

**Question: What is hard water?**

**Answer:** Hardness in drinking water is caused by two nontoxic chemicals (usually called minerals) calcium and magnesium. If calcium and/or magnesium is present in your water in substantial amounts, the water is said to be hard because making a lather or suds for washing is hard (difficult) to do. Thus, cleaning with hard water is hard / difficult. Water containing little calcium or magnesium is called soft water. (Maybe it should be called easy, the opposite of difficult.)

**Question: When I put cubes that I've made in my freezer into a glass of water, white stuff appears in glass as the ice cubes melt. What is the white stuff and where does it come from?**

**Answer:** Ice cubes freeze from the outside, so the center of the cube is the last to freeze. Ice is pure water, only H<sub>2</sub>O, so as the ice cube freezes, all of the dissolved minerals, like the hardness minerals are pushed to the center. Near the end of the freezing, there isn't much water left in the center of the cube, so these minerals become very concentrated, and they form the white stuff the technical name is precipitate. The hardness minerals that cause the white stuff are not toxic. Some commercial ice cubes are cored after they freeze to remove this material. Having posts in your ice cube tray doesn't help as the precipitate must actually be removed by coring.

**Question: Why does my dishwasher leave spots on my glasses?**

**Answer:** The spots that may appear on glassware after it is washed and air-dried are caused by nontoxic minerals that remain on the glass when the water evaporates. Commercial products are available that allow the water to drain from the glassware more completely.

**Question: Should I install a water softener in my home?**

**Answer:** If you are bothered by a sticky, gummy soap curd deposit in your bathtub or by the buildup of white deposits (called scale) on your cooking pots and coffee maker, a water softener can help with these problems. The higher the hardness number, the more a water softener will help. AWWA suggests that if it is more than 120 milligrams per liter, abbreviated mg/L sometimes called 120 parts per million or 7 grains per gallon-then you might consider a water softener to reduce the formation of scale in your hot water system and to make washing easier. The water from Silver Creek Water Corporation is about 11 grains per gallon hard. The water softener replaces the nontoxic "hardness" minerals with sodium or potassium. The amounts of these elements are relatively insignificant in comparison to what you get in food and should not be a problem, unless your doctor has put you on a special restricted diet. Whether to put the softener on your main water line or just the hot water line is a complicated issue. Softening only the hot water has some cost and environmental advantages related to regeneration, which is a process by the softening materials (called resins) inside the softener can be used over and over again. Water softeners are regenerated with salt. After the salt is used, it goes down the drain and into the environment-so the less salt used the better. Using less salt also saves you money. If you soften only the hot water, less water goes through the softener, so it needs regeneration less often, meaning less salt is being used. Also, regenerating a softener after a selected amount of water has gone through it rather than on a particular time schedule is better, as this prevents wasting salt by regenerating too soon or using the softener after it has stopped softening. Finally, some people think bathing in completely soft water (both hot and cold water - softened) is unpleasant-it feels like the soap won't rinse off. You may be surprised to learn however, that rinsing is actually more complete in soft water than in hard water. Although you can't see it, when you bathe or wash your hair in hard water, some of the same stuff that causes the bathtub ring gets on your body or in your hair. With soft water this material does not form, so rinsing is more complete. Softening only the hot water has two disadvantages. First, if you wash your clothes in cold water, you won't get the benefit of soft water, however you can buy products to add to your wash to help if this is a problem. Second and more important, if your water is very hard more than twice the numbers mentioned above, when you mix the hot and cold water together the water will still be hard and you won't see much benefit from the softener. Concern has been expressed by some whether the installation of a water softener may raise the lead and copper content of drinking water in homes that are experiencing problems. Probably not, but the US Environmental Protection Agency is conducting research to investigate these matters.

**Question: What is that white stuff in my coffee pot and on my showerhead and glass shower door? How can I get rid of it?**

**Answer:** Minerals dissolved in water tend to settle out when water is heated or are left behind when it evaporates. These minerals are white and accumulate in coffeepots and on showerheads and glass shower doors. To remove these minerals, fill the coffeepot with vinegar and let it sit overnight, or soak the showerhead overnight in a plastic bowl filled with vinegar. Slowly adding 1 tablespoon of muriatic acid to 1 quart of vinegar will help but is not necessary. Be careful not to spill this mixture. When you are done, carefully discard the contents of the plastic bowl down a drain, and flush the container and sink drain with plenty of water. NOTE: Rinse the coffeepot or showerhead thoroughly after treatment and before use. Pouring the excess hot liquid out of your coffeepot when you are finished with it will help somewhat in preventing this problem. White spots on glass shower doors are difficult to remove with vinegar because the spots dissolve very slowly. A better idea is to prevent the spots from forming by wiping the glass door with a damp sponge or towel after each shower. NOTE: Some commercial establishments use untreated water for irrigation to save on tap water. If this is groundwater, it may be high in minerals and if this water sprays onto your car, it can leave spots. Vinegar will remove them. Rinse with good water after using the vinegar.