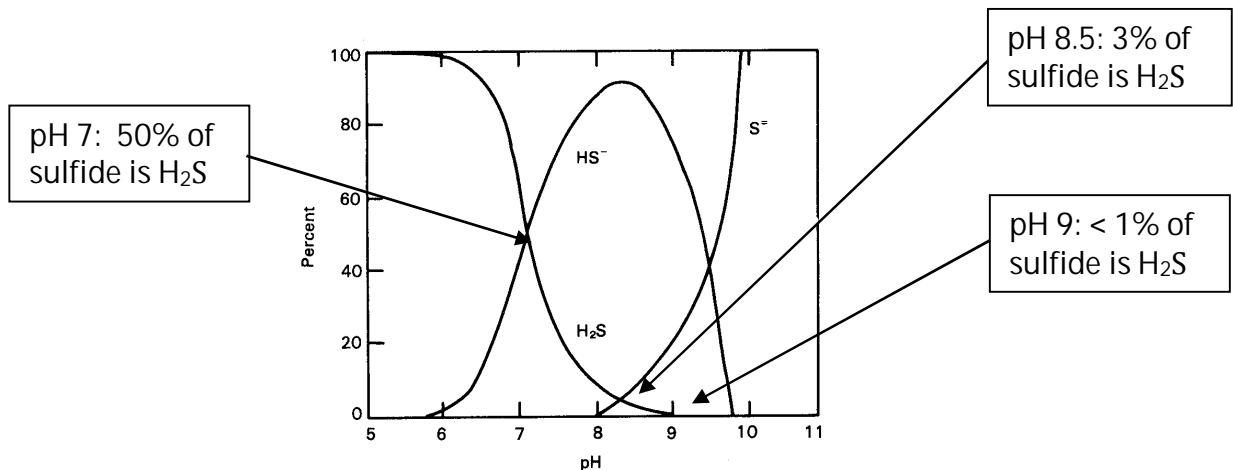
Almost all wastewater collection system odor and corrosion problems are a result of the formation of sulfide. Sulfide is formed under the anaerobic conditions that typically exist in wastewater force mains. When wastewater is released from force mains into gravity systems, pump stations, or treatment plants, sulfide is released as hydrogen sulfide gas, which has a rotten egg odor that can be detected by the human nose at concentrations of less than 1 ppm. In addition, hydrogen sulfide is readily converted by naturally occurring bacteria to sulfuric acid, which is very corrosive and is the cause of many infrastructure failures in wastewater systems.

Alkagen®-AQ Solution is a process for control of atmospheric and dissolved sulfide in wastewater conveyance and treatment systems. Alkagen®-AQ Solution is an Earth-friendly blend of a non-hazardous alkaline material and a non-hazardous metabolic modifier. Alkagen®-AQ Solution works via two mechanisms – alkalinity supplementation and metabolic modification. A description of each process follows:

Process Description

Alkalinity Supplement

Hydrogen sulfide (H₂S) is a partially soluble gas which exists in aqueous solutions (i.e., wastewater) in equilibrium with the hydrosulfide ion (HS⁻) and sulfide ion (S⁼). At neutral pH of 7.0, roughly 50% of the sulfide in solution will be in the H₂S form, which means it can be released to the atmosphere to cause odor and corrosion problems. At pH 9.0 less than 1% of sulfide is in the H₂S form. This relationship is shown on the following graph:



Alkagen®-AQ Solution contains a non-hazardous alkalinity supplement which is used to increase the pH of wastewater to 9.0, or whatever pH value is deemed necessary to control release of hydrogen sulfide in an individual system. Evoqua's VersaDose® Dose-to Demand technology is used to carefully control the metering of Alkagen®-AQ Solution into the system to maintain the pH level necessary for odor and corrosion control and to prevent over-feeding and wasting of product and money.

In addition to the odor and corrosion control benefits of alkalinity supplementation, Alkagen®-AQ Solution provides needed alkalinity for treatment processes and helps solubilize fats, oils, and grease in the systems where it is applied.

Metabolic Modification

Sulfide is produced in wastewater systems by sulfate reducing bacteria, or "SRBs". These SRBs thrive in the anaerobic conditions which exist in the slime layers of wastewater force mains. Alkagen®-AQ Solution contains a proprietary metabolic modifier which, when applied to the force main slime layer, blocks the cytochrome C3 site within the cell wall of SRBs and thereby prevents sulfate reduction. Thus, Alkagen®-AQ Solution not only prevents the release of H₂S produced upstream of the application point, but it also prevents formation of sulfide in the downstream force main. This reduces the dissolved sulfide load on any downstream stations and the treatment facility.

Summary

Evoqua's Alkagen®-AQ Solution is a non-hazardous blend of alkaline enhancement and dissolved sulfide prevention technologies that will cost effectively control odors and corrosion in your system. Alkagen®-AQ Solution will reduce the impact of FOG in collection and treatment systems, and will reduce the dissolved sulfide load on treatment plants. Alkagen®-AQ Solution has significant operational and costs advantages over other alkaline enhancement products.

For a free analysis and review of your collection system followed by a treatment recommendation, consumption rate prediction, and no-risk product demonstration, please contact the Evoqua Water Technologies Municipal Services Representative in your area or call our main office at 1-800-345-3982.

Alkagen®-AQ Solution is a proprietary technology of Evoqua Water Technologies. Evoqua Water Technologies is the sole provider of this product and technology. Purchase of Alkagen®-AQ Solution allows the purchaser a license to practice the technologies as described in US Patent Nos: 5,385,842, 5,500,368, and other patents pending.