

## Metal Phthalein Colorimetric Method

Method 10292

0.5 to 10 mg/L, 10 to 50 mg/L Mg

TNTplus® 849

**Scope and application:** For raw (untreated) water, drinking water, surface water, boiler water and process control.



### 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 4–9.

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

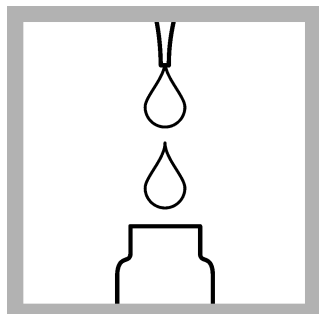
Description	Quantity
Total Magnesium TNTplus Reagent Set	1
Pipet, adjustable volume, 1.0–5.0 mL	1
Pipet, adjustable volume, 0.2–1.0 mL	1
Pipet tips	2

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

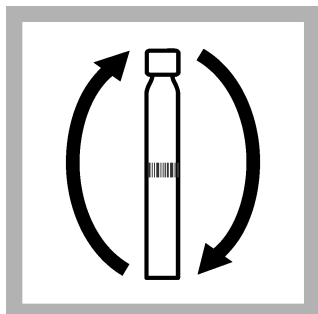
## Sample collection

- 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 and 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



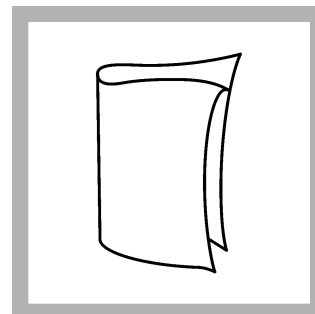
1. Use a pipet to add the applicable volume of Buffer Solution A to the test vial. Refer to [Table 2](#).



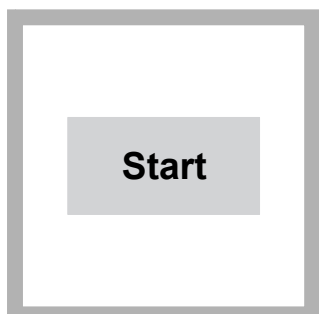
2. Tighten the cap on the vial and invert until completely mixed. Make sure that the contents are well mixed.



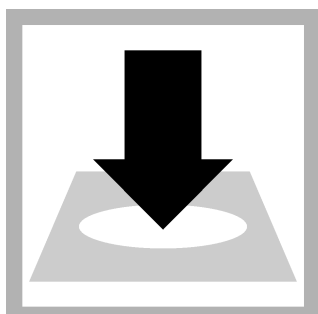
3. Start the reaction time of 2 minutes.



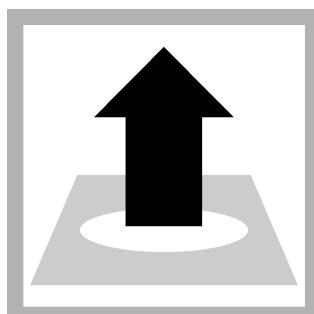
4. When the timer expires, clean the vial.



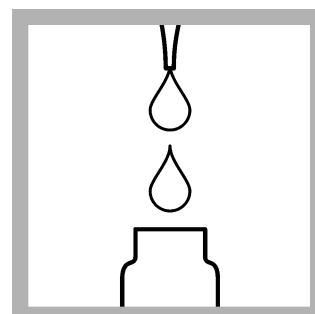
5. DR 1900 only: Select program 849. Refer to [Before starting](#) on page 1.



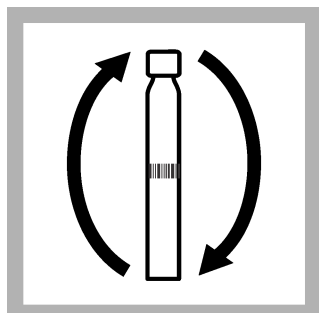
6. Insert the vial into the cell holder. DR 1900 only: Push **READ 1**. The instrument zero is set.



7. Remove the vial.



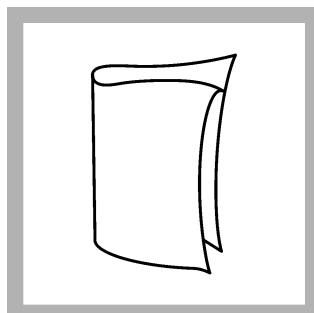
8. Use a pipet to add the applicable volume of sample to the test vial. Refer to [Table 2](#).



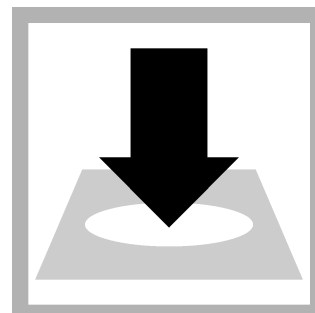
9. Tighten the cap on the vial and invert until completely mixed. Make sure that the contents are well mixed.



10. Start the reaction time of 1 minute.



11. When the timer expires, clean the vial.



12. Insert the vial into the cell holder. DR 1900 only: Push **READ 2**. Results show in mg/L Mg.

**Table 2 Reagent and sample volumes**

Range	Buffer Solution A volume	Sample volume
0.5 to 10 mg/L Mg	3.0 mL	2.0 mL
10 to 50 mg/L Mg	3.5 mL	0.5 mL

**Interferences**

If the samples contain particles, use a 0.45 µm filter to remove the particles. There are no known interferences for drinking water and boiler water samples. There is no interference from 20 mg/L calcium for the 0.5 to 10 mg/L Mg range. There is no interference from 100 mg/L calcium for the 10 to 50 mg/L Mg range.

**Summary of Method**

Calcium and magnesium ions react with metal phthalein to give a violet color. The measurement wavelength is 572 nm.

**Consumables and replacement items****Required reagents**

Description	Quantity/Test	Unit	Item no.
Magnesium TNTplus Reagent Set	1	25/pkg	TNT849

**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	2	75/pkg	BBP068
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 3900	1	each	LZV849
Light shield, DR 3800, DR 2800, DR 2700	1	each	LZV646

**Optional reagents and apparatus**

Description	Unit	Item no.
Filter membrane, 0.45-micron, 25-mm	100/pkg	2514101
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



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