ALKALINITY AS CARBONATE IN WATER, WASTEWATER, & SOIL EXTRACTS

1. **Principle of Method:** Total alkalinity is determined by titration of the sample with standardized HCl using Bromocresol Green-Methyl Red (equivalence point pH 4.5) or methyl orange (equivalence point pH 3.7) as an indicator. If present, phenolphthalein alkalinity is determined as well (equivalence point pH 8.3). Total alkalinity results are reported as HCO_3^- mg/L equivalents. A calculation is done to convert to total alkalinity as $CaCO_3$ equivalents, if desired.

2. **Instrumentation Used:**

   Schott Instruments Titronic Universal automatic titrator.

3. **References:**

   3.1 APHA. Method "2320 – Alkalinity" rev **2011,** in *Standard methods for the examination of water and wastewater, 23rd ed*. American Public Health Association, Washington, DC, **2017.** (EPA approved method).

4. **Standards Used:**

   1. **Stock Standard Solution:** Dissolve 1.060g of anhydrous sodium carbonate, Na_2CO_3 (CASRN 497-19-8) that has been oven-dried, at 250°C for 4 hours, in **carbon dioxide free** reagent water and dilute to 1000 mL. (1.00 mL = 1.00 mg $CaCO_3$ equivalents).

   2. **Hydrochloric Acid:** Dilute trace-metal grade HCl in ultra-pure water to a final concentration of approximately 0.02 M. Standardize using the Na_2CO_3 solution prepared above.