

Alkalinity, Total

DOC316.53.01257

Colorimetric Method**Method 10239****25 to 400 mg/L CaCO₃****TNTplus™ 870****Scope and application:** For drinking water, wastewater and boiler water.

Test preparation

Instrument-specific information

Table 1 shows all of the instruments that have the program for this test. The table also shows the adapter and light shield requirements for the applicable instruments that can use TNTplus vials.

To use the table, select an instrument, then read across to find the applicable information for this test.

Table 1 Instrument-specific information for TNTplus vials

Instrument	Adapters	Light shield
DR 6000, DR 5000	—	—
DR 3900	—	LZV849
DR 3800, DR 2800	—	LZV646
DR 1900	9609900 or 9609800 (A)	—

Before starting

DR 3900, DR 3800, DR 2800: Install the light shield in Cell Compartment #2 before this test is started.

Review the safety information and the expiration date on the package.

The recommended temperature for samples and reagents is 15–25 °C (59–77 °F).

The recommended temperature for reagent storage is 15–25 °C (59–77 °F).

DR 1900: Go to All Programs>LCK or TNTplus Methods>Options to select the TNTplus number for the test. Other instruments automatically select the method from the barcode on the vial.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

Items to collect

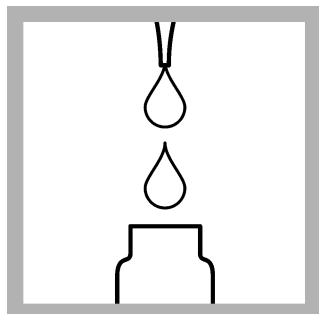
Description	Quantity
Total Alkalinity TNT870 Reagent Set	1
Pipet, adjustable volume, 1.0–5.0 mL	1
Pipet, adjustable volume, 0.2–1.0 mL	1
Pipet tips	1

Refer to [Consumables and replacement items](#) on page 3 for order information.

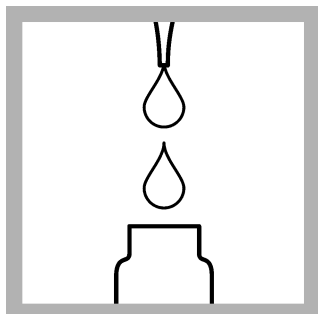
Sample collection

- Collect samples in clean glass or plastic bottles with tight-fitting caps. Completely fill the bottle and immediately tighten the cap.
- Prevent agitation of the sample or exposure to air.
- Analyze the samples as soon as possible for best results.
- If immediate analysis is not possible, keep the samples at or below 6 °C (43 °F) for a maximum of 24 hours.
- Let the sample temperature increase to room temperature before analysis.

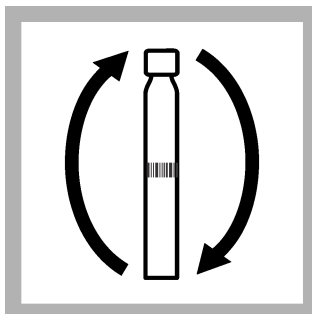
Test procedure



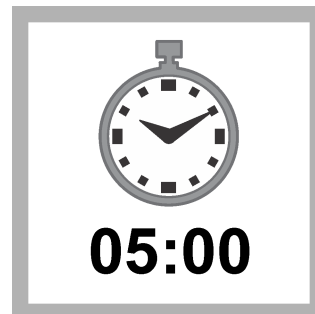
1. Use a pipet to add 2.0 mL of Solution A to the test vial.



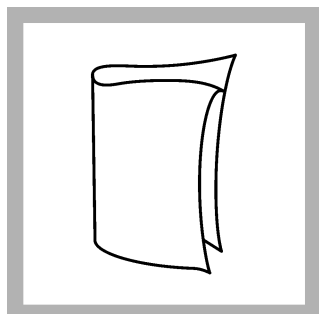
2. Use a pipet to add 0.5 mL of sample to the test vial.



