

Instruction Sheet

Thermo Scientific Orion AQUAfast AC4078 Iron (Total & Soluble) Ampoules

This instruction sheet provides step-by-step instructions for using the Thermo Scientific™ Orion™ AQUAfast™ AC4078 Iron (Total & Soluble) Auto-Test Ampoules with the Orion AQUAfast AQ4000 colorimeter. The Orion AQUAfast Auto-Test ampoules are designed for use with the Orion AQUAfast AQ4000 colorimeter. Auto-Test ampoules contain a pre-measured amount of liquid reagent and easily fill with the correct volume of sample for simplified reagent and sample mixing. Each ampoule contains an Auto-ID barcode that is read by the AQ4000 colorimeter and used to automatically identify the test parameter and initiate the test. For complete setup and operation instructions for the colorimeter, consult the Orion AQUAfast AQ4000 colorimeter user guide.

Product: AC4078
Revision Date: April 6, 2015
256446-001 Revision B

Product Information

AC4078 Iron (Total & Soluble) Auto-Test Ampoules

0.2 – 6.0 mg/L

Program ID# 010

Test Method Overview

The Iron (Total & Soluble) Auto-Test method employs the phenanthroline chemistry.^{1,2} Ferrous iron reacts with 1,10-phenanthroline to form an orange colored complex in direct proportion to the ferrous iron concentration. Total iron is determined by adding a mixture of thioglycolic acid and ammonia to the sample. This mixture dissolves most forms of particulate iron. Results are expressed in ppm (mg/Liter) Fe. Various metals will produce high test results.

1. APHA Standard Methods, 18th ed., Method 3500-Fe D (1992)
2. ASTM D 1068-88, Iron in Water, Test Method A

Safety Information

Read the Safety Data Sheet (SDS) before performing this test. Wear safety glasses and gloves.

Sample Pretreatment for Very Insoluble Iron

Certain forms of very insoluble iron (magnetite, ferrite, etc.) require the following digestion procedure in place of the Total Iron Test Procedure:

- a. Fill a heat-resistant glass container to 25 mL with sample.
- b. Add 5 drops of Iron Activator solution to the sample and stir briefly.
- c. Gently boil the sample to reduce its volume to 10-15 mL.
- d. Cool the sample and dilute it to 25 mL with iron-free water.
- e. Perform the Soluble Iron Test Procedure, beginning with step 2, using this sample.

Test Procedure

Note: Before testing, zero the Orion AQUAfast AQ4000 colorimeter using a sealed zero vial from the Orion AQUAfast Zero Auto-Test Kit, Cat. No. AQ4ZER. If the sample is colored, use the sample cup provided to dilute the sample using the following steps: 1) Add 10 mL of sample and 5 mL of deionized water to the sample cup for a total of 15 mL. 2) Transfer the diluted sample to a clean, dry screw top vial from the Zero Auto-Test Kit and use that vial to zero the meter. 3) See the AQ4000 colorimeter user guide for details on the zero procedure for the colorimeter. Discard the diluted sample after the zero procedure. Repeat for each colored sample. Re-zero with the sealed zero vial before testing any colorless samples.

Soluble Iron Test Procedure

1. Fill the sample cup to the 25 mL mark with the sample. *See Figure 1.*
2. Place the Auto-Test ampoule in the sample cup. Snap the tip by pressing the ampoule against the side of the cup. The ampoule will fill leaving a small bubble to facilitate mixing. *See Figure 2.*
3. Mix the contents of the ampoule by inverting it several times, allowing the bubble to travel from end to end each time. Wipe all liquid from the exterior of the ampoule.
4. Insert the ampoule into the AQ4000 colorimeter. Align the ▼ on the Auto-Test ampoule with the ◆ on the adapter to obtain a continuous beeping and view ***** across the display. If ***** and beeping are not observed, rotate the ampoule to the right or left to initiate the measurement.
5. Immediately cover the ampoule with the colorimeter's light cover.
6. The AQ4000 will begin a 1 minute countdown. After the countdown is completed, the AQ4000 will automatically proceed to the measure mode.
7. Record the concentration reading from the AQ4000 display as either mg/L or ppm Fe or log measurement into the data logger by pressing the log key.

