

Hydrogen Sulfide

The presence of hydrogen sulfide in water as low as 0.5 part per million can lend an offensive “rotten egg” odor to the water. Hydrogen sulfide can make water taste and smell bad, and can also corrode iron, steel, copper, and copper alloy. It occurs from the leaching of sulfide bearing minerals in the earth. Concentrations of between 5 to 10 parts per million are not unusual, and there are reports of some ground waters having as much as 70 parts per million. Near total removal is necessary to eliminate the associated problems.

Aeration at neutral pH can drop the H₂S levels down to 1 to 2 parts per million. Aeration with chlorination can achieve total removal, but since free sulfur is formed during the steps, it may be necessary to provide coagulation and/or filtration. The elemental sulfur produced by aeration is a colloidal, sticky material that is not easily removed from the water.

A simple and inexpensive method of removing H₂S can be achieved by using ResinTech SBG2, a Type 2 anion resin, regenerated with either sodium chloride or sodium bicarbonate, or a mixture of the two. The pH of the water to be treated has an impact on the removal efficiency. For water with a pH higher than 8.0, sodium chloride should be used alone as the regenerant. For a pH between 7 and 8, a solution of 90% sodium chloride and 10% sodium bicarbonate works best; and in waters with a pH of less than 7.0, regeneration with sodium bicarbonate alone should give good results. It is also recommended that countercurrent regeneration techniques be used to insure complete removal of hydrogen sulfide throughout the run.

The resin is normally regenerated based on exhaustion with sulfate. This capacity is approximately 12 kilograins per cubic foot for ResinTech SBG2 regenerated at a 10 pounds per cubic foot dose rate.

It is important to minimize any chance of oxygenated water coming in contact with the exhausted resin as this can cause sulfur to precipitate and foul the resin. Feedwater should not be stored in any tank that is open to the atmosphere. The brine tank should be covered and the brine dilution water should be oxygen free.

It may be necessary to remove iron from the influent water on systems that are treating waters with a significant iron content. Without iron removal, some waters have the potential to precipitate iron sulfide on the resin, lowering the capacity and increasing the H₂S leakage. Waters that contain more than 1 ppm of iron should be treated with ResinTech CG8 softening resin to remove the iron. If the bed of ResinTech SBG2 does become iron fouled it can be cleaned with an acid solution.

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