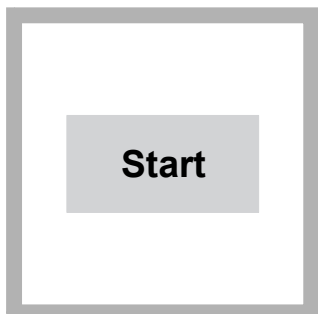
3. Tighten the cap on the vial and invert until completely mixed. Make sure that the contents are well mixed.



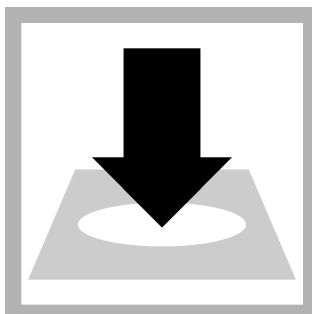
4. Start the reaction time of 5 minutes.



5. When the timer expires, clean the vial.



6. DR 1900 only: Select program 870. Refer to [Before starting](#) on page 1.



7. Insert the vial into the cell holder. DR 1900 only: Push **READ**. Results show in mg/L CaCO_3 .

Interferences

If the samples contain particles, use a 0.45 μm filter to remove the particles.

Accuracy check

Standard solution method

Use the standard solution method to validate the test procedure, the reagents and the instrument.

Items to collect:

- 25,000-mg/L CaCO_3 Alkalinity Voluette® Ampule Standard Solution
- Ampule breaker
- 100-mL volumetric flask, Class A
- Pipet, adjustable volume, 1–5 mL with pipet tips
- Deionized water

1. Prepare a 250-mg/L CaCO₃ standard solution as follows:
 - a. Use a pipet to add 1.0 mL of the standard solution into the volumetric flask.
 - b. Dilute to the mark with deionized water. Mix well. Prepare this solution daily.
 2. Use the test procedure to measure the concentration of the prepared standard solution.
 3. Compare the expected result to the actual result.
- Note:** The factory calibration can be adjusted slightly with the standard adjust option so that the instrument shows the expected value of the standard solution. The adjusted calibration is then used for all test results. This adjustment can increase the test accuracy when there are slight variations in the reagents or instruments.

Summary of Method

Carbonates and other buffers react with the reagent in the vial to change the pH. The pH has an effect on the color of the indicator, which is measured photometrically. The measurement wavelength is 615 nm.

Consumables and replacement items

Required reagents

Description	Quantity/Test	Unit	Item no.
Total Alkalinity TNT870 Reagent Set	1	25/pkg	TNT870

Required apparatus

Description	Quantity/test	Unit	Item no.
Pipet, adjustable volume, 1.0–5.0 mL	1	each	BBP065
Pipet tips, for 1.0–5.0 mL pipet	1	75/pkg	BBP068
Pipet, adjustable volume, 0.2–1.0 mL	1	each	BBP078
Pipet tips, for 0.2–1.0 mL pipet	2	100/pkg	BBP079
Light shield, DR 3900	1	each	LZV849
Light shield, DR 3800, DR 2800, DR 2700	1	each	LZV646

Recommended standards

Description	Unit	Item no.
Alkalinity Voluette® Ampule Standard Solution, 25,000-mg/L CaCO ₃ , 10-mL	16/pkg	1427810

Optional reagents and apparatus

Description	Unit	Item no.
Ampule Breaker, 10-mL Voluette® Ampules	each	2196800
Filter membrane, 0.45-micron, 25-mm	100/pkg	2514101
Filter holder, 25-mm, for Luer-type syringe	each	246800
Flask, volumetric, Class A, 100-mL glass	each	1457442
Sampling bottle with cap, low density polyethylene, 500-mL	12/pkg	2087079
Syringe, 10-cc, Luer-Lock tip	each	2202400
Water, deionized	4 L	27256



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:

In the U.S.A. – Call toll-free 800-227-4224

Outside the U.S.A. – Contact the HACH office or distributor serving you.

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