

Mercuric Thiocyanate Method
1.0 to 70 mg/L, 70 to 1000 mg/L Cl⁻

Method 10291
TNTplus® 879

Scope and application: For water and wastewater.



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 sample pH is 3–10.

The sample temperature must be 15–25 °C (59–77 °F) for accurate results.

The recommended temperature for reagent storage is 2–8 °C (35–46 °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

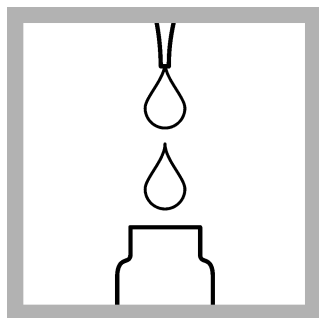
Description	Quantity
Chloride TNTplus Reagent Set	1
Pipet, adjustable volume, 0.2–1.0 mL	1
Pipet tips, for 0.2–1.0 mL pipet	1

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

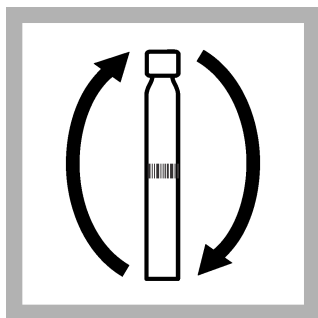
Sample collection

- Collect samples in clean glass or plastic bottles.
- If immediate analysis is not possible, keep the samples at room temperature for a maximum of 28 days.

Test procedure



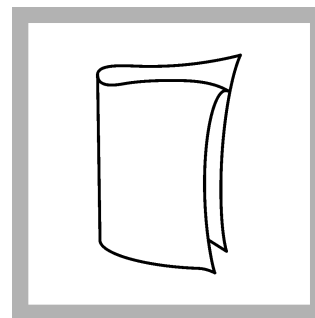
1. Use a pipet to add the applicable volume of sample to the test vial. Refer to [Table 2](#).



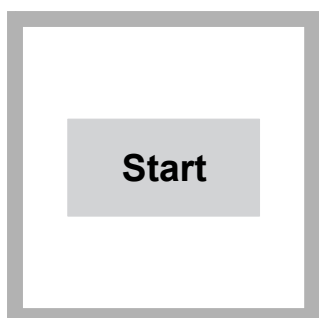
2. Tighten the cap on the vial and invert the vial 2–3 times.



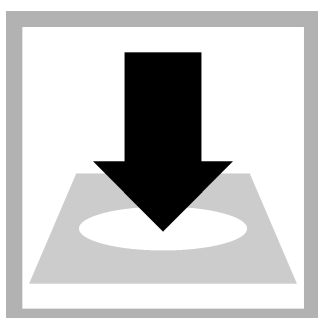
3. Start the reaction time of 3 minutes.



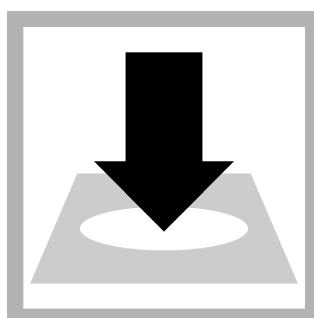
4. When the timer expires, clean the vial.



5. DR 1900 only: Select program 879. Refer to [Before starting](#) on page 1.



6. Insert the Zero vial into the cell holder. DR 1900 only: Push **ZERO**. The instrument zero is set.



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

Table 2 Sample volumes

Range	Sample volume
1 to 70 mg/L Cl ⁻	1.0 mL
70 to 1000 mg/L Cl ⁻	0.1 mL ¹

Interferences

Silver forms a precipitate with chloride and causes low results. Mercury reacts with chloride and causes low results. Bromide and iodide interfere directly and cause a positive interference. Substances that form colored complexes with iron(III) salts interfere.

To validate the test results, dilute the sample with a known volume of deionized water. Use the diluted sample in the test procedure and multiply the result by the dilution factor. As an alternative, spike the sample with a standard solution and compare the expected result to the actual result.

[Table 3](#) shows the ions that were individually examined to the given concentrations and do not cause interference. No cumulative effects or influences of other ions were found.

¹ The adjustable pipet BBP078 can measure 0.1 mL.

Table 3 Examined ions

Ion	Concentration
SO ₄ ²⁻ , NO ₃ ⁻	1000 mg/L
Pb ²⁺ , Zn ²⁺ , Ni ²⁺ , Cu ²⁺ , Cr ³⁺ , Cr ⁶⁺	50 mg/L
Cd ²⁺	10 mg/L
CN ⁻ , S ²⁻	0.4 mg/L

Accuracy check

Standard solution method

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

Items to collect:

- 1000-mg/L Chloride Standard Solution
- 500-mL volumetric flask, Class A
- 10.00-mL volumetric pipet, Class A and pipet filler safety bulb
- Deionized water

1. Prepare a 20.0-mg/L chloride standard solution as follows:
 - a. Use a pipet to add 10.00 mL of a 1000-mg/L chloride 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.

Summary of Method

Chloride in the sample reacts with mercuric thiocyanate to form mercuric chloride and liberate thiocyanate ion. Thiocyanate ions react with the ferric ions to form an orange ferric thiocyanate complex. The measurement wavelength is 468 nm.

Consumables and replacement items

Required reagents

Description	Quantity/Test	Unit	Item no.
Chloride TNTplus Reagent Set	1	25/pkg	TNT879

Required apparatus

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

Recommended standards

Description	Unit	Item no.
Chloride Standard Solution, 1000-mg/L Cl ⁻	500 mL	18349

Optional reagents and apparatus

Description	Unit	Item no.
Flask, volumetric, Class A, 500 mL, glass	each	1457449
Pipet, volumetric, Class A, 10 mL	each	1451538
Pipet filler, safety bulb	each	1465100
Safety goggles, vented	each	2550700



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