

What is alkalinity?

Alkalinity is a measure of water's capacity to resist a decrease in pH. In natural waters alkalinity is primarily a function of the **carbonate system**, which comes from rocks containing calcium carbonate. These rocks dissolve on contact with water and release calcium ions (Ca^{+2}), carbonate ions (CO_3^{-2}), bicarbonate ions (HCO_3^-), or carbonic acid (H_2CO_3), depending on the water's pH. The negative carbonate and bicarbonate ions combine with positive hydrogen ions (H^+) reducing acidity and increasing pH. Different types of carbonate dominate at different pH levels.

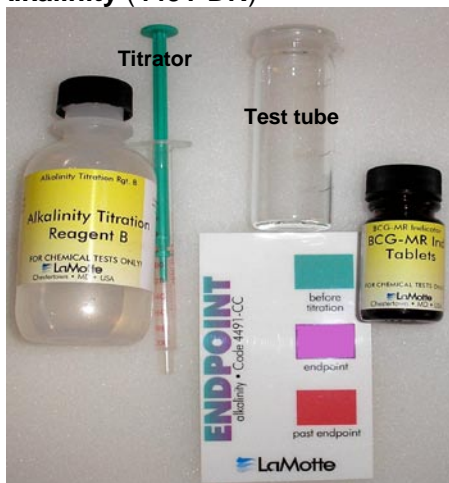
The sources of the carbonate minerals are found in some types of sedimentary rocks. Limestone yields calcium carbonate and dolostone yields calcium or magnesium carbonate. In areas where granite or other igneous rocks dominate the geology, waters have little natural alkalinity. Green plants also influence the carbonate system. During **photosynthesis**, plants consume CO_2 , which would otherwise form carbonic acid when dissolved in water. Thus, plants are the primary buffering system in areas with little geologic potential.

pH > 10: Carbonate (CO_3^{-2})

pH 6–10: Bicarbonate (HCO_3^-)

pH < 6: Carbonic acid (H_2CO_3)

Alkalinity (4491-DR)



1. Collect your water sample using a clean plastic sample bottle then transfer the sample to the test tube.
2. Clean the test tube by rinsing with sample water or distilled water (3-times), then fill with sample water to the 5-ml line.
3. Add one BCG-MR Tablet, cap and mix until the tablet disintegrates. A blue-green color will develop.
4. Fill the Direct Reading Titrator with Titration Reagent B by pushing the titrator into the hole in the top of the reagent, and then turning the titrator and reagent upside down and pulling the liquid to the zero-line.
5. Add the titration solution to the sample very slowly drop-by-drop, swirling between each drop until the solution turns purple (consult the chart for exact colors).
6. Read the scale and record your result as ppm (CaCO_3); each minor division on the scale is equivalent to 4-units.