ISE DATASHEET

Cyanide Ion

ELIT 8291 · ELIT Ion Selective Electrode · Anion

CN-

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

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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 8291
Ion	Cyanide (CN^-)
Ion Type	Anion
Valence	1
Membrane Type	Solid-state crystal membrane
Molar Mass	26.018 g/mol
1000 ppm equiv.	0.038 M

OPERATIONAL PARAMETERS

Preconditioning	1000 ppm Cyanide standard
Preconditioning Time	Min. 5 minutes
Detection Range	0.03 to 260 ppm (1×10^{-6} to 0.01 M)
Electrode Slope	54 ± 5 mV/decade
pH Range	pH 11 to 13
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	10M NaOH — Add 2% v/v. This is a very caustic solution; handle with care.
Standard Prep	Dissolve 2.503 g anhydrous potassium cyanide (KCN) in 1 litre deionised water. HAZARD: KCN is highly toxic — handle in a fume cupboard with appropriate PPE.

TYPICAL APPLICATIONS

- Industrial Effluent Monitoring
- Mining & Mineral Processing
- Electroplating Industry
- Environmental Monitoring

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.
Iodide (I^-)	1	Equally sensitive to I^- and CN^- — causes ~10% error if I^- is > 1/10th the cyanide 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 200, 20, 2, 0.2 ppm CN solutions. Add 2 ml 10M NaOH ISAB to each 100 ml standard — this ensures correct pH and eliminates risk of toxic HCN fumes.

MANDATORY: add 2 ml NaOH ISAB to 100 ml of every sample before measurement. This keeps pH > 11 and prevents HCN gas liberation.

SPECIAL ANALYTICAL PROCEDURES

Samples Containing Heavy Metal Complexes

Cyanide bound in complex formation with heavy metals is liberated by EDTA displacement. Prepare EDTA solution: dissolve 7.44 g EDTA in 1 litre deionised water. Add 5 ml EDTA to 50 ml of solution and heat to 50 °C for 5 minutes. Immediately add 50 ml 0.2M NaOH and cool. Standards must receive identical treatment.

ANALYTICAL NOTES

- Note narrow and high pH range (11 to 13) — ISAB addition is mandatory, not optional.
- Limited concentration range compared to other ISEs (maximum 260 ppm).
- Always perform cyanide work in a well-ventilated area or fume cupboard.

SAFETY & HAZARDS

! KCN is highly toxic — all work must be performed in a fume cupboard with appropriate PPE.
! NEVER add acid to cyanide-containing samples — risk of generating lethal HCN gas.
! 10M NaOH ISAB is highly caustic — handle with care and eye protection.