ISE DATASHEET

Cadmium Ion

ELIT 8241 · ELIT Ion Selective Electrode · Cation

Cd2+

>> View full ion guide: elyxir.co.uk/resources/ions/cadmium

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PHYSICAL SPECIFICATIONS

Body Length	130 mm (excl. contact) / 140 mm (incl.)
Body Diameter	8 mm
DC Resistance (25°C)	< 2.5 MOhm
Min. Sample Volume	5 ml

ELECTRODE SPECIFICATIONS

Electrode Model	ELIT 8241
Ion	Cadmium (Cd^{2+})
Ion Type	Cation
Valence	2
Membrane Type	Solid-state crystal membrane
Molar Mass	112.411 g/mol
1000 ppm equiv.	0.009 M

OPERATIONAL PARAMETERS

Preconditioning	1000 ppm Cadmium standard
Preconditioning Time	Min. 5 minutes
Detection Range	0.1 to 11,000 ppm (9×10^{-7} to 0.1 M)
Electrode Slope	26 ± 3 mV/decade
pH Range	pH 3 to 7
Temperature Range	0 to 80 °C
Response Time	< 10 seconds (90% response)
Potential Drift	< 3 mV/day in 1000 ppm (8 hours)

REAGENTS & STANDARDS

Reference Electrode	Double junction (ELIT 003). Outer filling solution: 0.1M CH_3COOLi.
ISAB / Buffer	5M $NaNO_3$ — Add 2% v/v.
Standard Prep	Dissolve 2.744 g cadmium nitrate tetrahydrate ($Cd(NO_3)_2 \cdot 4H_2O$) in 1 litre deionised water.

TYPICAL APPLICATIONS

- Environmental Monitoring
- Industrial Effluent
- Water Quality Monitoring
- Research

SELECTIVITY COEFFICIENTS (INTERFERENCE DATA)

Interfering Ion	Selectivity Coeff.	Note
Silver (Ag^+) / Sulphide (S^{2-})	very high	All poly-crystalline membranes — unreliable in presence of Ag or S ions.
Copper (Cu^{2+})	very high	Electrode cannot be used in presence of significant copper concentrations.
Mercury (Hg^{2+})	very high	Electrode cannot be used in presence of significant mercury concentrations.
Iron (Fe^{2+})	~10	Causes spuriously high values if Fe > 1/100th of Cd concentration.
Lead (Pb^{2+})	~10	Causes spuriously high values if Pb > 1/100th of Cd concentration.

SC = approximate apparent increase in measured concentration caused by 1 unit of interferent. Error% = ((interferent conc × SC) / target conc) × 100.

CALIBRATION & SAMPLE PREPARATION

Calibrate with 1000, 100, 10, 1, 0.1 ppm Cd solutions. For high ionic strength samples (> 0.001 M) or pH > 7, add 2 ml ISAB to each 100 ml standard.

Low ionic strength, pH < 7: no preparation. High ionic strength or pH > 7: add 2 ml ISAB to 100 ml sample and stir well.

ANALYTICAL NOTES

- Note narrow pH range (3 to 7).
- The ELIT 8241 cannot be used in the presence of significant copper or mercury.
- Divalent cation — slope ~26 mV/decade.

SAFETY & HAZARDS

! Cadmium compounds are toxic and classified as carcinogens. Handle with appropriate PPE and dispose according to local regulations.