

FACT SHEET: HYDROGEN SULFIDE IN DRINKING WATER



Water containing hydrogen sulfide usually does not pose a health risk, but does give water a nuisance "rotten egg" smell and taste. Water supplies with as little as 1 ppm (part per million) hydrogen sulfide are corrosive and may tarnish copper and silverware. Hydrogen sulfide also can cause yellow or black stains on kitchen and bathroom fixtures.

Sources of Hydrogen Sulfide in drinking water

Hydrogen sulfide gas is formed by sulfur bacteria that may occur naturally in water. These bacteria use the sulfur in decaying plants, rocks, or soil as their food or energy source and as a by-product produce hydrogen sulfide. The sulfur bacteria do not cause disease, but their presence in water can cause an offensive "rotten egg" or "sulfur water" odor and taste. In some cases, the odor may be noticeable only when the water is initially turned on or when the hot water is run.

When the odor is only present in hot water, the water heater may be the source of hydrogen sulfide. A magnesium rod is often placed in the tank by the manufacturer to prevent water heater corrosion. Sulfur that is dissolved in water can react with the magnesium rod forming hydrogen sulfide. The magnesium rod can be replaced with an aluminum one or removed completely. Removal however, may void the company's warranty.

Treatment options

Hydrogen sulfide formation may be reduced in some instances. Performing a shock chlorination procedure may reduce, but does not eliminate, the sulfide producing bacteria. To remove low levels of hydrogen sulfide, an activated carbon filter can be installed. The filter must be replaced periodically to maintain performance. Frequency of replacement will depend on daily water use and the concentration of hydrogen sulfide in the water.

Hydrogen sulfide concentrations up to about 6 ppm can also be removed using an oxidizing filter (same as an iron filter). This filter contains sand with a manganese dioxide coating that changes hydrogen sulfide gas to tiny particles of sulfur that are trapped inside the filter. The sand filter must be back flushed regularly and treated with potassium permanganate to maintain the coating.

Hydrogen sulfide concentrations exceeding 6 ppm can be removed by injecting an oxidizing chemical such as household bleach or potassium permanganate and using a filter. The oxidizing chemical should enter the water upstream from the storage or mixing tank to provide at least 20 minutes of contact time between the chemical and water. Sulfur particles can then be removed using a sediment filter. Excess chlorine can be removed by activated carbon filtration. When potassium permanganate is used a manganese greensand filter is recommended.

Often the treatment for hydrogen sulfide is the same as for iron and manganese, allowing removal of all three contaminants in one process. For additional information on specific treatment systems, please contact a professional water treatment company.