

1.14423.0002

MColorTest™

## Ammonium Test

NH<sub>4</sub><sup>+</sup>

## 1. Method

## Determination with color-card comparator

Ammonium nitrogen (NH<sub>4</sub>-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 card.

## 2. Measuring range and number of determinations

Measuring range / color-scale graduation <sup>1)</sup>	Number of determinations
0.2 - 0.5 - 0.8 - 1.2 - 1.6 - 2 - 3 - 5 - 8 mg/l NH <sub>4</sub> <sup>+</sup>	200
0.16 - 0.4 - 0.6 - 0.9 - 1.2 - 1.6 - 2.3 - 3.9 - 6.2 mg/l NH <sub>4</sub> -N	

<sup>1)</sup> 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 in solutions containing 3 and 0 mg/l NH<sub>4</sub><sup>+</sup>. The determination is not yet interfered with up to the concentrations of foreign substances given in the table.

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

Reducing agents interfere with the determination.

<sup>1)</sup> tested with methylamine

<sup>2)</sup> 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 NH<sub>4</sub>-1  
1 bottle of reagent NH<sub>4</sub>-2  
1 bottle of reagent NH<sub>4</sub>-3  
1 graduated 1-ml plastic syringe  
1 graduated 5-ml plastic syringe  
2 test tubes with screw caps (in comparator block)  
1 color card

## Other reagents and accessories:

MColorpHast™ 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 NH<sub>4</sub><sup>+</sup>, Cat. No. 119812

## Refill pack:

Cat. No. 118455

Ammonium Test

Refill pack for 114750 and 114423

(Reagents without technical accessories for the number of determinations stated in section 2)

## 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 turbid samples.

## 7. Procedure

Open the box and set up with both test tubes <b>on the left</b> .			
Slide the comparator block all the way to the left, so that the end holding the test tubes protrudes laterally over the bottom part of the box.			
Unfold the color card and insert it, colored end first, into the slit at the lower <b>right-hand</b> edge of the box.			
	Measurement sample tube nearer to the tester (A)	Blank tube farther from the tester (B)	
Pretreated sample (20 - 30 °C)	5 ml	5 ml	Inject into the test tube with the syringe.
Reagent NH <sub>4</sub> -1	0.4 ml	-	Add with the syringe, close the tube, and mix.
Reagent NH <sub>4</sub> -2	1 level blue microspoon (in the cap of the NH <sub>4</sub> -2 bottle)	-	Add, close the tube, and shake <b>vigorously until the reagent is completely dissolved</b> .
<b>Leave to stand for 5 min (reaction time 1).</b>			
Reagent NH <sub>4</sub> -3	4 drops <sup>1)</sup>	-	Add, close the tube, and mix.
<b>Leave to stand for exactly 7 min (reaction time 2).</b>			
Slide the color card through to the left until the closest possible color match is achieved between the two open test tubes when viewed from above.			
Read off the result in mg/l NH <sub>4</sub> <sup>+</sup> or NH <sub>4</sub> -N from the color card at the lower right-hand edge of the comparator block within the bottom part of the box.			

<sup>1)</sup> Hold the bottle vertically while adding the reagent!

## Notes on the measurement:

- Ammonium-free samples turn yellow on addition of reagents NH<sub>4</sub>-1, NH<sub>4</sub>-2, and NH<sub>4</sub>-3.
- 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 mg/l NH<sub>4</sub><sup>+</sup> 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:

$$\text{Result of analysis} = \text{measurement value} \times \text{dilution factor}$$

## 8. Conversions

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

## 9. Method control

To check test reagents, measurement device, and handling:  
Dilute the ammonium standard solution with distilled water to 3 mg/l NH<sub>4</sub><sup>+</sup> and analyze as described in section 7.  
Additional notes see under [www.qa-test-kits.com](http://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](http://www.disposal-test-kits.com).**

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Tel. +49(0)6151 72-2440  
[www.analytical-test-kits.com](http://www.analytical-test-kits.com)

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