Technical Specifications for the Barium Ion-Selective Electrode
ELIT 8081

Introduction

The Barium Ion-Selective Electrode has a solid-state PVC polymer matrix membrane. The electrode is designed for the detection of barium ions **(Ba^{+2})** in aqueous solutions and is suitable for use in both field and laboratory applications.

The Barium Ion is a divalent cation . One mole of (Ba^{+2}) is 137.327 grams; 1000 ppm is 0.007 M
Dissolve 1.779g Barium Chloride di-hydrate (BaCl2.2H2O) in 1 litre deionised 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	< 2.5 MOhm

Chemical / Operational Specifications

Preconditioning / Standard solution	Normally 1000 ppm Ba^{+2} as BaCl2
(But see General Operating Instructions)	
Preconditioning time	at least 5 minutes
Optimal pH range	pH 3 to pH 10
Temperature range	0 to 50° C
Recommended ISAB	NONE - Use Standard Addition Method
Recommended reference electrode	Single junction AgCl **(ELIT 001)**
Electrode slope at 25°C	21 ±3 mV/decade
Concentration range	0.5 to 13,700 ppm (4x10-6 to 0.1 Molar)
Response time	< 10 seconds

(Defined as time to complete 90% of the change in potential after immersion in the new solution.)

Potential drift (*in 1000 ppm*)	< 3 mV/ day (8 hours)

(Measured at constant temperature and with ISE and Reference Electrode continually immersed)

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

Interference:

The following ions cause interference to the Barium measurement (selectivity coefficients (SC) in brackets): Strontium (0.09), Potassium (0.02), Sodium (0.02), Magnesium (0.006), Ammonium (0.003), Calcium (0.002), Lithium (0.002).

The SC is the approximate apparent increase in the measured concentration caused by 1 unit of the interferent. Thus the likely effect of any interfering ion (% increase) can be calculated as follows:

((expected concentration) x (SC) / (expected Ba concentration)) x 100.

Strontium has the highest interference but is unlikely to be present in significant concentrations in most samples. Any Potassium or Sodium ions present will cause a significant positive error if they have concentrations of greater than ten times that of the Barium. Magnesium can be tolerated up to about twenty times the Barium, and Calcium & Lithium up to about fifty times.

For more information see: www.nico2000.net.