Cationic surfactants

DOC316.53.01542

Method 10305

0.2–2.0 mg/L Cetyltrimethylammonium bromide

TNTplus® 885

Scope and application: For preliminary analysis of surface water, wastewater 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
DR6000	—	—
DR3900	—	LZV849
DR1900	9609900 or 9609800 (A)	—

Before starting

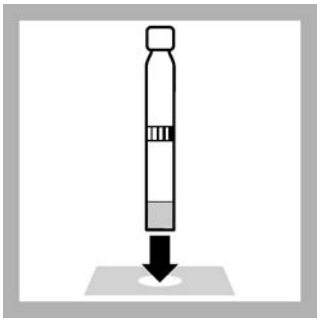
DR3900: Install the light shield in Cell Compartment #2 before this test is started.
Review the safety information and the expiration date on the package.
The temperature of the samples and reagents must be 22 °C (72 °F) for accurate results.
The recommended temperature for reagent storage is 15–25 °C (59–77 °F).
The sample pH must be 4–9 for accurate results.
DR1900: 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
TNT885	1 vial
Solution A	0.4 mL
Solution B	0.2 mL
Pipet, adjustable volume, 0.2–1.0 mL	1
Pipet tips, for 0.2–1.0 mL pipet	2
Pipet, adjustable volume, 1.0–5.0 mL	1
Pipet tips, for 1.0–5.0 mL pipet	1

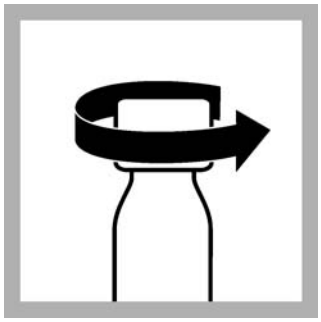
Refer to Consumables and replacement items on page 3 for order information.

Test procedure



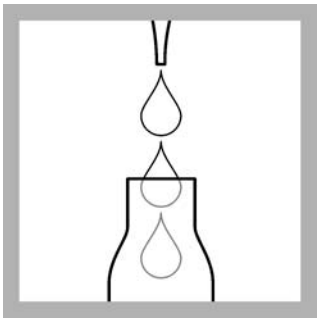
1. Put the vial into the cell holder. DR1900 only: Select program TNT885. Push **READ 1**. Refer to Before starting on page 1.

2. Remove the vial from the cell holder.



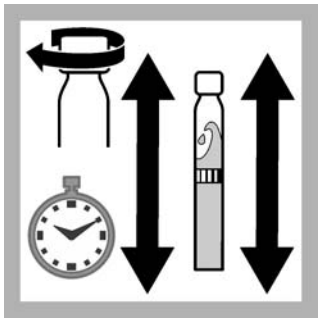
3. Open the vial.

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

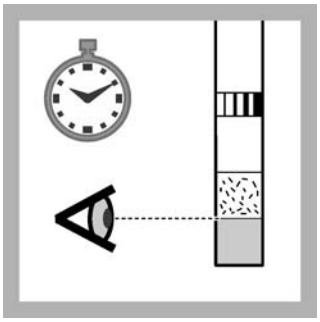


5. Use a pipet to add 0.4 mL of Solution A to the vial.

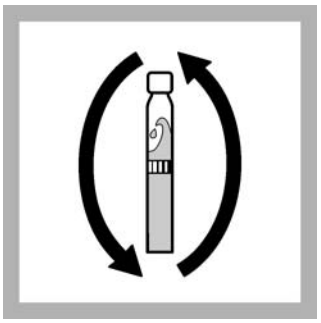
6. Use a pipet to add 0.2 mL of Solution B to the vial.



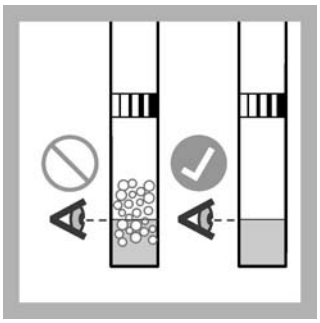
7. Put the cap on the vial. Hold the vial by the cap. Carefully shake the vial for 2 minutes.



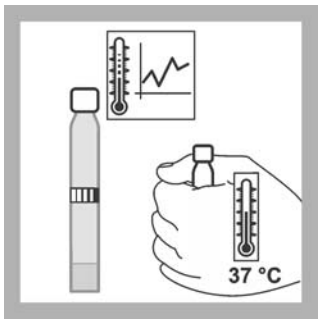
8. Keep the vial vertical for 30 seconds to let phase separation occur.



9. Hold the vial by the cap and carefully invert the vial two times.



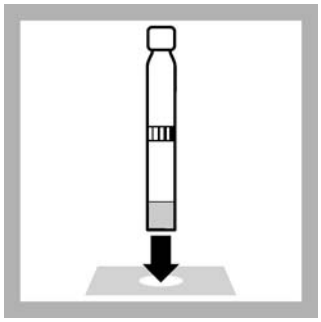
10. If streaks or small drops of water form in the lower part of the vial, carefully tilt the vial 90 degrees and rotate the vial.



11. If there is a small amount of turbidity in the chloroform phase, increase the temperature of the vial (e.g., hold the vial in a hand).

12. Clean the vial.

13. DR1900 only: Select program TNT885. Refer to Before starting on page 1.



14. Put the vial into the cell holder. DR 1900 only: Push **READ 2**. Results show in mg/L cetyltrimethylammonium bromide.

Interferences

Ions that do not cause an interference to the maximum tested concentrations are shown in Table 2. Combinations of ions were not tested.

Anionic surfactants cause low-bias results.

Do plausability checks on the measurement results (dilute and/or spike the sample).

Table 2 Interfering substances

Interference level	Interfering substance
2000 mg/L	Cl^-, Na^+
1000 mg/L	K^+, SO_4^{2-}, NO_3^-
500 mg/L	CO_3^{2-}, Ca^{2+}
200 mg/L	NH_4^+, PO_4^{3-}
100 mg/L	Mg^{2+}, NO_2^-, $S_2O_8^{2-}$
50 mg/L	Fe^{2+}, Fe^{3+}, Ni^{2+}, Zn^{2+}, Cu^{2+}, H_2O_2
25 mg/L	$S_2O_3^{2-}$, SO_3^{2-}
10 mg/L	Cr^{3+}, Cr^{6+}, Cl_2

Summary of Method

Cationic surfactants react with bromophenol blue to form complexes, which are extracted in chloroform and measured photometrically. The measurement wavelength is 414 nm.

Consumables and replacement items

Required reagents

Description	Quantity/Test	Unit	Item no.
TNT885 Reagent Set	1 vial	25/pkg	TNT885

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	2	100/pkg	BBP079

Required apparatus (continued)

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

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