ISE DATASHEET

Copper Ion

ELIT 8227 · ELIT Ion Selective Electrode · Cation

Cu2+

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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 8227
Ion	Copper (Cu^{2+})
Ion Type	Cation
Valence	2
Membrane Type	Solid-state crystal membrane
Molar Mass	63.546 g/mol
1000 ppm equiv.	0.016 M

OPERATIONAL PARAMETERS

Preconditioning	1000 ppm Copper standard
Preconditioning Time	Min. 5 minutes
Detection Range	0.006 to 6,400 ppm (9×10^{-8} to 0.1 M)
Electrode Slope	26 ± 3 mV/decade
pH Range	pH 2 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. ISAB should always be added to give a background matrix of ~0.1M $NaNO_3$.
Standard Prep	Dissolve 3.929 g copper sulphate pentahydrate ($CuSO_4 \cdot 5H_2O$) in 1 litre deionised water.

TYPICAL APPLICATIONS

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

SELECTIVITY COEFFICIENTS (INTERFERENCE DATA)

Interfering Ion	Selectivity Coeff.	Note
Silver (Ag^+) / Sulphide (S^{2-})	very high	All poly-crystalline membranes contain Silver Sulphide — unreliable if Ag or S ions present.
Mercury (Hg^{2+})	very high	Can only be tolerated at very low concentrations relative to Cu.
Bromide (Br^-)	>1	Causes significant negative error if present at > one tenth the copper concentration.
Chloride (Cl^-)	>1	Causes significant negative error if present at > one tenth the copper 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 ppm Cu solutions. Add 2 ml ISAB to each 100 ml standard and sample — the Cu electrode works most reliably with a ~0.1M $NaNO_3$ background matrix.

Add 2 ml of 5M $NaNO_3$ to 100 ml of each sample before measurement. Wash electrodes between samples and allow 2–3 minutes stabilisation after immersion.

ANALYTICAL NOTES

- ISAB addition is mandatory (not just recommended) for the copper electrode to ensure reliable performance.
- Keep pH within 2–7 — outside this range electrode response becomes unreliable.