

MEASUREMENT OF CHLORIDE CONCENTRATION IN WATER

A method for the measurement of chloride ion in drinking water, ground water and waste water in samples containing 1 to 1000 ppm chloride. This range may be extended by dilution of an appropriate aliquot.

Equipment Required

1. EDtdirectION DR359TX Ion Meter or pH meter with millivolt scale
2. EDT directION Chloride Combination ion selective electrode (3261)

Reagents:

Ionic Strength Adjustment Buffer (ISAB)

Dissolve 15.1g of reagent grade sodium bromate in 800 ml of water. Add 75 ml of concentrated nitric acid (HNO₃, sp. gr 1.42) and stir well. Dilute with water to 1 litre. Store ISAB in a polyethylene or glass container.

CAUTION: Sodium bromate is a strong oxidant and should be handled appropriately. Also note that preparation and dilutions of ISAB should be made in a well ventilated area, preferably a hood.

Chloride Stock Solution (1000 ppm)

Dissolve 1.648g sodium chloride (dried for .1 hour at 600°C), in water in a volumetric flask and dilute to 1000 ml.

Reference Electrode Outer Fill Solution

Dilute one volume of ISAB with one volume of distilled water.

Standard Preparation

Prepare standards of 100, 10 and 1 ppm by serial dilution of the 1000 ppm stock solution. Mix equal volumes of each standard and the ISAB.

Sample Preparation

Mix equal volumes of sample and ISAB.

Method

Immerse the electrode in each of the standards in increasing concentration steps, rinsing the electrodes with distilled water between standards, and record the mV response of the electrodes. Plot a graph on lin/log paper (available on www.edt.co.uk) mV response against standard concentration.

Immerse the electrodes in the sample solution, record the mV response and plot sample concentration from the graph.

This determination may be carried out directly in concentration units by use of the "Concentration" modes on EDT directION pH/ion analysers.

Calculations

As both standards and sample have been diluted by the same amount the result obtained from the graph is the concentration of the original sample.

Interferences

There is no interference from up to 500 ppm S²⁻, 1000 ppm Br⁻ or I⁻ a 100:1 excess of CN⁻ over Cl⁻, or from 1000 ppm NH₄⁺