

Tech Corner

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By Ken Woodson

Is water important in brewing? Considering the fact that beer is around 90% water, we cannot ignore the impact that water has on our brews. Conventional wisdom says, if you can drink the water, then it is probably OK to brew with it. However, there are certain aspects of water treatment you should know. Most municipal areas treat their water supply with chlorine to reduce bacterial growth. Chlorine can interact with wort to produce chlorophenols which can impart a plastic taste to beer. So, chlorine should be removed from your brewing water. To remove chlorine you can use a charcoal water filter.

The local water supply contains many ions of varying concentrations. Ions are electrically charged groups of atoms and come in two flavors, positively charged ions called cations and negatively charged ions called anions. If you could examine water at the atomic level, you would see H₂O molecules and some disassociated hydrogen H⁺ ions and hydroxide (OH⁻) ions. The pH, or potential hydrogen, is a measure of the relative concentrations of these two ions. For pure water, the two ions have equal concentrations, which translate to a pH of 7. Solutions with a higher concentration of H⁺, have a pH less than 7 and are acidic, while solutions with a higher concentration of (OH⁻) have a pH greater than 7 and are basic. pH is important in brewing because enzymes that break down starches during mashing work best over a pH range of 5.2 – 5.5. Also, during sparging if the pH rises above 6.0 then tannins can leak into the wort and cause harsh flavors in beer.

Typically, the local treated water supply has a pH around 8.0. So, to achieve the correct pH during mashing or sparging the brewing water pH should be reduced. This reduction can be achieved naturally through the interaction of dark malts with your local water or you can directly alter the pH of your brewing water by adding very small amounts of mineral salts or food grade acid.

For brewing, the most important cation is Calcium (Ca⁺²). Calcium can lower pH in the mash and during wort boiling by combining with malt phosphates. Also, Calcium helps protein coagulation during the hot and cold breaks. Bicarbonate (HCO₃⁻) is the most important anion for brewing. Bicarbonate neutralizes acids in dark malts, and it acts as a pH buffer in the mash.

As a final note, you can treat your local water with mineral salts to closely replicate the water used in famous brewing cities. For example, Burton upon Trent is famous for pale ales. The high sulfate level of the water at Burton accents the hop bitterness. If you are considering the addition of mineral salts to your water supply, you should ask your water supplier for an analysis of the minerals in the water. Many suburbs around Dallas receive their water supply from the North Texas Municipal Water District. Their website contains a monthly analysis of their water, see www.ntmwd.com/WaterQuality.html.

If you would like to read more about water treatment, *New Brewing Lager Beer*, by Gregory J. Noonan, is another good source.