



External Heavy Metals/Sulfur/Iron Reduction Cartridge

Intended for use outside of your AlkaViva water ionizer.

Hydrogen Sulfide

As a chemical compound, H₂S, is a colorless gas that has a very disagreeable odor, much like that of rotten eggs and slightly soluble in water. Dissolved in water, it forms a very weak dibasic acid that is sometimes called hydrosulfuric acid.

Hydrogen sulfide is flammable; in an excess of air it burns to form sulfur dioxide and water, but if not enough oxygen is present - it forms elemental sulfur and water.

Hydrogen sulfide is found naturally in volcanic gases and in some mineral waters. It is often formed during decay of animal matter. It is a part of many unrefined carbonaceous fuels, e.g., natural gas, crude oil, and coal; it is obtained as a byproduct of refining such fuels. It may be made by reacting hydrogen gas with molten sulfur or with sulfur vapors, or by treating a metal sulfide (e.g., ferrous sulfide, FeS) with an acid. Hydrogen sulfide reacts with most metal ions to form sulfides; the sulfides of some metals are insoluble in water and have characteristic colors that help to identify the metal during chemical analysis.

How is it used?

Natural gas contains up to several percent H₂S(g) and as such are called sour gas wells from their offensive stench. Volcanoes also discharge hydrogen sulfide. Anaerobic decay aided by bacteria produces hydrogen sulfide, which in turn, produces sulfur. This process accounts for much of the native sulfur found in nature. Commercially hydrogen sulfide is obtained from "sour gas" natural gas wells. Hydrogen sulfide has few important commercial uses. However, exposure route often not covered by regulation, especially rural drinking water supplies from groundwater. Hydrogen sulfide gas also occurs naturally in some groundwater. It is it is used to produce sulfur which is one of the most commercially important elements. Exposure in a residential setting can come from nearby industrial and agricultural sources, oil and gas development, and wastewater treatment plants, all generally regulated sources. However, exposure to hydrogen sulfide from contaminated drinking water is an formed from decomposing underground deposits of organic matter such as decaying plant material. It is found in deep or shallow wells and also can enter surface water through springs, although it quickly escapes to the atmosphere. Hydrogen sulfide often is present in wells drilled in shale or sandstone, or near coal or peat deposits.

What are the health effects?

Immediate symptoms from the gas may include dizziness and an upset stomach; lengthy exposure may lead to loss of consciousness and/or death.

Is there any harm from drinking and bathing in contaminated water?

Although many impurities are regulated by Primary or Secondary Drinking Water Standards set by the EPA, hydrogen sulfide is not regulated. A concentration high enough to be a drinking water health hazard also makes the water unpalatable.

The odor of water with as little as 0.5 ppm of hydrogen sulfide concentration is detectable by most people. Concentrations less than 1 ppm give the water a "musty" or "swampy" odor. A 1-2 ppm hydrogen sulfide concentration gives water a "rotten egg" odor and makes the water very corrosive to plumbing.

Iron

Iron is one of the earth's most plentiful resources, making up at least five percent of the earth's crust. Rainfall seeping through the soil dissolves iron in the earth's surface and carries it into almost every kind of natural water supply, including well water.

Iron is generally divided into two main categories:

1) Soluble or "Clear water" Iron

This is the most common form and the one that creates the most complaints by water users. This type of iron is identified after you've poured a glass, of cold clear water. If allowed to stand for a few minutes, reddish brown particles will appear in the glass and eventually settle to the bottom.

2) Insoluble Iron

When insoluble iron, or "red water" iron is poured into a glass, it appears rusty or has a red or yellow color. Although less common in water wells, insoluble iron can create serious taste and appearance problems for the water user.

Because iron combines with different naturally occurring acids, it may also exist as an organic complex. A combination of acid and iron, or organic iron, can be found in shallow wells and surface water. Although this kind of iron can be colorless, it is usually yellow or brown.

Finally, when iron exists along with certain kinds of bacteria, problems can become even worse. Iron bacteria consume iron to survive and leave a reddish brown or yellow slime that can clog plumbing and cause an offensive odor. You may notice this slime or sludge in your toilet tank when you remove the lid.

What are the effects?

Health

Iron is not hazardous to health, but it is considered a secondary or aesthetic contaminant. Essential for good health, iron helps transport oxygen in the blood. Most tap water in the United States supplies approximately 5 percent of the dietary requirement for iron. The maximum contaminant level for Iron is .3 milligram per liter.

Taste and Food

Dissolved ferrous iron gives water a disagreeable taste. When the iron combines with tea, coffee and other beverages, it produces an inky, black appearance and a harsh, unacceptable taste. Vegetables cooked in water containing excessive iron turn dark and look unappealing.

Stains and Deposits

Concentrations of iron as low as 0.3 mg/l will leave reddish brown stains on fixtures, tableware and laundry that are very hard to remove. When these deposits break loose from water piping, rusty water will flow through the faucet.

How do I remove Hydrogen Sulfide and Iron from my drinking water?

AlkaViva is using a compound called KDF that has long been used in water treatment industry for the removal of Iron, Manganese, and Hydrogen Sulfides. This filter removes Heavy Metals and also utilizes carbon for the reduction of Chlorine, Taste, and Odor. This filter is intended for use outside of your AlkaViva water machine.