

# Ammonium Ion

ELIT 8051 · ELIT Ion Selective Electrode · Cation


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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 8051
Ion	Ammonium (NH <sub>4</sub> <sup>+</sup> )
Ion Type	Cation
Valence	1
Membrane Type	Solid-state PVC polymer matrix membrane
Molar Mass	18.038 g/mol
1000 ppm equiv.	0.055 M

## OPERATIONAL PARAMETERS

Preconditioning	1000 ppm Ammonium standard
Preconditioning Time	Min. 5 minutes
Detection Range	0.03 to 1,800 ppm (2×10 <sup>-6</sup> to 0.1 M)
Electrode Slope	54 ± 5 mV/decade
pH Range	pH 0 to 8.5
Temperature Range	0 to 50 °C
Response Time	< 10 seconds (90% response)
Potential Drift	< 3 mV/day in 1000 ppm (8 hours, constant temperature)

## REAGENTS & STANDARDS

Reference Electrode	Double junction lithium acetate (ELIT 003n). Outer filling: 0.1M CH <sub>3</sub> COOLi.
ISAB / Buffer	1M CuSO <sub>4</sub> (add 10% v/v). Use 1M MgSO <sub>4</sub> for NH <sub>4</sub> concentrations above 50 ppm.
Standard Prep	Dissolve 2.965 g anhydrous ammonium chloride (NH <sub>4</sub> Cl) in 1 litre deionised water. Dry NH <sub>4</sub> Cl for 1 hour at 100 °C and cool in a desiccator before use for highest accuracy.

## TYPICAL APPLICATIONS

- Water Quality Monitoring
- Aquaculture
- Agriculture & Soil Analysis
- Environmental Monitoring
- Food & Beverage
- Industrial Effluent

## SELECTIVITY COEFFICIENTS (INTERFERENCE DATA)

Interfering Ion	Selectivity Coeff.	Note
Potassium (K <sup>+</sup> )	0.1	Primary interferent — special correction required if K/NH <sub>4</sub> ratio > 0.5
Sodium (Na <sup>+</sup> )	0.002	
Magnesium (Mg <sup>2+</sup> )	0.0002	0.1M MgSO <sub>4</sub> ISAB can give apparent NH <sub>4</sub> signal up to 2 ppm — use CuSO <sub>4</sub> for samples < 50 ppm
Calcium (Ca <sup>2+</sup> )	0.00006	
Lithium (Li <sup>+</sup> )	0.00003	

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

## CALIBRATION & SAMPLE PREPARATION

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Calibrate with serial dilutions from 1000 ppm stock: 1000, 100, 10, 1, 0.1 ppm  $\text{NH}_4^+$ . For ionic strength > 0.01 M, add 10 ml ISAB per 100 ml standard. Note: ISAB addition raises slope, raises lower detection limit, and lowers pH.

Low ionic strength: immerse electrodes directly in 50-100 ml sample. High ionic strength: add 10 ml ISAB to 100 ml sample and stir well.

## SPECIAL ANALYTICAL PROCEDURES

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### Samples with High Potassium Content ( $\text{K}/\text{NH}_4 > 0.5$ )

Measure  $\text{NH}_4^+$  and K in a representative sample. Add additional K to double the concentration and remeasure apparent  $\text{NH}_4^+$ . Calculate selectivity coefficient from the increase. Alternatively, spike all standards with the same K concentration as the samples.

### pH and Temperature Relationship

In aqueous solution there is a pH-dependent equilibrium between  $\text{NH}_4^+$  and  $\text{NH}_3$ . Below pH 6.5 there is essentially 100%  $\text{NH}_4^+$ ; above pH 11.5 essentially 100%  $\text{NH}_3$ . For Total Ammonia Nitrogen (TAN), keep pH below 7. For dissolved  $\text{NH}_3$  toxicity, measure pH and temperature of each sample to calculate the  $\text{NH}_4^+/\text{NH}_3$  ratio.

## ANALYTICAL NOTES

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- The ELIT ammonium electrode measures  $\text{NH}_4^+$  directly — no alkaline pre-treatment or liberation of ammonia gas is required.
- Stir solutions gently during measurement; allow 2-3 minutes stabilisation after electrode immersion.
- For highest precision, recalibrate frequently.
- 1000 ppm standard is stable for extended periods; dilute working standards should be freshly prepared.

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