# Method Abstract #72
## Alkalinity

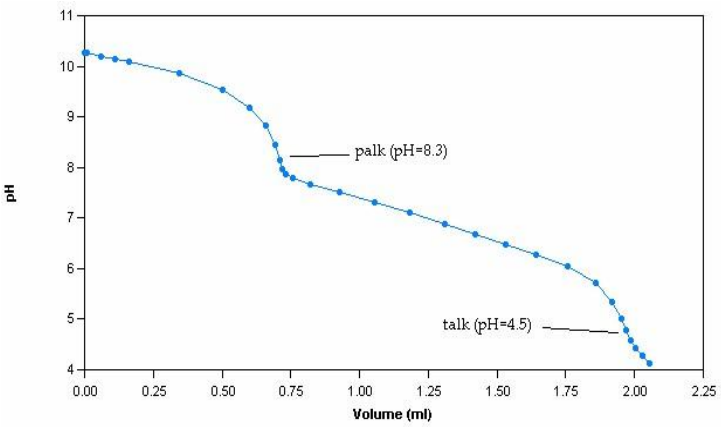
**Scope and Application**

This alkalinity method conforms to Standard Methods 24th Edition 2320 B, ASTM D 1067, EPA 310.1 and both ISO 9963-1 and 9963-2. It determines the total and phenolphthalein alkalinity of aqueous samples, along with measuring the concentrations of carbonate, bicarbonate, and hydroxide. Gran alkalinity can also be determined simultaneously.

**Method Summary**

Alkalinity analysis involves the titration of samples with standard 0.02N sulphuric acid ($H_2SO_4$) titrant to endpoints of pH 8.3 and 4.5. For alkalinities less than 20 mg $CaCO_3$/L, an additional endpoint at pH 4.2 is recorded. 0.02N hydrochloric acid (HCl) titrant may also be used

**Sample Titration Curve**




**Method Performance**

| Parameter | Specification |
|---|---|
| Measuring Range* | 0.1 – 2500*** ppm |
| MDL** | 0.1ppm |
| RSD @ 0.3ppm | 24.58% or +/- 0.07ppm |
| RSD @ 1ppm | 6.49% or +/- 0.06ppm |
| RSD @ 10ppm | 0.96% or +/- 0.10ppm |
| RSD @ 200ppm | 0.48% or +/- 0.96ppm |

**Example Speciation of Alkalinity**

| pH | Total Alkalinity | p-Alkalinity | Bicarbonate | Carbonate | Hydroxide |
|---|---|---|---|---|---|
| 8.794 | 265.00ppm | 22.06ppm | 220.89ppm | 44.11ppm | 0.00ppm |

*Data for this measuring range was obtained using laboratory prepared standards formulated from sodium carbonate. The measuring range may be increased by using larger capacity analysis vessels and/or auto-dilution.

**The Method Detection Limit (MDL) was determined based on data obtaining a coefficient of variance better than 30%. Results may differ depending on laboratory practices and sample matrix

***Note: This upper limit is not determined by chemistry, but rather by the vessel size and volume of sample. The upper limit can be extended to 25,000+ mg/L through the use of automatic dilutions, which are a standard feature of the MANTECH Titrasip and MT100 system requiring no additional hardware.

RSD values are better than those specified in Standard Methods.