

Troubleshooting Guide

The most important principle in troubleshooting is to isolate the components of the system and check each in turn. The components of the system are: 1) Meter, 2) Electrodes, 3) Standard, 4) Sample, and 5) Technique.

Meter

The meter is the easiest component to eliminate as a possible cause of error. Orion meters are provided with an instrument checkout procedure in the instruction manual and a shorting strap for convenience in troubleshooting. Consult the manual for complete instructions and verify that the instrument operates as indicated and is stable in all steps.

Electrodes

1. Rinse electrodes thoroughly with distilled water.
2. Check electrode operation (slope).
3. If electrode fails this procedure, see **Measuring Hints**.
4. Repeat step 2, **Checking Electrode Operation, (Slope)**.
5. If the electrodes still do not perform as described, determine whether the fluoride or reference electrode is at fault. To do this, substitute a known working electrode for the electrode in question and repeat slope check.
6. If the stability and slope check out properly, but measurement problems persist, the sample may contain interferences or complexing agents, or the technique may be in error. See **Standard, Sample, and Technique** sections.
7. Before replacing a “faulty” electrode, or if another electrode is not available for test purposes, review the instruction manual and be sure to:
 - Clean the electrodes thoroughly
 - Prepare the electrodes properly
 - Use proper filling solutions, TISAB, and standards
 - Measure correctly
 - Review **Troubleshooting Checklist**

Standard

The quality of results depends greatly upon the quality of the standards- ***ALWAYS prepare fresh standards when problems arise*** - it could save hours of frustrating troubleshooting! Error may result from contamination of prepared standards, accuracy of dilution, quality of distilled water, or a mathematical error in calculating the concentrations.

The best method for preparation of standards is by serial dilution. This means that an initial standard is diluted, using volumetric glassware, to prepare a second standard solution. The second standard solution is similarly diluted to prepare a third standard, and so on, until the desired range of standards has been prepared.

Sample

If the electrodes work properly in standards but not in sample, look for possible interferences, complexing agents, or substances, which could affect response or physically damage the sensing electrode or the reference electrode. If possible, determine the composition of the samples and check for problems. See **Sample Requirements, Interferences, and pH Requirements**.

Technique

Check the method of analysis for compatibility with your sample. Direct measurement may not always be the method of choice. If a large amount of complexing agents are present, known addition may be best. If the sample is viscous, analate addition may solve the problem. If working at low-level, be sure to follow the **Low-Level Measurement Technique**.

Also, be sure that the expected concentration of the ion of interest is within the electrode's limits of detection.

If problems persist, review operational procedures and instruction manuals to make sure that proper technique has been followed. Reread **Measuring Hints** and **Analytical Procedures**.

Assistance

After troubleshooting all components of your measurement system, contact The Technical Edge™ for Orion products. Within the United States call 1.800.225.1480, outside the United States call 978.232.6000 or fax 978.232.6031. In Europe, the Middle East and Africa, contact your local authorized dealer. For the most current contact information, visit www.thermo.com.