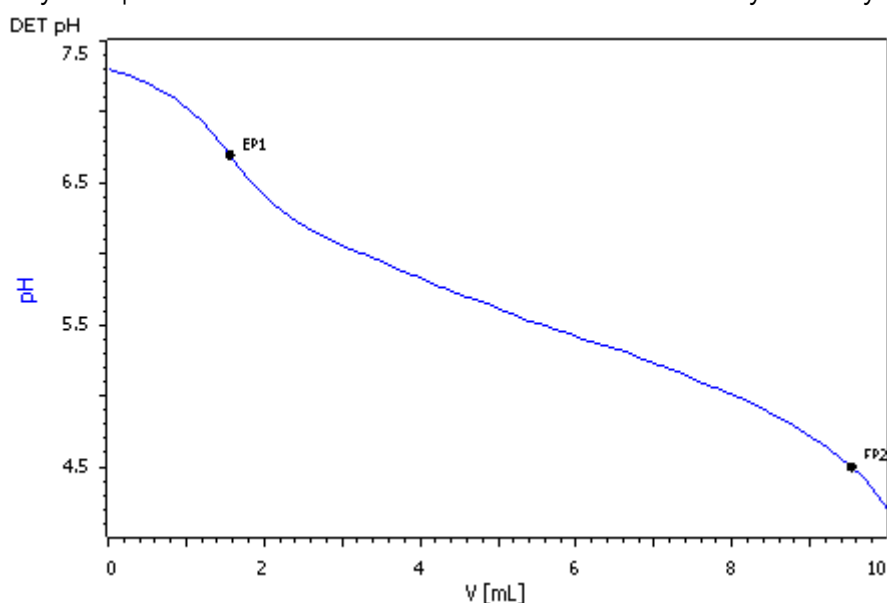


Titration Application Note T-172

Determination of the alkalinity in brackish water, seawater, and brines according to ASTM D3875

Alkalinity is a powerful means to characterize a water body's ability to neutralize



acidic pollution and thereby monitor the impact of human disturbances.

This Application Note describes the determination of the alkalinity in seawater, brackish water, and brines by automated, potentiometric titration using hydrochloric acid as titrant according to ASTM D3875.

Method description

Sample

Seawater, brackish water and brine

Sample preparation

No sample preparation is required.

Configuration

| | |
|---|------------|
| 905 Titrand | 2.905.0010 |
| 800 Dosino | 2.800.0010 |
| 814 USB Sample Processor (1T/1P) | 2.814.0010 |
| 772 Pump Unit | 2.772.0110 |
| Dosing unit 10 mL | 6.3032.210 |
| 802 Rod stirrer | 2.802.0020 |
| Stirring propeller | 6.1909.050 |
| Sample rack, 16 x 150 mL | 6.2041.320 |
| Titration head, 6x NS 14 and 3x NS 9 openings | 6.1458.010 |
| Sample beakers, glass, 16 x 150 mL | - |
| Unitrode with Pt 1000 | 6.0258.600 |
| Electrode cable for plug in head U/plug F, 2x2 mm B, 1m | 6.2104.600 |

Solutions

| | |
|---------|--|
| Titrand | Hydrochloride acid, c(HCl) = 0.1 mol/L |
|---------|--|

Analysis

Approx. 80 mL sample is pipetted into a titration beaker and placed on the rack. The solution is titrated with c(HCl) = 0.1 mol/L to a pH-value of 3.0 using the Unitrode. Two fixed endpoints at pH = 8.1 and pH = 4.5 are evaluated and used for the calculation.

Parameters

| | |
|---------------------|-----------|
| Mode | DET U |
| Stirring rate | 10 |
| Signal drift | 50 mV/min |
| Min. waiting time | 0 s |
| Max. waiting time | 26 s |
| Meas. point density | 4 |
| Dosing rate | Maximum |
| Min. increment | 10 µL |
| Max. increment | off |
| EP criterion | 5 |
| EP recognition | All |
| Stop volume | 5 mL |
| Stop pH | 3.0 |
| Fixed endpoint 1 | pH = 8.1 |
| Fixed endpoint 2 | pH = 4.5 |

Results

| Sample | Alkalinity | | | |
|----------------|--------------------------------------|------------|--------------------------------------|------------|
| | HCO ₃ ⁻ / mg/L | s(rel) / % | CO ₃ ²⁻ / mg/L | s(rel) / % |
| Seawater | 136 | 0.2 | 2.4 | 5.7 |
| Brackish water | 8.5 | 0.8 | 0 | - |
| Brine | 743 | 0.1 | 0 | - |