FACT SHEET

Sulfate

What is it?

Sulfate is a sulfur-oxygen unit that combines with various organic and inorganic ions. Sulfate is the most common form of sulfur found in water. Compounds containing sulfate are used quite extensively especially sodium sulfate (salt cake), magnesium sulfate (Epsom salts) and calcium sulfate (gypsum). In the presence of sulfate reducing bacteria sulfate can be reduced to sulfide, which gives off the characteristic "rotten egg odor".

Are there other names for it?

Sulfate is sometimes called vitriol, SO_4, or the salt of sulfuric acid.

Where does it come from?

Most of the sulfate in water comes from dissolved minerals, namely sodium sulfate (salt cake), magnesium sulfate (Epsom salts) and calcium sulfate (gypsum). Sulfate can also come from fertilizer or sewage treatment.

Why should I be concerned about it?

The USEPA has set a secondary maximum contaminant level of 250 mg/L of sulfate in drinking water. The primary concern with sulfate is based on aesthetic affects. At levels above 250 mg/L sulfate may give the water a bitter or medicinal taste. Higher levels may cause diarrhea and possible dehydration for persons not accustomed to the sulfate. Adults and older children will become accustomed to high levels of sulfate after a few days and have no problems. Water containing high sulfate can be diluted with lower sulfate water to gradually get accustomed to the higher sulfate concentrations. Animals are also sensitive to sulfate in the water. At very high concentrations sulfate is toxic to cattle. Problems with sulfates are most often related to their ability to form strong acids which changes the pH.

It is not recommended to use high sulfate water in preparation of infant formula.

High levels of sulfate can also corrode copper pipes.

What effect will boiling have on it?

Sulfates do not evaporate. Boiling water will not remove the sulfates, but will concentrate them.

How do I remove it?

The most common methods of removal of sulfate from water are reverse osmosis and ion exchange. A water softener will not remove sulfate and will exchange the calcium and magnesium sulfate for sodium sulfate, which is a somewhat more potent laxative.