Aluminum DOC316.53.01004

Chromazurol S Method

Method 10215

(0.02 to 0.50 mg/L AI)

TNTplus™ 848

Scope and Application: For drinking water, surface water, swimming pool water, wastewater and process analysis.



Test preparation

How to use instrument-specific information

The *Instrument-specific information* table displays requirements that may vary between instruments. To use this table, select an instrument then read across to find the corresponding information required to perform this test.

Table 36 Instrument-specific information

Instrument	Light shield
DR 6000	_
DR 5000	_
DR 3900	LZV849
DR 3800, DR 2800	LZV646

Before starting the test:

Install the light shield if applicable (see *Instrument-specific information*).

Read the Safety Advice and Expiration Date on the package.

Recommended sample pH is 2.5–3.5.

Recommended sample and reagent temperature is 20-23 °C (68-73.4 °F).

Recommended reagent storage is 15-25 °C (59-77 °F).

If test is not performed at the recommended temperature an incorrect result may be obtained.

A higher pH causes precipitation or complexing of the aluminum so that low-bias results are obtained. If necessary the pH of the sample must be adjusted by adding a small amount of nitric acid.

TNTplus methods are activated directly from the Main Menu screen when the prepared sample vial is inserted into the sample cell holder.

Collect the following items:

Description	Quantity
Aluminum TNT848 Reagent Set	1
Light Shield (see Instrument-specific information)	1
Pipettor, variable 1–5 mL	1
Pipettor tips for 1–5 mL pipettor	1

TNTplus method



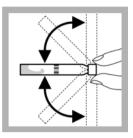
1. Pipet 2.0 mL of Solution A into the vial.



2. Pipet 3.0 mL of sample into the vial.



3. Add one level spoonful of Reagent B to the vial.



4. Cap and invert the vial 2–3 times until no more streaks can be seen in the solution.



5. Wait 25 minutes. Install the Light Shield in Cell Compartment #2.



6. Insert the Zero vial from the same reagent lot into the sample cell holder.

The instrument reads the barcode, then selects the method and sets the instrument to zero. The instrument shows L1 when zeroing is complete.



7. Thoroughly clean the outside of the prepared sample vial.



8. Insert the prepared vial into the cell holder. The instrument reads the barcode and reads the sample.

Results are in mg/L Al.

Reagent blanks

Important Note: A reagent blank can be measured, and the value subtracted from the results of each test performed using the same reagent lot number. Use deionized water in place of sample and run the procedure as described.

To subtract the value of the blank from a series of measurements, measure the blank per step 6. Press **OPTIONS>MORE>REAGENT BLANK**. Press **ON**. The measured value of the blank should be shown in the highlighted box. Press **OK** to accept this value. The reagent blank value will now be subtracted from all results until the function is turned off, or a different method is selected. Alternately, the blank can be recorded and entered at any later time by pressing the highlighted box and using the keypad to enter the value.

Sample Blanks

If the Sample Blank value falls within the allowable range, this value will be used to correct the result automatically. The instrument will subtract the Sample Blank from the uncorrected result. Samples without color or turbidity do not require sample blanks.

Interferences

The ions listed in *Interfering substances* have been individually checked up to the given concentrations and do not cause interference. Cumulative effects and the influence of other ions have not been determined

Higher concentrations of heavy metals than those given, as well as fluoride, phosphate and relatively rare elements such as e.g. beryllium, thorium, titanium, zirconium and vanadium interfere with the determination. Aluminum oxide hydrates and hydroxide are only partially determined.

Measurement results can be verified using sample dilutions or standard additions.

Table 37	Interfering	substances
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Interfering substance	Interference level
Mg ²⁺ , K+, Na+, NH ₄ +, Cl ⁻ , NO ₃ ⁻ , SO ₄ ²⁻ , Ca ²⁺	500 mg/L
Ag+, Mn ²⁺	100 mg/L
Cd ²⁺ , Co ²⁺ , Ni ²⁺ , Sn ²⁺ , Pb ²⁺ , PO ₄ ³⁻	50 mg/L
Cu ²⁺ , Hg ²⁺	10 mg/L
Fe ²⁺ , Fe ³⁺ , Zn ²⁺ , Si ⁴⁺	5 mg/L
Cr ³⁺ , Cr ⁶⁺	0.5 mg/L
F-	0.1 mg/L

Sample collection, preservation and storage

Collect samples in an acid-washed glass or plastic containers. Adjust the pH to 2 or less with nitric acid (about 2 mL per liter). Store preserved samples up to six months at room temperature. Adjust the pH to between 2.5 and 3.5 with 5.0 N sodium hydroxide before analysis. Correct the test result for volume additions.

Accuracy check

Standard solution method

- 1. Prepare a 0.4 mg/L aluminum standard solution by pipetting 1.0 mL of a 100 mg/L aluminum standard solution into a 250 mL volumetric flask.
- 2. Dilute to volume with deionized water. Prepare this solution daily. Use 3.0 mL of this standard in place of the sample in the procedure.

Summary of method

Chromazurol S forms a green colored lake with aluminum in weakly acidic acetate-buffered solutions. The amount of color formed is directly proportional to the amount of aluminum present in the sample. Test results are measured at 620 nm.

Consumables and replacement items

Required reagents

Description	Quantity/Test	Unit	Cat. No.
Aluminum TNT 848 Reagent Set	1	24/pkg	TNT848

Required apparatus

Description	Quantity	Unit	Cat. No.
Pipettor, variable volume, 1–5 mL	1	each	BBP065
Pipettor Tips, for BBP065 pipettor	1	75/pkg	BBP068

Recommended standards

Description	Unit	Cat. No.
Aluminum Standard Solution, 100 mg/L	100 mL	1417442
Aluminum Standard Solution, 10 mg/L as Al ³⁺	100 mL	2305842
Aluminum Standard Solution, 10-mL Voluette Ampule, 50-mg/L as Al	16/pkg	1479210
Nitric Acid, ACS	500 mL	15249
Sodium Hydroxide Standard Solution, 5.0 N	100 mL MDB	245032
Sodium Hydroxide Standard Solution, 5.0 N	59 mL SCDB	245026
Water, deionized	4 L	27256

Optional reagents and apparatus

Description	Unit	Cat. No.
Bottle, Sampling, low density poly, w/cap, 500 mL	12/pkg	2087079
Flask, volumetric 250 mL, Class A	each	1457446
pH Paper, 0–14 pH range	100/pkg	2601300
Pipet, volumetric 1.0 mL, Class A	each	1451535
Test Tube Rack, 13-mm vials	each	2497900
Vials, sample blank	5/pkg	TNT919