Technical Data Sheet

Total Alkalinity

Method: Acid Titrant with pH Indicator

Applications and Industries: Drinking, surface and saline waters, domestic and industrial wastewaters, boiler and cooling waters

References: APHA Standard Methods, 21st ed., Method 2320 B (2005); ASTM D 1067-02, Acidity or Alkalinity of Water, Test Method B; USEPA Methods for Chemical Analysis of Water and Wastes, method 310.1 (1983)

Chemistry: Total or "M" alkalinity is determined using a hydrochloric acid titrant and a bromocresol green/methyl red indicator. The end point of the titration occurs at pH 4.5. Results are expressed in ppm (mg/L) calcium carbonate ($CaCO_3$).

Interference Information: Alkalinity of a water is its acid-neutralizing capacity and is the sum of all titratable bases. Because the alkalinity of many surface waters is primarily a function of carbonate, bicarbonate, and hydroxide content, total alkalinity results are typically assumed to be an indication of the combined concentration of these constituents. However, test results may also include contributions from borate, phosphates, silicates or other bases if present.

Samples should be analyzed as soon as practical after collection in order to prevent prolonged exposure to air. Filtering, diluting, or otherwise manipulating the sample may cause erroneous results. Sample color or turbidity or the formation of a precipitate during titration may mask the end point color change. Oxidizing or reducing agents may interfere by destroying the indicator.

Interpretation of Results: At the endpoint of this titration, the color of the solution in the test ampoule changes from pink to bright green. If the ampoule is filled with sample but the color of the solution remains pink (i.e. does not change to green), the total alkalinity of the sample is below the test range. If the solution in the ampoule changes to bright green immediately upon introduction of the first small dose of sample, the total alkalinity of the sample is above the test range. If the sample itself turns pink or red immediately upon addition of the indicator (activator) solution (prior to introduction of the sample into the test ampoule), the sample pH is less than or equal to 4.5, which indicates that the alkalinity of the sample is 0 ppm.

Safety Information: Material Safety Data Sheets (MSDSs) are included with the test kits and are available upon request and on our website. Read MSDS before using these kits. Breaking the tip of an ampoule in air rather than water may cause the glass ampoule to shatter. Wear eye protection.

Available Analysis Systems: Titrimetric: Titrets®

Storage Requirements: Kits should be stored in the dark and at room temperature when not in use.

Shelf Life: The total alkalinity Titrets kits have shelf lives of 2 years.

Accuracy: Due to the non-linear nature of the test scale, the accuracy of these tests varies with the location of the test result on the ampoule scale. At twice the minimum concentration for a particular kit range, the accuracy is ± 10% error.

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