

Technical Specifications for the Chloride Ion-Selective Electrode ELIT 8261

Introduction

The Chloride Ion-Selective Electrode has a solid-state poly-crystalline membrane. The electrode is designed for the detection of chloride ions (Cl^-) in aqueous solutions and is suitable for use in both field and laboratory applications. The Chloride Ion is a monovalent anion. One mole of (Cl^-) has a mass of 35.453 grams; 1000 ppm is 0.028M
Dissolve 1.649g anhydrous NaCl in 1 litre de-ionised water.

Physical Specifications

Length of body excl. gold contact	130 mm
Length of body incl. gold contact	140 mm
Diameter of body	8 mm
DC resistance at 25° C	< 0.5 MOhm
Minimum feasible sample volume	5 ml

Chemical / Operational Specifications

Preconditioning / standard solution (But see General Operating Instructions)	Normally 1000 ppm Cl^- as NaCl
Preconditioning time	5 minutes
Optimal pH range	pH 1 to pH 12
Temperature range	0 to 80° C
Recommended ISAB	5M NaNO_3 (add 2% v/v)
Recommended reference electrode	Double junction (ELIT 003)
Reference electrode outer filling solution	0.1M CH_3COOLi
Electrode slope at 25° C	54 ± 5 mV/ decade
Concentration range	1 to 35,000 ppm (3×10^{-5} to 1 Molar)
Response time	< 10 seconds
<i>(Defined as time to complete 90% of the change in potential after immersion in the new solution.)</i>	
Potential drift (in 1000 ppm)	< 3 mV/ day (8 hours)
<i>(Measured at constant temperature and with ISE and Reference Electrode continually immersed)</i>	

Analytical Note: Best results obtained in still (un-stirred) solutions.

Interference:

NB: Because of the much greater solubility of AgCl compared to AgI, the Chloride electrode will be irreversibly damaged if immersed in solutions containing high concentrations of Iodide ions, and even at low concentrations there is a strong interference from I: i.e. the Cl membrane is far more sensitive to I than to Cl. Also note that all poly-crystalline membranes contain Silver Sulphide and thus will not give reliable readings if there are any Ag or S ions present in the solution. There is also a high interference from Bromide and Cyanide. Thus the Chloride electrode will only give reliable results if I, Br, CN, S, Ag are absent, or only present in insignificant amounts compared to the Chloride ion.

If samples are likely to contain significant quantities of these ions, then their effect may be reduced by mixing samples and standards 1:1 with a sodium bromate buffer. This is made by dissolving 15.1 g sodium bromate in 800 ml water and adding 75ml of concentrated nitric acid. This must be stirred well and diluted to 1000 ml with water. Note that this is a strong oxidising solution which should be handled carefully and prepared and used in a well ventilated area since it may liberate Bromine gas. This buffer should remove up to 1000ppm of Bromide or Iodide and 500ppm Sulphide. Small quantities of Cyanide should also be oxidised – **but do not add this acid solution to samples with significant cyanide content** because of the danger of liberating lethal HCN gas.

For more information, see: www.nico2000.net.