

Supelco®

1.14414.0001

## MQuant® Copper Test

Cu

### 1. Method

#### Determination with color-card comparator

In an ammoniacal medium copper(II) ions react with cuprizone to form a blue complex. The copper 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	Number of determinations
0.05 - 0.08 - 0.12 - 0.16 - 0.20 - 0.25 - 0.3 - 0.4 - 0.5 mg/l Cu	125

### 3. Applications

This test measures only copper(II) ions. When hydrogen peroxide is added, copper(I) ions are measured at the same time (see section 6).

#### Sample material:

Groundwater, surface water, and seawater  
Drinking water  
Wastewater and percolating water  
Boiler and boiler feed water, cooling water  
Electroplating wastewater  
Food and beverages after appropriate sample pretreatment  
Swimming-pool water

### 4. Influence of foreign substances

This was checked individually in solutions containing 0.25 and 0 mg/l Cu. 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 %					
Ag <sup>+</sup>	100	Fe <sup>3+</sup>	100	S <sup>2-</sup>	0.1
Al <sup>3+</sup>	1000	Hg <sup>2+</sup>	100	SCN <sup>-</sup>	1000
Ca <sup>2+</sup>	100	Mg <sup>2+</sup>	1000	SiO <sub>3</sub> <sup>2-</sup>	100
Cd <sup>2+</sup>	100	Mn <sup>2+</sup>	1000	Sn <sup>2+</sup>	100
CN <sup>-</sup>	0.1	NH <sub>4</sub> <sup>+</sup>	1000	SO <sub>3</sub> <sup>2-</sup>	1000
CO <sub>3</sub> <sup>2-</sup>	1000	Ni <sup>2+</sup>	100	Zn <sup>2+</sup>	100
Cr <sup>3+</sup>	10	NO <sub>2</sub> <sup>-</sup>	1000		
Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>	100	Pb <sup>2+</sup>	100		
F <sup>-</sup>	1000	PO <sub>4</sub> <sup>3-</sup>	1000		
				Ascorbic acid	10
				EDTA	5
				Hydrazine	10
				Surfactants <sup>1)</sup>	5 %
				Na-acetate	20 %
				NaCl	15 %
				NaNO <sub>3</sub>	15 %
				Na <sub>2</sub> SO <sub>4</sub>	15 %

<sup>1)</sup> tested with nonionic, cationic, and anionic surfactants

### 5. Reagents and auxiliaries

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

#### Package contents:

4 bottles of reagent Cu-1  
1 bottle of reagent Cu-2  
2 test tubes with screw caps (in comparator block)  
1 color card

#### Other reagents and accessories:

Nitric acid 65 % for analysis EMSURE®, Cat. No. 100456  
Hydrogen peroxide 30 % H<sub>2</sub>O<sub>2</sub> (Perhydrol®) for analysis EMSURE®, Cat. No. 107209  
MQuant® Universal indicator strips pH 0 - 14, Cat. No. 109535  
MQuant® pH-indicator strips pH 5.0 - 10.0, Cat. No. 109533  
Sodium hydroxide solution 1 mol/l Titripur®, Cat. No. 109137  
Sulfuric acid 0.5 mol/l Titripur®, Cat. No. 109072  
Copper standard solution Certipur®, 1000 mg/l Cu, Cat. No. 119786

MQuant® Flat-bottomed long tubes with screw caps for MQuant® tests with color-card comparator (12 pcs), Cat. No. 114901

#### Refill pack:

Cat. No. 118459

Copper Test

Refill pack for 114765, 114418, and 114414

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

### 6. Preparation

- Analyze immediately after sampling. Otherwise preserve with nitric acid 65 % (1 ml nitric acid per 1 l of sample solution).
- To determine copper(I) ions add a few drops of Perhydrol® to the sample and mix.
- The pH must be within the range 4 - 10.**  
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 **on the left**.

Unfold the color card and insert it, colored end first, into the slit at the lower **right-hand** edge of the box.

	Measurement sample tube nearer to the tester (A)	Blank tube farther from the tester (B)	
Pretreated sample (10 - 30 °C)	20 ml	20 ml	Fill the test tube to the mark (= 20 ml). Add, close the tube, and shake <b>vigorously until the reagent is completely dissolved. The pH must be within the range 7.0 - 9.5.</b> Check with MQuant® pH-indicator strips. Add, close the tube, and mix.
Reagent Cu-1	1 level orange-colored micro-spoon (in the cap of the Cu-1 bottle)	-	
Reagent Cu-2	5 drops <sup>1)</sup>	-	

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

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 Cu from the color card at the lower right-hand edge of the box.

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

#### Notes on the measurement:

- The color of the measurement solution remains stable for at least 30 min after the end of the reaction time stated above. (After 45 min the measurement value would have diminished by 5 %.)
- 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 0.5 mg/l Cu is obtained.
- In the event of copper concentrations exceeding 15 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. Method control

To check test reagents, measurement device, and handling: Dilute the copper standard solution with distilled water to 0.25 mg/l Cu and analyze as described in section 7. Additional notes see under **www.qa-test-kits.com**.

### 9. Notes

- Reclose the reagent bottles immediately after use.
- Rinse the test tubes **with distilled water only**.
- Information on disposal can be obtained at [www.disposal-test-kits.com](http://www.disposal-test-kits.com).**

