

1.11117.0001

1.11117.0007

MQuant®

## Ammonium Test

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

## 1. Method

**Colorimetric determination with color card and sliding 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.

Ammonium ions react with Nebler's reagent to form a yellow-brown compound. 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
0.5- 1 - 2 - 3 - 5 - 7 - 10 mg/l NH <sub>4</sub> <sup>+</sup>	150
0.4-0.8-1.6-2.3-3.9-5.4-7.8 mg/l NH <sub>4</sub> -N	

<sup>1)</sup> for conversion factors see section 8

## 3. Applications

## Sample material:

Groundwater and surface water, seawater  
Drinking water  
Waters from aquaculture  
Aquarium water (freshwater and seawater)  
Boiler and boiler feed water, cooling water  
Industrial and process water  
Wastewater  
Swimming-pool water

## 4. Influence of foreign substances

The concentrations of foreign substances usually present in the sample materials stated above lie below the limit at which the determination is interfered with.  
Amines are measured at the same time.

## 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 5-ml plastic syringe  
2 test tubes with screw caps  
1 sliding comparator  
1 color card, usable for Cat. Nos. 1.11117.0001 and 1.11117.0007

## Other reagents and accessories:

MQuant® Universal indicator strips pH 0 - 14, Cat. No. 1.09535  
Sodium hydroxide solution 1 mol/l Titipur®, Cat. No. 1.09137  
Sulfuric acid 0.5 mol/l Titipur®, Cat. No. 1.09072  
Ammonium standard solution Certipur®, 1000 mg/l NH<sub>4</sub><sup>+</sup>, Cat. No. 1.19812

MQuant® Flat-bottomed tubes with screw caps for titrimetric and colorimetric MQuant® tests (12 pcs), Cat. No. 1.14902

## 6. Preparation

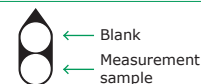
- The pH must be within the range 2 - 12.  
Adjust, if necessary, with sodium hydroxide solution or sulfuric acid.
- Filter turbid samples.

## 7. Procedure

Rinse both test tubes several times with the pretreated sample.

	Measurement sample	Blank	
Pretreated sample (15 - 25 °C)	5 ml	5 ml	Inject into the test tube with the syringe.
Reagent NH <sub>4</sub> -1	3 drops <sup>1)</sup>	-	Add and mix.
Reagent NH <sub>4</sub> -2	3 drops <sup>1)</sup>	-	Add and mix.
Reagent NH <sub>4</sub> -3	3 drops <sup>1)</sup>	-	Add and mix.

Insert the test tubes into the sliding comparator as shown in the diagram and place the comparator on the color card as indicated by the latter.



Slide the comparator along the color scale until the closest possible color match is achieved between the two open 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 indicated by the pointed end of the sliding comparator.

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

## Notes on the measurement:

- The measured value indicates the content of "total ammonium". This consists - depending on the pH of the water to be tested (**prior** to the addition of the reagents!) - of ammonium ions and free ammonia in the following percentage ratios:

pH	Ammonium ions %	Free ammonia %
6	100	0
7	99	1
8	96	4
9	75	25
10	22	78

Ammonia, which is toxic e.g. for fish, is stable only in alkaline waters (high pH). In acidic waters (pH lower than 7) virtually only ammonium ions are present. **For this reason, the pH of the water to be tested should always be measured additionally to the determination of ammonium.**

- 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 10 mg/l NH<sub>4</sub><sup>+</sup> is obtained.

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 5 mg/l NH<sub>4</sub><sup>+</sup> 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 syringe **with distilled water only**.
- The contents of the test tubes as well as the test reagents must not be run off with the wastewater!**  
Information on disposal can be obtained at **www.disposal-test-kits.com**.

