Formaldehyde

DOC316.53.01529

Colorimetric Method

Method 10295

0.5 to 10.0 mg/L H_2CO

TNTplus® 871

Scope and application: For chipboard after perforation (ISO 12460), fabrics, air, cosmetics, wastewater and process analysis.

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 sample pH must be 3–10 for accurate results.
The temperature of the samples and reagents must be 15–25 °C (59–77 °F) for accurate results.
The recommended temperature for reagent storage is 15–25 °C (59–77 °F).
Make sure that the 10-minute reaction time in the block digestor is not more or less than 10 minutes.
Use the DRB reactor with 13-mm wells for the digestion. If the reactor has 16-mm wells, put adapter sleeves into the wells.
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
Formaldehyde TNTplus Reagent Set	1
DRB200 reactor with 13-mm wells	1
Pipet tips, for 1.0–5.0 mL pipet	2

Items to collect (continued)

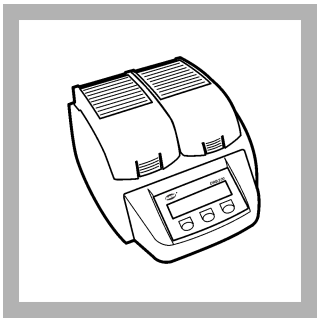
Description	Quantity
Pipet tips, for 1.0–5.0 mL pipet	1
Test tube rack	1

Refer to Consumables and replacement items on page 3 for order information.

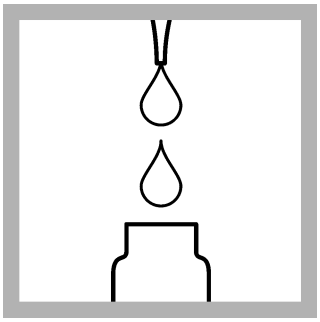
Sample collection

- 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.

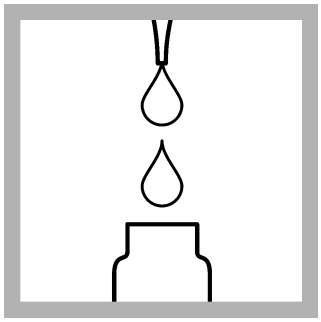
Test procedure



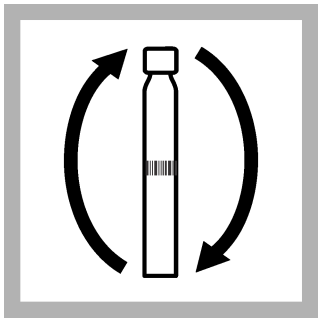
1. Set the DRB200 reactor power to on. Set the temperature to 60 °C.



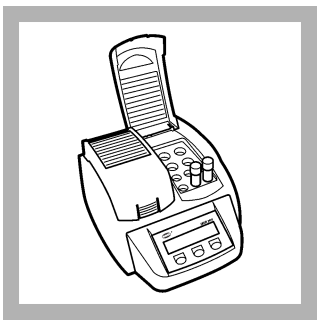
2. Use a pipet to add 1.5 mL of sample to the test vial.



3. Use a pipet to add 1.5 mL of Solution A to the test vial.

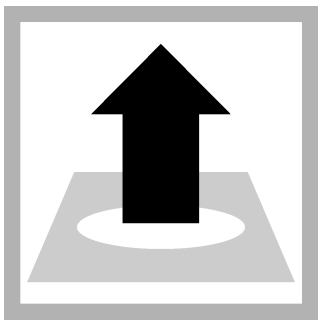


4. Tighten the cap on the vial and invert the vial 2–3 times.

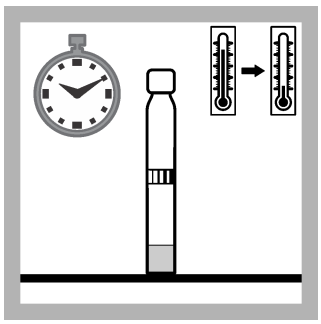


5. Insert the vial in the preheated DRB200 reactor. Close the lid.

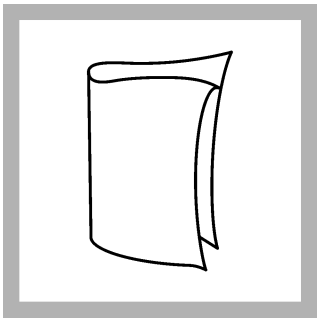
6. Start the reaction time of 10 minutes.



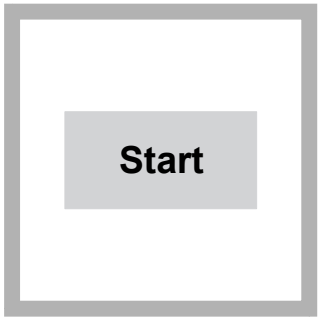
7. When the timer expires, carefully remove the vial from the reactor.



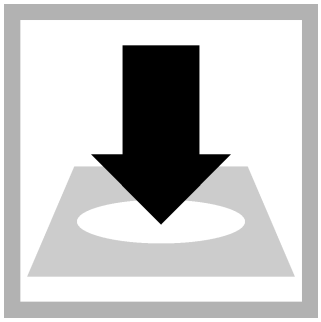
8. Let the temperature of the vial decrease for 60 minutes.



9. When the timer expires, clean the vial.



10. DR 1900 only: Select program 871. Refer to Before starting on page 1.



11. Insert the vial into the cell holder. DR 1900 only: Push **READ**.
Results show in mg/L H_2CO.

Interferences

This method is very selective and does not show interference from other aldehydes. Strong oxidizing agents 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.

Summary of Method

Formaldehyde reacts in aqueous solution with ammonium ions and acetylacetone to give a yellow dye. The measurement wavelength is 412 nm.

Consumables and replacement items

Required reagents

Description	Quantity/Test	Unit	Item no.
Formaldehyde TNTplus Reagent Set	1	25/pkg	TNT871

Required apparatus

Description	Quantity/test	Unit	Item no.
DRB 200 Reactor, 115 VAC option, 9 x 13 mm + 2 x 20 mm, 1 block	1	each	DRB200-01
DRB 200 Reactor, 230 VAC option, 9 x 13 mm + 2 x 20 mm, 1 block	1	each	DRB200-05
Pipet, adjustable volume, 1.0–5.0 mL	1	each	BBP065
Pipet tips, for 1.0–5.0 mL pipet	2	75/pkg	BBP068
Test tube rack	1	each	1864100
Light shield, DR 3800, DR 2800, DR 2700	1	each	LZV646
Light shield, DR 3900	1	each	LZV849

Optional reagents and apparatus

Description	Unit	Item no.
Reactor adapter sleeves, 16 mm to 13 mm diameter, for TNTplus vials	5/pkg	2895805
Sampling bottle with cap, low density polyethylene, 500-mL	12/pkg	2087079
Water, deionized	4 L	27256

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