

Chlorides

Chlorides, not to be confused with chlorine, are in nearly all water supplies. They are usually associated with the salt content and the amount of dissolved minerals in water. The recommended limit for chlorides is 250 milligrams per liter (mg/l). This is the concentration in water where most people will notice a salty taste.

CAUSES:

Chlorides are soluble mineral compounds that are dissolved by the water as it filters through the earth. The amount of chlorides in water are determined by the type of rocks and soils it has contacted. In coastal areas, the leaking of sea water into a well can also be a cause of increased chlorides.

Water supplies having high concentrations of total dissolved solids (TDS) may also contain elevated chloride levels as part of the TDS. As much as 50 percent of the TDS may be due to chlorides.

Human and animal wastes contain a high concentration of chlorides. If a sudden, large increase in the chloride content is noticed, or if the well water begins to taste salty, then

samples should be taken to see if the well has been contaminated.

EFFECTS:

The presence of chlorides in drinking water is generally not considered to be harmful to humans or animals. The most noticeable effect of high chlorides is a salty taste. If a water softener is being used, the taste will be even more pronounced.

In mineralized waters (high TDS), chlorides contribute to the corrosion of household appliances and domestic plumbing by preventing the formation of protective oxide films on exposed surfaces. The average life of water heaters has been estimated to shorten by one year for every 100 mg/l chloride over the first 100 mg/l.

TREATMENT:

Chlorides cannot be easily removed from drinking water. Of the available treatment processes, reverse osmosis (RO) and deionization (DI) are capable of effectively treating the entire household supply. However, both are relatively expensive. Because deionized water can also be corrosive, DI units are not recommended for whole-house use.

If the taste of the water is the only concern, the treatment methods described below are available as point-of-use devices. A point-of-use device is a small treatment unit that will produce between 10 and 15 gallons of water per day for drinking and cooking. The device is usually located near the kitchen sink.

1. Reverse osmosis (RO): RO units remove dissolved minerals by forcing the water, under pressure, through a synthetic membrane. The membrane contains microscopic pores that will allow only molecules of a certain size to pass through. Since the molecules of dissolved mineral salts are large compared to the water molecules, the water will squeeze through the membrane leaving the mineral salts behind.

A properly operated RO unit is capable of removing 90 percent of the dissolved mineral salts from a water supply. A pre-filter is usually required to protect the membrane from abrasion. The membrane cartridges require periodic replacement.

2. Distillation: Distillation units are better known as “stills.” They are manufactured from heat-resistant glass or stainless steel. Stills work by heating small amounts (less than 2 gallons) of water to produce steam. The steam is then collected and condensed back into water. The dissolved minerals will not vaporize and are left behind in the heating chamber.

Stills require frequent, rigorous cleaning to remove the baked-on mineral salts. The “flat” taste from boiling the water can be reduced by pouring the water back and forth between two containers to aerate it.

3. Deionization (DI): Deionization units are available as small, wall-mounted cartridges containing ion exchange resins. When water passes through the cartridge the dissolved mineral salts are retained in the resin, producing a mineral-free water.

The DI cartridges have a limited life. They will usually show a color change in the resin to indicate when they should be replaced.

4. Combination Point-of-Use Devices: These are multistep treatment systems designed to fit under the kitchen sink. They use a pre-filter, RO membrane or DI cartridge, and a carbon polishing filter top and produce up to 15 gallons of water per day. The treated water is stored in a small pressure tank and piped to a special faucet on the sink. Each of the treatment steps is in a cartridge form.