

Method 10306

HPT251

0.01–1.00 mg/L Fe or 0.012–1.200 mg/L Fe (Metal Prep Set TNT890)

Scope and application: For drinking water, raw water, swimming-pool water, wastewater and process analysis.



Test preparation

Before starting

This method is applicable for the DR3900 and DR6000 only.

Review the safety information and the expiration date on the package.

The recommended temperature for reagent storage is 15–25 °C (59–77 °F).

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.

Undissolved iron and iron in samples can only be determined after digestion with Metal Prep Set TNT890. Use the reagent blank in the evaluation. The test procedure is available on the manufacturer's website.

For best results, make sure that there are no air bubbles on the inner surfaces of the cell. Tap the cell to remove air bubbles.

For sample-specific blanks (e.g., to do serial analysis of the same sample), use empty 50-mm cells (LZP341). For fast measurement, use sample-specific cells to prepare blanks and samples so a blank measurement (zero) is not necessary for each sample measured.

Review the Safety Data Sheets (MSDS/SDS) for the chemicals that are used. Use the recommended personal protective equipment.

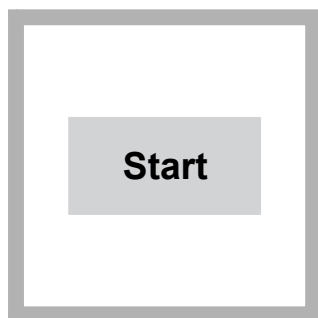
Dispose of reacted solutions according to local, state and federal regulations. Refer to the Safety Data Sheets for disposal information for unused reagents. Refer to the environmental, health and safety staff for your facility and/or local regulatory agencies for further disposal information.

Items to collect

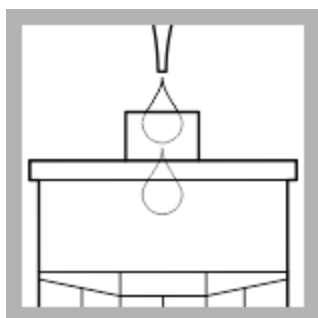
Description	Quantity
DosiCap A	1
Pipet, adjustable volume, 1.0–5.0 mL	1
Pipet tips, for 1.0–5.0 mL pipet	1

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

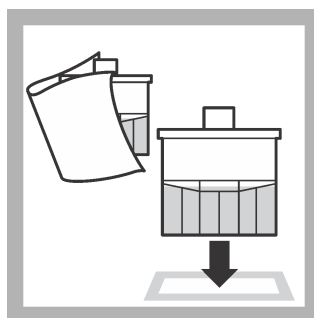
Test procedure



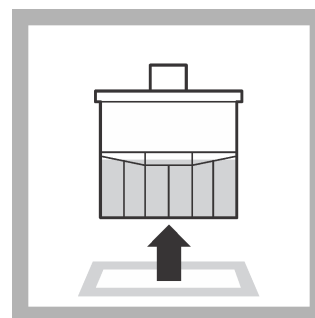
1. Start program **251**.



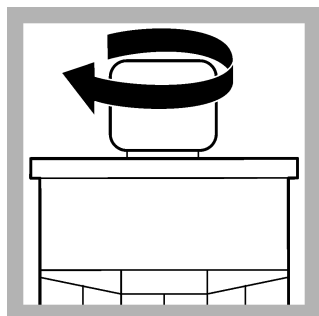
2. Add 5.0 mL of sample to the 50-mm cell.



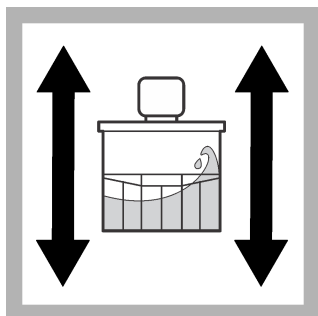
3. Clean the cell. Tap the cell to remove air bubbles. Insert the cell into the cell holder. Push **ZERO**.



4. Remove the cell from the cell holder.



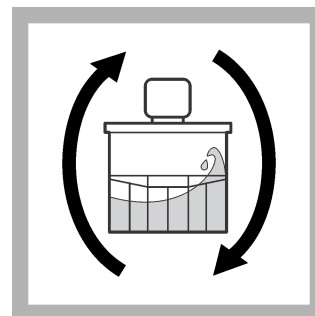
5. Put a DosiCap A on the cell and turn to tighten.



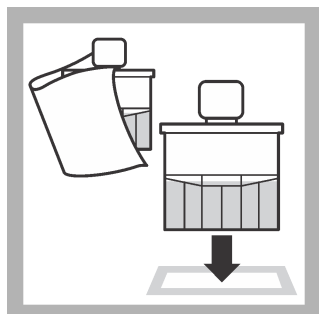
6. Shake the cell until the freeze-dried contents of the DosiCap are dissolved.



7. Set the timer for 10 minutes.



8. When the timer expires, invert the cell 3 or 4 times.



9. Clean the cell. Tap the cell to remove air bubbles. Insert the cell into the cell holder. Push **READ**.

Accuracy check

Standard solution method

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

Items to collect:

- 1 mg/L Fe standard
- 100-mL volumetric flask, Class A
- 50-mL volumetric pipet, Class A and pipet filler safety bulb
- Deionized water

1. Prepare a 0.5 mg/L Fe standard solution as follows:
 - a. Use a pipet to add 50 mL 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.

Note: The factory calibration can be adjusted slightly with the standard calibration adjust option so that the instrument shows the expected value of the standard solution. The adjusted calibration is then used for all test results. This adjustment can increase the test accuracy when there are small variations in the reagents or instruments.

Interferences

Ions that do not cause an interference to the maximum tested concentrations are shown in [Table 1](#). Combinations of ions were not tested.

Higher quantities of copper, nickel, and tin cause high-bias results.

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

Table 1 Interfering substances

Interference level	Interfering substance
1000 mg/L	Cl ⁻ , SO ₄ ²⁻
500 mg/L	K ⁺ , Na ⁺ , Ca ²⁺
50 mg/L	Pb ²⁺ , Cr ⁶⁺
40 mg/L	Cd ²⁺ , NO ₃ ⁻
25 mg/L	Ni ²⁺
15 mg/L	Cr ³⁺ , CO ₃ ²⁻
5 mg/L	Cu ²⁺ , Co ²⁺
2 mg/L	Sn ²⁺

Summary of Method

Iron(II) ions form an orange-red complex with 1.10-phenanthroline. Ascorbic acid changes the Iron(III) ions in the water sample to iron(II) ions before the complex is formed. The measurement wavelength is 485 nm.

Consumables and replacement items

Required reagents

Description	Quantity/Test	Unit	Item no.
HPT251 Reagent Set, ULR Iron	1	20/pkg	HPT251

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	1	75/pkg	BBP068

Recommended standards and apparatus

Description	Unit	Item no.
Iron Standard Solution, 1-mg/L Fe	500 mL	13949
Flask, volumetric, Class A, 100 mL	1	1457442

Recommended standards and apparatus (continued)

Description	Unit	Item no.
Pipet, volumetric, Class A, 50 mL	1	1451541
Pipet filler, 3 valve	1	1218900



FOR TECHNICAL ASSISTANCE, PRICE INFORMATION AND ORDERING:
In the U.S.A. – Call toll-free 800-227-4224
Outside the U.S.A. – Contact the HACH office or distributor serving you.
On the Worldwide Web – www.hach.com; E-mail – techhelp@hach.com

HACH COMPANY
WORLD HEADQUARTERS
Telephone: (970) 669-3050
FAX: (970) 669-2932