Total Iron Test Procedure

1. Fill an empty sample cup to the 25 mL mark with the sample. *See Figure 1.*
2. Add 5 drops of Iron Activator solution to the contents of the sample cup. *See Figure 3.* Stir briefly with the tip of the ampoule to mix the contents of the sample cup.
3. Wait 4 minutes and stir the contents of the sample cup again with the tip of the ampoule.
4. Perform the Soluble Iron Test Procedure, beginning with step 2, using this sample.

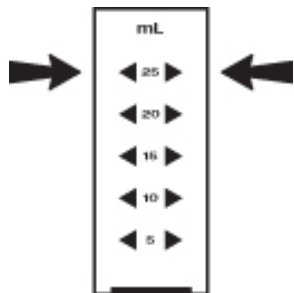


Figure 1:

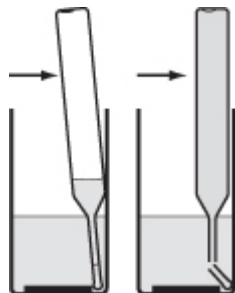


Figure 2:



Figure 3:

Ordering Information

Cat. No.	Description
AC4078	Orion AQUAfast Iron (Total & Soluble) Auto-Test Kit, 30 Ampoules
AC4010	Orion AQUAfast Ammonia as N Ultra Low Range Auto-Test Kit, 30 Ampoules
AC4070	Orion AQUAfast Chlorine (Free & Total) Auto-Test Kit, 30 Ampoules
AC4046	Orion AQUAfast Nitrite as N Auto-Test Kit, 30 Ampoules
AC4082	Orion AQUAfast Sulfate Auto-Test Kit, 30 Ampoules
AC4016	Orion AQUAfast Sulfide (Soluble) Auto-Test Kit, 30 Ampoules
AQ4ZER	Orion AQUAfast Zero Vial Auto-Test Kit
AQ4CBL	Orion AQUAfast RS232 Cable for AQ4000 Colorimeter
AQ4000	Orion AQUAfast AQ4000 Colorimeter, Includes 4 AA Batteries, 16 mm Vial, Zero Vial Auto-Test Kit, 16 mm Vial Adapter, 13 mm Vial Adapter, Field Case, User Guide, Tablet Tampering Stir Rod, Vial Cleaning Brush

For a complete listing of all available Thermo Scientific Orion AQUAfast reagents, colorimeters and accessories, please visit www.thermoscientific.com/water.

Contact Information

Thank you for your continued support of Thermo Scientific Orion products. Please visit www.thermoscientific.com/water to view the Orion meter, electrode, sensor and solution products and download product literature, user guides and software updates. To access additional product support files, please visit our [Online Library](#).

For any questions or if you require assistance, contact our Technical Support Specialists:

Email wai.techservbev@thermofisher.com

Within the United States, call 1-800-225-1480

Outside the United States, call +1-978-232-6000

For additional product information, contact your local authorized dealer, local Thermo Scientific Orion technical sales representative or contact us using the Water and Lab Products (WLP) contact information below.

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Water and Lab Products

North America
Toll Free: 1-800-225-1480
Tel: 1-978-232-6000
info.water@thermofisher.com

Germany
Tel: (49) 6184-90-6000
info.water.uk@thermofisher.com

India
Tel: (91) 22-4157-8800
wai.asia@thermofisher.com

Japan
Tel: (81) 045-453-9175
wai.asia@thermofisher.com

China
Tel: (86) 21-68654588
wai.asia@thermofisher.com

Singapore
Tel: (65) 6778-6876
wai.asia@thermofisher.com

Australia
Tel: (613) 9757-4300
In Australia: (1300) 735-295
InfoWaterAU@thermofisher.com