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 electrode is thoroughly rinsed with deionised water. It is worth performing this rinse twice given the possibility of carryover being greatest in high concentration solutions.

Prepare standards by serial dilution.

Make sure your electrode is conditioned by leaving the tip in the lowest concentration standard for 1 hour prior to analysis.

Methods of Analysis.
Direct Potentiometry is described above. This method is simplified by using a direct reading ion meter. 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.
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.
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.

1227 - Cupric ISE

Overall length	155 mm
Body Diameter	12 mm
Cap Diameter	16mm
Connector	BNC
Cable length	1000 mm
Resistance at 25°C	< 2.5 Meg Ohm
Concentration Range	0.4 to 64,000 ppm
Slope	23 to 29 mV/decade
Potential Drift	2 mV per day
Operating pH range	2 to 7
Temperature range	5 to 50°C
Endpoint time	Typically 30 to 60 seconds
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 ISE

The EDT directION ion selective electrode has a solid-state crystalline membrane. A separate reference is required. The electrode is designed for the detection and analysis of divalent copper ions in aqueous solutions and is suitable for use in the field in the laboratory and in on line analysers.

Installation

Fill reference according to instructions and connect to the reference input on the meter.

Connect the ISE to the mV or ion meter. Remove the black protective cap and keep it in a safe place.

The ISE can be used immediately but pre soaking for 5 minutes in a 100ppm Cupric solution 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 . Potassium Nitrate is ideal A typical addition would be 1 ml of 4M ISAB to 50 ml of standard and sample. For low level measurements below around 50 ppm in relatively pure samples no ISAB is needed.

No temperature correction is necessary however standards and samples should be 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 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, rinse with deionised water and immerse the tip in a 1000ppm Cupric solution for 1 hour.

Tips For Successful Analysis.
EDT directION ISE's can be used with any pH/mV meter or Ion meter. If the meter does not have a BNC socket and you have a BNC electrode please contact your EDT directION distributor who will arrange to have the correct plug fitted. Adapters are also available if the same electrode has to be used on more than one meter.

Meters with a 0.1 mV resolution are recommended whilst dedicated Ion meters will provide direct concentration readouts saving time and effort in constructing calibration curves and performing calculations. Your EDT directION distributor can advise on the most suitable meter.

Magnetic stirrer/stirrer bars are recommended for laboratory analysis. Please operate at the lowest constant speed available.

Semi-logarithmic (4-cycle) graph paper is required for preparing calibration curves when you are using a mV meter.

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. Used for preparation of Standards. (Prepared by customer)

ISAB. Used to adjust the Ionic strength of all standards and samples. Typical addition is 1 ml of   ISAB to 50ml of all standards and samples.

Operation

❶ Connect the electrodes to the meter being used for analysis.

❷ Prepare a series (at least 2) of 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.

❸ Dispense 50 ml of each standard into analytically clean beakers. (100 to 150 ml size is perfect)

❹ Add ISAB in the appropriate ratio. As a guide with sample concentrations in the 1 to 1000 ppm range 1ml of a 4 Molar ISAB to 50 ml sample is satisfactory.

❺ 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 mV value.

❻ Repeat step ❺ for all subsequent standards proceeding from lowest to highest.

❼ Plot a calibration curve on semi log paper using mV values on the linear Axis and concentration on the log scale.

❽ Rinse the electrodes in deionised water and blot dry. Place the electrodes in the sample and record the stable mV value.

❾ Using the calibration curve determine the unknown sample concentration.

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