

USEPA¹ Methylene Blue Method²

Method 10294

0.1 to 2.0 mg/L Sulfide

TNTplus[®] 861

Scope and application: Measures total sulfides, H₂S, HS⁻, and some metal sulfides in groundwater, wastewater, brines and seawater.

¹ USEPA accepted for reporting wastewater analysis. Procedure is equivalent to Standard Method 4500-S²⁻ D.

² Adapted from *Standard Methods for the Examination of 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 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.

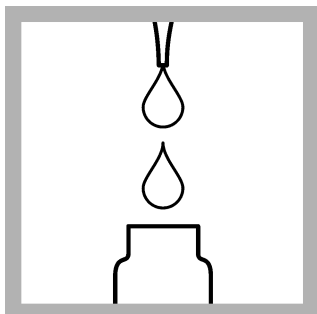
Items to collect

Description	Quantity
Sulfide TNTplus Reagent Set	1
Pipet, adjustable volume, 1.0–5.0 mL	1
Pipet, adjustable volume, 0.2–1.0 mL	1
Pipet tips	2

Sample collection

- Analyze the samples immediately. The samples cannot be preserved for later analysis.
- 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 and exposure to air.

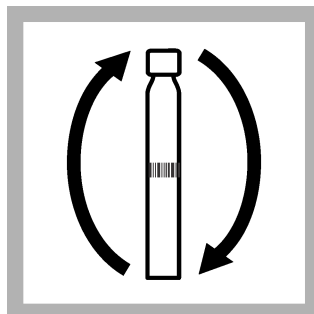
Test procedure



1. Use a pipet to add 4.0 mL of sample to the test vial.



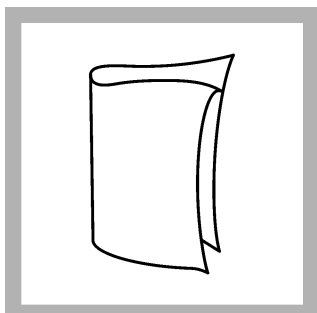
2. Use a pipet to add 0.2 mL of Solution A to the test vial.



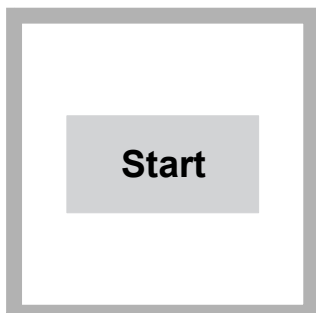
3. Tighten the cap on the vial and invert until completely mixed.



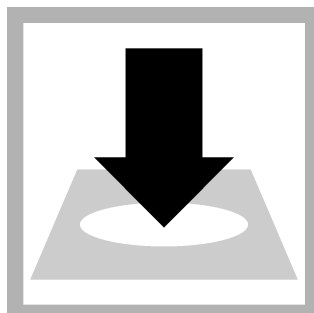
4. Start the reaction time of 10 minutes.



5. When the timer expires, clean the vial.



6. DR 1900 only: Select program 861. 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 S²⁻.

Interferences

[Table 2](#) 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.

Table 2 Examined ions

Ion	Concentration
CN ⁻	2 mg/L
I ⁻	20 mg/L
SO ₃ ²⁻	700 mg/L
SCN ⁻	900 mg/L
S ₂ O ₃ ²⁻	900 mg/L

Summary of Method

Dimethyl-p-phenylenediamine reacts with hydrogen sulfide to form leucomethylene blue. The leucomethylene blue is oxidized by iron(III) ions to form methylene blue. The measurement wavelength is 666 nm.

Consumables and replacement items

Required reagents

Description	Quantity/Test	Unit	Item no.
Sulfide TNTplus Reagent Set	1	25/pkg	TNT861

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
Pipet, adjustable volume, 1.0–5.0 mL	1	each	BBP065
Pipet tips, for 1.0–5.0 mL pipet	1	75/pkg	BBP068
Light shield, DR 3800, DR 2800, DR 2700	1	each	LZV646
Light shield, DR 3900	1	each	LZV849



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