

# Instruction Sheet

## *Thermo Scientific Orion AQUAfast AC4082 Sulfate Ampoules*

This instruction sheet provides step-by-step instructions for using the Thermo Scientific™ Orion™ AQUAfast™ AC4082 Sulfate 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.

<b>Product: AC4082</b>
<b>Revision Date: April 6, 2015</b>
256448-001 Revision C

## Product Information

AC4082 Sulfate Auto-Test Ampoules

10 – 100 mg/L

Program ID# 027

## Test Method Overview

The Sulfate Auto-Test method employs the turbidimetric method.<sup>1,2,3</sup> Sulfate ions react with barium chloride in an acidic solution to form a suspension of barium sulfate crystals of uniform size. The resulting turbidity is proportional to the sulfate concentration of the sample. Results are expressed in ppm (mg/L) SO<sub>4</sub>.

1. APHA Standard Methods 20<sup>th</sup> ed., Method 4500-SO<sub>4</sub><sup>2-</sup> E (1998)
2. EPA Method for Chemical Analysis of Water and Wastes, Method 375.4 (1983)
3. ASTM 516-90 (1995), Sulfate Ion in Water

## Safety Information

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

## Sample Pretreatment

If the sample is turbid, it must be filtered prior to performing this test procedure.

## 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, transfer some of the sample to a clean, dry vial from the Zero Auto-Test Kit and use that vial to zero the meter. See the AQ4000 colorimeter user guide for details on the zero procedure for the colorimeter. Repeat for each colored sample. Re-zero with the sealed zero vial before testing any colorless samples.

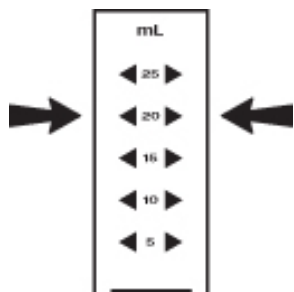
1. Fill the sample cup to the 20 mL mark with the sample. See *Figure 1*.
2. Add 7 drops of Acidifier solution to the contents of the sample cup. See *Figure 2*. Stir briefly with the tip of the ampoule to mix the contents of the sample cup.

**Note:** If bubbles occur on the side of the cup, there may be extremely high alkalinity levels. Continue to stir with the ampoule for approximately 1 minute to disperse the bubbles.

3. Add 1 level scoop of the Activator powder to the same sample cup. See Figure 3. Stir briefly with the tip of the ampoule to mix the contents of the sample cup.

**Note:** It is not critical for all of the powder crystals to dissolve.

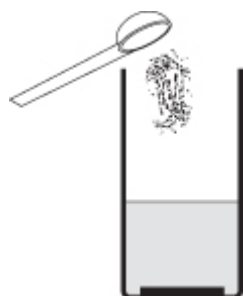
4. Place the Auto-Test ampoule in the sample cup. Snap the tip by pressing the ampoule against the side of the cup. The ampoule will fill leaving a small bubble to facilitate mixing. See Figure 4.
5. Mix the contents of the ampoule by inverting it several times, allowing the bubble to travel from end to end each time. Wipe all liquid from the exterior of the ampoule.
6. 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.
7. Immediately cover the ampoule with the colorimeter's light cover.
8. The AQ4000 will begin a 1 minute countdown. After the countdown is completed, the AQ4000 will automatically proceed to the measure mode.
9. Record the concentration reading from the AQ4000 display as either mg/L or ppm SO<sub>4</sub> or log measurement into the data logger by pressing the log key.



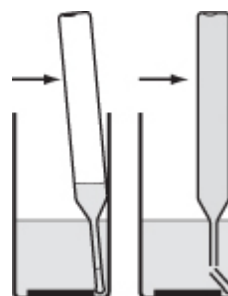
**Figure 1:**



**Figure 2:**



**Figure 3:**



**Figure 4:**

## Ordering Information

Cat. No.	Description
AC4082	Orion AQUAfast Sulfate 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
AC4078	Orion AQUAfast Iron (Total & Soluble) Auto-Test Kit, 30 Ampoules
AC4046	Orion AQUAfast Nitrite as N 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](http://www.thermoscientific.com/water).

## Contact Information

Thank you for your continued support of Thermo Scientific Orion products. Please visit [www.thermoscientific.com/water](http://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:

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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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