



Detail of the components of the alkalinity measurement system

## Alkalinity titrator

**1** Brand **Metrohm** Model **855 Robotic Titrosampler**

### Technical specifications

- Automatic titrator with capacity for 57 samples.
- Quantification range between 10 and 10000 mg CaCO<sub>3</sub>/L.
- The components necessary for its correct use are:
  - > 807 dosing unit and 800 Dosino: 20 mL automatic burette with a 2 μL resolution.
  - > 802 rod stirrer: stirring from 0 to 2250 rev/min.
  - > pH glass electrode: measurement range from 0 to 14 (resolution 0.001).
  - > 856 Conductivity module and 5-ring conductivity cell: Measurement range from 5 to 20000 μS/cm (resolution 0.1 μS/cm).

### Technique description

The alkalinity of water is its acid-neutralizing capacity. It is the sum of all the titratable bases.

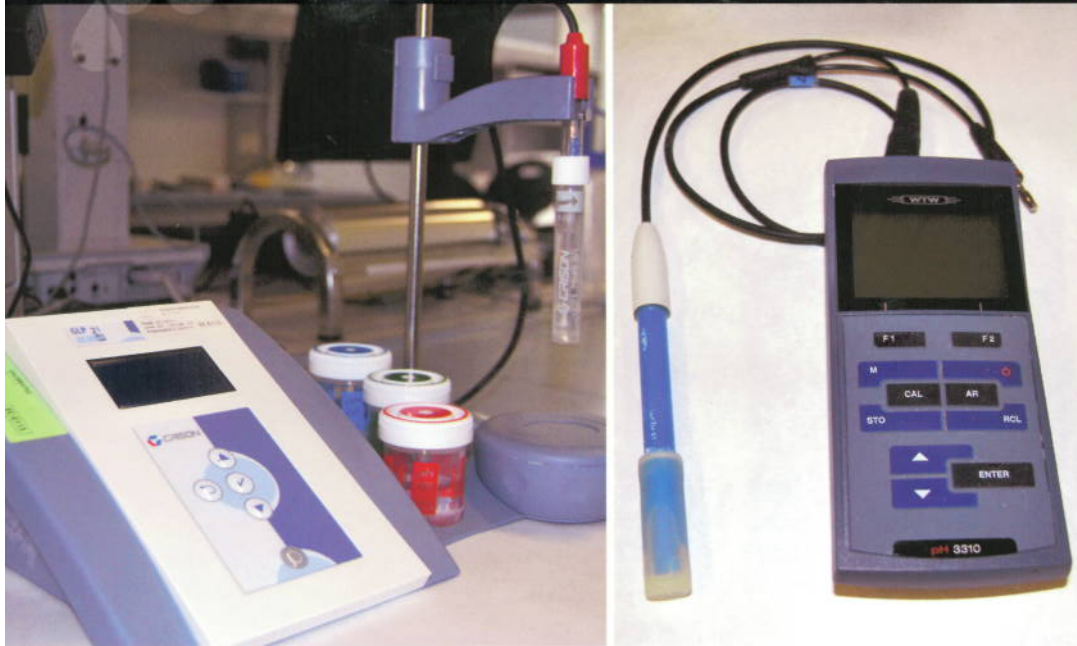
The alkalinity of many surface waters is primarily a function of its carbonate, bicarbonate and hydroxide content, for this reason the concentration of these constituents is used as an indicator. Bicarbonate is the chemical form that most contributes to alkalinity.

The determination of the alkalinity is performed through the titration of the water sample with a strong acid such as hydrogen chloride (HCl). Two alkalinity values are defined:

- > *Alkaline value* (phenolphthalein alkalinity), T<sub>A</sub>, measuring the amount of free alkali and carbonates in the water, corresponding to the titration with acid until a pH where the bicarbonate is the predominant specie (pH = **8.3**).
- > *Total alkaline value* (or total alkalinity), T<sub>AC</sub>, measuring the amount of free alkalis, carbonates and bicarbonates contained in the water, corresponding to the titration with acid until carbonate species are transformed to CO<sub>2</sub> (pH = **4.5**).

### Applications

- > Evaluation of the buffer capacity of water.
- > Quality control. Usually, the alkalinity value must be known in order to calculate the amount of chemical products that must be added to water for its treatment.
- > Indicator of possible discharges.



Benchtop and portable pH meter

## Benchtop and portable pH meter

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pHmetre  
Benchtop  
Portable

Brand  
**Crison**  
**WTW**

Model  
**GLP 21**  
**pH 3310**

### Technical specifications

- pH measurement by stability or continuous (portable pH meter also measures at regular intervals).
- pH range from 0 to 14.
- pH glass electrode with a temperature sensor incorporated.

### Technique description

pH is the measurement of acids or bases present in an aqueous medium. In diluted solutions, pH is calculated from the proton concentration.

Among the different procedures for pH measurement, potentiometric is the most common. It involves the use of a glass indicator electrode and a reference electrode. The instrument measures the potential difference produced through the thin glass membrane of the indicator electrode which separates two solutions with different proton concentration.

### Applications

- > pH measurement is related to water quality control. The Spanish technical health regulation states that the pH of drinking water should be between 7 and 8 as a guide value and between 6.5 and 9.2 as minimum and maximum tolerable value.
- > Determination of the effectiveness of water treatment processes (for instance, coagulation, flocculation and precipitation).
- > Detection of contamination. Although all waters show certain alkalinity, it is not usual to find acid waters, except in high contamination cases.
- > Portable pH meters can also be used for measurements on-line and pH control in both industrial processes and readings in the field.