NaOH & Carbonates

Method - Colorimetric

After adding the sample into the measurement cell, specific pH indicators are added sequentially to condition the solution for selective neutralization of alkaline species. The first indicator allows detection of hydroxide neutralization, while the second indicator enables detection of bicarbonate and carbonate neutralization. A blank correction is applied to compensate for any optical disturbances. The sample is then titrated with a standard acid solution under controlled stirring conditions. The color changes occurring at each equivalence point are monitored photometrically at the appropriate wavelength.

Principle of measurement

The method determines the concentration of sodium hydroxide (NaOH), bicarbonates (HCO3-) and carbonates (CO32-) by neutralization with a standardized hydrochloric acid solution. Phenolphthalein indicates the endpoint for hydroxide neutralization by changing from pink to colorless. Methyl orange indicates the complete neutralization of bicarbonates and carbonates by changing from yellow to red. The volume of titrant consumed at each endpoint are used to determine the concentrations of sodium hydroxide and carbonate with high accuracy and repeatability.

Advantages of the method

The use of two indicators enables the selective and simultaneous determination of hydroxide and carbonates in the same sample. Phenolphthalein measures NaOH, while methyl orange determines total carbonates through two clear endpoints. The method is simple, fast, reliable, low-cost, and widely used for routine laboratory analysis and industrial process control.

Specifications

Range: From 0 to 100 ppm / 200 ppm / 300 ppm. Adjustable higher concentrations with internal dilution.
Resolution: 2%
Repeatability: 2%
Analysis time: around 20 minutes
Calibration: one point
LED Wavelength: 535 nm

Reagents consumption

- Reagent 1: 0.1 ml / analysis — 0.1 L / month
- Reagent 2: 0.4 ml / analysis — 0.3 L / month
- Titrant: 5.5 ml / analysis — 4 L / month

Monthly consumption calculated assuming 1 analysis per hour.

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