Some More Hints.

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. It is however important to have the stirrer set on a low constant speed which must be reproducible for all measurements.

Prior to sample measurement ensure that the ISE and reference electrodes are thoroughly rinsed with deionised water and dabbed with a lint free tissue.

Prepare standards by serial dilution. Make sure your electrode is conditioned by leaving the tip in the lowest concentration standard (with ISAB added) for 20 minutes prior to analysis.

Methods of Analysis.

Direct Potentiometry is described above. This method is simplified by using a direct reading Ion Meter such as the Model QP459. There are several other methods, which are useful.

Known Addition: An incremental technique where the potential of the sample solution is measured, followed by addition of a small volume of a higher concentration standard solution. This is available directly on the Model QP459 and is ideal for low concentration samples with an awkward matrix.

Sample Addition: An incremental technique where the potential of a dilute standard solution is measured followed by the addition of a small volume of more concentrated sample. Ideal for concentrated samples with an awkward matrix.

End Point Titration: ISE's are ideal end point indicators and will produce a significant potential change at the equivalence point. The Ion in question must be contained in the titrand or the titrant and must therefore be in excess or absence at the end point. For applications advice please visit www.edt.co.uk or email info@edt.co.uk.uk

1227 - Cupric Mono ISE

Overall Length	155mm
Body Diameter	12mm
Cap Diameter	16mm
Connector	BNC
Cable Length	1000 mm
Resistance at 25°C	<2.5 Meg Ohm
Concentration Range	0.4 - 64,000 ppm
Slope	23 t0 29 mV/decade
Potential Drift	2mV Per Day
Operating pH Range	2 to 7
Temperature Range	5 - 50°C
Endpoint Time	Typically 30 - 60 secs
Interferences: Ions with coefficients above 0.001	Mercury, Silver, Sulphide

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EDT directION
ELECTROCHEMISTRY PRODUCTS

**Excellence & Innovation
in Electrochemistry**

Instruction Manual

1227 - Cupric Mono ISE

The EDT directION Half Cell Cupric Ion Selective Electrode has a solid-state PVC Polymer membrane and is designed for the detection and analysis of Copper ions in aqueous solutions. It is suitable for use in the field in the laboratory and for continuous work in open systems.
A separate reference is required to make a measurement and the selection of the correct reference electrode for the application is important. Scan the QR code for guidance on the correct reference electrode to use.

The options are as follows:

E8195 Double Junction Reference Electrode for Laboratory work. 5094 Flow plus Reference electrode for viscous or awkward samples. E8197 Solid state reference Electrode for field use or continuous monitoring.

Results can be obtained in direct concentration units using the QP459 Ion Meter and a QPBNCREF Half-Cell Adapter.

Installation

Connect the ISE to the mV or ion meter. Remove the black protective cap and keep it in a safe place. Connect a suitable reference electrode.
The ISE can be used immediately but pre-soaking for 20 minutes in a 1000ppm Copper solution with ISAB is recommended.
The ionic strength of the standards and solutions should be kept constant between all standards and samples. This is achieved by the simple addition of a Ionic strength adjustment buffer. A typical addition would be 2 ml of 1M ISAB to 50 ml of standard and sample.
For some applications it is not possible to add ISAB but for low level measurements below around 50 ppm the errors are relatively small.
Temperature changes will cause errors and automatic correction is not possible. For best results ensure that standards and samples are measured at the same temperature.
Begin calibration from the lowest concentration standard to avoid cross contamination. Calibration should cover the anticipated range of the samples. Rinse tip of both electrodes with deionised water between measurements.
Avoid strongly acidic or alkaline samples, strong detergents and organic solvents.

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 solution and immerse the tip in a 1000ppm Copper solution for 20 minutes.

Tips For Successful Analysis

Ion Meters will provide direct concentration readouts saving time and effort in constructing calibration curves and performing calculations. The QP459 ION meter is recommended as it has an ion mode which includes data storage and diagnostics functions.

If a mV meter is used, ensure the resolution is to +/- 0.1mV. To get a linear calibration you will need to plot mV vs Log of Concentration.

If using a magnetic stirrer/stirrer please operate at the lowest constant speed available.

For more advice, application methods or further information on this product please go to www.edt.co.uk or contact us on info@edt.co.uk

Required Solutions

Distilled or deionised water will be required to prepare Standards, ISABs and to rinse the electrode between measurements.

1000 ppm Stock Standard solution Cat No. 21306.

ISAB Cat No. 30306. Used to adjust the Ionic strength of all standards and samples. Typical addition is 2ml of ISAB to 50ml of all standards and samples.

Operation

① Connect the electrodes to the meter being used for analysis
② Prepare a series of (at least 2) standards that bracket the expected sample concentration. This is best done by serial dilution of the stock solution. Ideally standards should be a decade in concentration apart e.g. 1, 10, and 100 ppm.
③ Dispense 50 ml of each standard into analytically clean beakers (100 to 150 ml size is perfect) Add ISAB in the appropriate ratio. As a guide with sample concentrations in the 1 to 1000 ppm range 2ml of a 1Molar ISAB to 50 ml sample is satisfactory.
④ Rinse the electrodes with deionised water and blot dry with a lint free cloth and place in the lowest standard. When the reading is stable record the result. Repeat the step above for all subsequent standards proceeding from lowest to highest.
⑤ Your meter is now calibrated. If using a mV meter plot your calibration curve of mV vs Log of Concentration.
⑥ Rinse the electrodes in deionised water and blot dry. Place the electrode in the sample and record the result. If you are not using an ION meter record the mV value and using the calibration curve determine the unknown sample concentration.

For information on which reference electrode is suitable for your application, please scan the QR Code below:

For more advice, application methods or further information on this product
please go to www.edt.co.uk or contact is on info@edt.co.uk