

Supelco®

1.14750.0002

MQuant®

Ammonium Test

NH₄⁺

1. Method

Determination with color-disk comparator

Ammonium nitrogen (NH₄-N) occurs partly in the form of ammonium ions and partly as ammonia. A pH-dependent equilibrium exists between the two forms.

In strongly alkaline solution ammonium nitrogen is present almost entirely as ammonia, which reacts with a chlorinating agent to form monochloramine. This in turn reacts with thymol to form a blue indophenol derivative. Due to the intrinsic yellow coloration of the reagent blank, the measurement solution is yellow-green to green in color. The ammonium concentration is measured **semiquantitatively** by visual comparison of the color of the measurement solution with the color fields of a color disk.

2. Measuring range and number of determinations

Measuring range / color-scale graduation ¹⁾	Number of determinations
0.2 - 0.5 - 0.8 - 1.3 - 2.0 - 3.0 - 4.5 - 6.0 - 8.0 mg/l NH ₄ ⁺	200
0.16 - 0.4 - 0.6 - 1.0 - 1.6 - 2.3 - 3.5 - 4.7 - 6.2 mg/l NH ₄ -N	

¹⁾ for conversion factors see section 8

3. Applications

This test measures both ammonium ions and dissolved ammonia.

Sample material:

Groundwater and surface water
Drinking water and mineral water
Aquarium water, waters from aquaculture
Boiler and boiler feed water, cooling water
Process water
Wastewater
Electroplating wastewater
Swimming-pool water
Nutrient solutions for fertilization
Food after appropriate sample pretreatment
This test is **not suited** for seawater.

4. Influence of foreign substances

This was checked individually in solutions containing 3 and 0 mg/l NH₄⁺. The determination is not yet interfered with up to the concentrations of foreign substances given in the table. Cumulative effects were not checked; such effects can, however, not be excluded.

Concentrations of foreign substances in mg/l or %			
Al ³⁺	1000	Mg ²⁺	100
Ca ²⁺	1000	Mn ²⁺	10
Cd ²⁺	1000	Ni ²⁺	100
CN ⁻	1	NO ₂ ⁻	100
Cr ³⁺	100	Pb ²⁺	1000
Cr ₂ O ₇ ²⁻	1000	PO ₄ ³⁻	1000
Cu ²⁺	10	S ²⁻	10
F ⁻	100	SiO ₃ ²⁻	1000
Fe ³⁺	100	Zn ²⁺	100
Hg ²⁺	100		
		EDTA	500
		Primary amines ¹⁾	0
		Secondary amines ²⁾	0
		Na-acetate	10 %
		NaCl	10 %
		NaNO ₃	20 %
		Na ₂ SO ₄	20 %

Reducing agents interfere with the determination.

¹⁾ tested with methylamine

²⁾ tested with dimethylamine

5. Reagents and auxiliaries

Please note the warnings on the packaging materials!

The test reagents are stable up to the date stated on the pack when stored closed at +15 to +25 °C.

Package contents:

1 bottle of reagent NH₄-1
1 bottle of reagent NH₄-2
1 bottle of reagent NH₄-3
1 graduated 5-ml plastic syringe
1 graduated 1-ml plastic syringe
2 test tubes with screw caps
1 color-disk comparator

Other reagents and accessories:

MQuant® Universal indicator strips pH 0 - 14, Cat. No. 109535
Sodium hydroxide solution 1 mol/l Titripur®, Cat. No. 109137
Sulfuric acid 0.5 mol/l Titripur®, Cat. No. 109072
Ammonium standard solution Certipur®, 1000 mg/l NH₄⁺, Cat. No. 119812

MQuant® Flat-bottomed tubes with screw caps for MQuant® tests with color-disk comparator (12 pcs), Cat. No. 117988

6. Preparation

- Analyze immediately after sampling.
- The pH must be within the range 4 - 13.**
Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.
- Filter strongly turbid samples.

7. Procedure

	Measurement sample right-hand tube (A) behind the color disk	Blank left-hand tube (B) behind the color disk	
Pretreated sample (20 - 30 °C)	5 ml	5 ml	Inject into the test tube with the syringe.
Reagent NH ₄ -1	0.4 ml	-	Add with the syringe, close the tube, and mix.
Reagent NH ₄ -2	1 level blue microspoon (in the cap of the NH ₄ -2 bottle)	-	Add, close the tube, and shake vigorously until the reagent is completely dissolved.

Leave to stand for 5 min (reaction time 1).

Reagent NH ₄ -3	4 drops ¹⁾	-	Add, close the tube, and mix.
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Leave to stand for exactly 7 min (reaction time 2).

Hold the comparator to the light, keeping it upright, and rotate the disk until the closest possible color match is achieved between the two large windows.
Read off the result in mg/l NH₄⁺ shown in the small window.

¹⁾ Hold the bottle vertically while adding the reagent!

Notes on the measurement:

- The color of the measurement solution remains stable for only a short time after the end of the reaction time 2 stated above.**
- Turbidity in the measurement solution makes the color comparison more difficult.
- If the color of the measurement solution is equal to or more intense than the darkest color on the scale, repeat the measurement using **fresh**, diluted samples until a value of less than 8.0 mg/l NH₄⁺ is obtained.
- In the event of ammonium concentrations exceeding 100 mg/l, other reaction products are formed and false-low readings are yielded. In such cases it is advisable to conduct a plausibility check of the measurement results by diluting the sample (1:10, 1:100).
- Concerning the result of the analysis, the dilution must be taken into account:

Result of analysis = measurement value x dilution factor

8. Conversions

Units required	=	units given	x	conversion factor
mg/l NH ₄ -N		mg/l NH ₄ ⁺		0.776
mg/l NH ₄ ⁺		mg/l NH ₄ -N		1.29

9. Method control

To check test reagents, measurement device, and handling:
Dilute the ammonium standard solution with distilled water to 3.0 mg/l NH₄⁺ and analyze as described in section 7.
Additional notes see under **www.qa-test-kits.com**.

10. Notes

- Reclose the reagent bottles immediately after use.
- Rinse the test tubes and the syringes **with distilled water only**.
- Information on disposal can be obtained at www.disposal-test-kits.com.**

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