

Sulphide Ion Selective Electrode Instruction Manual

This electrode is designed for the detection and analysis of sulphide ions in aqueous solutions and is suitable for laboratory applications.

Required equipment

- A pH/mV meter or specific ion meter
- A magnetic stirrer
- Beakers

Required solutions

- Sulphide Anti-Oxidant Buffer (SAOB):
To approximately 600ml of distilled Water in a 1000ml beaker add 200ml of 10N NaOH, 35 grams of ascorbic acid and 67 grams of Di-sodium EDTA. Stir completely until everything dissolves. Dilute to the 1000ml mark with distilled water. Prepare fresh every couple of weeks. Handle with care.
- Sulphide Standard Solution 0.1M (for measurement in units of mol/L):
To prepare this solution, half fill a 1 liter volumetric flask with distilled water and add 24.018 grams of reagent-grade sodium sulfide ($\text{Na}_2\text{S}\cdot 9\text{H}_2\text{O}$). Swirl the flask gently to dissolve the solid and fill to the mark with distilled water. Cap the flask and upend several times to mix the solution.
- Sulphide Standard Solution 1000ppm (for measurement in units of ppm):
To prepare this solution, half fill a 1 liter volumetric flask with distilled water and add 7.49 grams of reagent-grade sodium sulfide. Swirl the flask gently to dissolve the solid and fill to the mark with distilled water. Cap the flask and upend several times to mix the solution.

Prior to use

- Remove the protective cap. Connect the electrode to meter. Rotate and push the BNC connector clockwise until it locks.
- Soak the electrode in 100ppm sulphide standard solution for at least 10 minutes.

Electrode slope

If necessary, follow the steps below to check the electrode slope.

1. Pour 50ml of distilled water and 50ml of SAOB into a 150ml beaker.
2. Place the beaker on the magnetic stirrer and begin stirring at a constant rate. Set the mode switch on the meter to mV.
3. Pipette 1ml of 0.1M or 1000ppm standard solution into the beaker. When the reading is stable, record the mV value "E1".
4. Pipette 10ml of 0.1M or 1000ppm standard solution into the beaker. When the reading is stable, record the mV value "E2".
5. Determine difference between the first and second mV readings. The slope value should be 28 ± 4 mV at 25°C.

Measurement

- The ionic strength of the standards and solutions should be kept constant between all standards and samples. The pH also needs to be controlled and the sulphide ions prevented from oxidising. This is achieved by the simple addition of a sulphide anti oxidant buffer. Typical ratio is 1:1 sample or standard plus SAOB.
- Samples must fall in the pH range of 2 to 12.
- Ensure that the temperature of all standards and samples are the same to reduce errors.
- Using a magnetic stirrer for laboratory analysis is recommended but not essential.
- Prior to sample measurement ensure that the electrode is thoroughly rinsed with de-ionised water.
- Avoid strongly acidic or alkaline samples, strong detergents and organic solvents.
- Begin calibration from the lowest concentration standard to avoid cross contamination. Calibration should cover the anticipated range of the samples.

Using an Ion Meter:

- 1.1 Calibrate the meter according to the manufacturer's instructions.
- 1.2 Rinse the electrode in deionised water and blot dry.
- 1.3 Place the beaker with sample on the magnetic stirrer, and begin stirring.
- 1.4 Place the electrode in the sample and record the stable reading.

Using a pH/mV Meter:

- 2.1 Turn function switch to mV measurement.
- 2.2 Using semi-logarithmic graph paper, prepare a calibration curve by plotting the mV values of standard solutions.
- 2.3 Place the electrode in the sample and record the stable mV value.
- 2.4 Using the calibration curve determine the unknown sample concentration.

Storage and maintenance

- After use rinse with deionised water, wipe clean with a tissue or lint free cloth, replace protective cap and store dry in its box.
- If performance becomes sluggish, rinse with dilute detergent, rinse with de-ionised water and immerse the tip in a 1000ppm Sulphide solution for 1 hour.
- Should further conditioning be requires rub down the crystal surface with a very fine emery paper until the surface has a grey shiny appearance. Stand electrode in 100ppm sulphide solution for 20 minutes.

Specification

PARAMETER	SPECIFICATION
Concentration Range	1×10^{-7} ~1M, 0.003~32100ppm
pH Range	2~12pH
Temperature Range	0~80°C, 32~176°F
Interferences	Ag ⁺ , Hg ²⁺
Cable Length	100cm
Dimensions	120 (L) × 12 (Dia.)mm
Connector	BNC
