

Orion pH, ORP and ISE Applications

Tris, Sulfides and Proteins

Recommended Electrodes

Separate pH and Reference Electrodes

Orion 81-01 and 80-05 or 80-05U

Any Orion ROSS Ultra™, AquaPro or Tris Calomel Line Combination Electrode

Pure Water Samples

Recommended Electrodes and Solutions

Combination Electrode Orion 81-02 or 81-02U

Pure Water Test Kit and Buffers Test Kit

Orion 700001 (contains 4 bottles pH 4.10, 2 bottles pH 6.97, 2 bottles pHISA adjustor and application information)

pH A Buffer, pH 4.10 (4 x 1 pint)

Orion 700402

pH B Buffer, pH 6.97 (4 x 1 pint)

Orion 700702

pH C Buffer, pH 9.15 (4 x 1 pint)

Orion 700902

pHISA Adjustor (5 x 60 mL)

Orion 700003

Colloids, Suspensions, Sludges and Slurries

Recommended Electrodes

Separate pH and Reference Electrodes

Orion 91-61 and 90-01 or 81-01 and 80-03

Sure-Flow Combination Electrodes

Orion 82-72, 81-72, 81-65, 81-75, 91-72, 91-65

Sleeve Junction Combination Electrodes

Orion 81-66 or 91-66

pHuture™ Sure-Flow FET Probes

Orion 61-57, 61-58, 61-78, 61-75, 61-65, 61-66, 61-79

AquaPro Combination Electrodes

Orion 91-02AP, 91-03AP, 91-04AP, 91-15AP, 91-35AP, 91-56AP

Emulsions

Recommended Electrodes

Separate pH and Reference Electrodes

Orion 91-61 and 90-01 or 81-01 and 80-03

Sure-Flow Combination Electrodes

Orion 82-72, 81-72, 81-65, 81-75, 91-72, 91-65

Sleeve Junction Combination Electrodes

Orion 81-66 or 91-66

pHuture Sure-Flow FET Probes

Orion 61-57, 61-58, 61-78, 61-75, 61-65, 61-66, 61-79

AquaPro Combination Electrodes

Orion 91-02AP, 91-03AP, 91-04AP, 91-15AP, 91-35AP, 91-56AP

Solids and Flat Surfaces

Recommended Electrodes

Flat Surface Measurements

Orion 81-35U, 91-35, 61-57 (pHuture FET), 91-35AP

Solids and Semi-solids Containing no Protein

Orion 91-63 (Spear tip for piercing), 91-62 (rugged bulb)

Solids and Semi-solids Containing Protein

Orion 81-63 or 82-63 (Spear tip for piercing), 81-04U or 91-04AP (rugged bulb)

Meats and Meat By-products

Orion 71-20 KNipHE® pH Electrode

pH Applications

Choosing the right electrode for a particular application may be as simple as choosing an epoxy bodied electrode for field work or a semi-micro electrode for small samples. However certain samples require specific electrode types to avoid errors due to drift or clogged junctions. The most common difficult samples, observed problems and recommended electrodes are listed below.

Tris, Sulfides and Proteins

- Common Problem: Clogged Junction Due to Silver Precipitate

If a Ag/AgCl electrode is used, the junction may clog if the sample contains a species that complexes or precipitates silver. Tris, sulfide and proteins are common examples. An electrode containing a reference other than Ag/AgCl, such as ROSS Ultra™, ROSS™ or calomel, is recommended for these samples. The new AquaPro electrodes with their isolated reference system and non-clogging junction are also recommended for these samples.

Pure Water Samples

- Common Problems: Slow Response, Drift, Irreproducible Results

Pure water samples cover a wide range of water types: distilled, deionized, process, well, surface, boiler feed, and rain water. These samples have relatively low ionic strength and are therefore poor conductors. Pure water solutions act as “antennae”, resulting in noisy electrode response. A second difficulty is the differences in ionic strength between the sample and the calibration buffers. After calibration in a high ionic strength buffer, a long stabilization period may occur in the pure water sample. The sample may also be contaminated if adequate rinsing is not performed or if the pH filling solution leaks into the sample over a period of time. The Orion Pure Water® test kit includes low ionic strength calibration buffers and a sample additive, pHISA®, to increase the sample’s ionic strength for stable, reproducible readings.

Colloids, Suspensions, Sludges and Slurries

- Common Problems: Slow Response, Drift, Measurement Errors

The problems often result from clogging of the electrode junction. Ceramic reference junctions are not recommended for these types of samples. Using a sleeve or Sure-Flow® junction minimizes clogging to improve electrode response and reproducibility. In addition, sleeve type reference junctions are easy to clean. The new Orion AquaPro electrodes with their isolated reference system and non-clogging junction are also recommended for these samples.

Emulsions

- Common Problems: Slow Response, Drift, Irreproducible Results, “Electrode Fatigue”

The first two problems often result from clogging of the electrode junction. Ceramic reference junctions are not recommended for these types of samples. Using a sleeve or Sure-Flow junction minimizes clogging to improve electrode response and reproducibility. The last two problems often result from surfactant interaction with or coating of the sensing glass. Soaking the electrode(s) between measurements and overnight in electrode storage solution should alleviate any problems. The new Orion AquaPro electrodes with their isolated reference system and non-clogging junction are also recommended for these samples.

Solids and Flat Surfaces

- Common Problem: Spherical Electrode Bulb Construction

Measuring the pH of a solid or flat surfaces is a problem of the past. Thermo manufactures specially designed electrodes for measuring flat surfaces, such as paper, solids and semi-solids, such as cheese. The new Orion AquaPro electrodes with their isolated reference system and non-clogging junction are also recommended for these samples.