Copper VLR PP

M152

2 - 210 μg/L Cu

# **Porphyrine Indicator**

#### Instrument specific information

The test can be performed on the following devices. In addition, the required cuvette and the absorption range of the photometer are indicated.

Instrument Type	Cuvette	λ	Measuring Range
MD 600, MultiDirect	ø 24 mm	430 nm	2 - 210 μg/L Cu
SpectroDirect, XD 7000, XD 7500	ø 24 mm	425 nm	2 - 210 μg/L Cu

#### **Material**

Required material (partly optional):

Reagents	Packaging Unit	Part Number
VARIO Copper, Set F10	1 Set	535140

## **Application List**

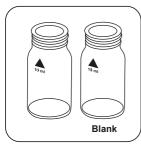
· Waste Water Treatment

#### **Notes**

- 1. For most accurate results, a reagent blank measurement should be performed.
- The pH of the sample has to be adapted by addition of sodium hydroxide solution or salpetric acid to a range 2-6 before starting the measurement.

#### **Determination of Copper VLR with powder packs**

Select the method on the device.



Prepare two clean 24 mm vials. Mark one as a blank.



Place 10 mL sample in each vial.



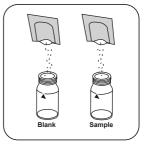
Add a CU3 Masking F10 powder pack to the blank.



Close vial(s).



Swirl around to dissolve the Add a CU1 Porphyrin powder.



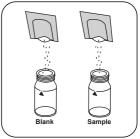
F10 powder pack in each vial.



Close vial(s).



powder.



Swirl around to dissolve the Add a CU2 Porphyrin F10 powder pack in each vial.



Close vial(s).

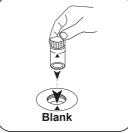


Swirl around to dissolve the Press the ENTER button. powder.





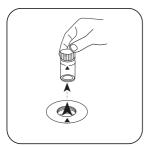
Wait for 3 minute(s) reaction time.



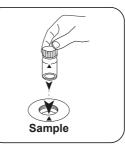
Place blank in the sample chamber. Pay attention to the positioning.



Press the **ZERO** button.



Remove the vial from the sample chamber.



Place sample vial in the sample chamber. Pay attention to the positioning.

**Test** 

Press the TEST button.

The result in  $\mu g/L$  Copper appears on the display.

## **Chemical Method**

Porphyrine Indicator

## Calibration function for 3rd-party photometers

Conc. =  $a + b \cdot Abs + c \cdot Abs^2 + d \cdot Abs^3 + e \cdot Abs^4 + f \cdot Abs^5$ 

	ø 24 mm	□ 10 mm
а	1.6957 • 10+0	1.6957 • 10 <sup>+0</sup>
b	1.5650 • 10+2	3.3647 • 10+2
С		
d		
е		
f		

## Interferences

#### **Persistant Interferences**

1. Complexing substances can interfere in any concentration.

Interference	from / [mg/L]
Al³+	60
Cd <sup>2+</sup>	10
Ca <sup>2+</sup>	15000
Cl <sup>-</sup>	90000
Cr <sup>6+</sup>	110
Co <sup>2+</sup>	100
F-	30000
Pb <sup>2+</sup>	3
Mg <sup>2+</sup>	10000
Mn	140
Мо	11
Ni <sup>2+</sup>	60
K⁺	60000
Na⁺	90000
Zn <sup>2+</sup>	9
Fe	6
Hg	3

## **Method Validation**

Limit of Detection	2.6 μg/L
Limit of Quantification	7.9 µg/L
End of Measuring Range	210 μg/L
Sensitivity	156 μg/L/Abs
Confidence Intervall	5.5 µg/L
Standard Deviation	2.3 μg/L
Variation Coefficient	2.2 %