



Lead

M232

0.01 - 1 mg/L Pb

4-(2-Pyridylazo)-resorcine

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
SpectroDirect, XD 7000, XD 7500	□ 50 mm	520 nm	0.01 - 1 mg/L Pb

Material

Required material (partly optional):

Reagents	Packaging Unit	Part Number
Lead Spectroquant 1.09717.0001 reagent test ^{d)}	50 pc.	420753

Application List

- Waste Water Treatment
- Galvanization

Preparation

1. Before performing the test, you must read through the original instructions and safety advice that is delivered with the test kit (MSDS are available on the home-page of www.merckmillipore.com).
2. With the test process described, only Pb²⁺ ions are determined. To determine colloidal, undissolved and complex-bound lead, digestion is first required.



Notes

1. This method is adapted from MERCK.
2. Spectroquant® is a registered trademark of the company MERCK KGaA.
3. Appropriate safety precautions and good laboratory technique should be used during the whole procedure.
4. Reagents and samples must be metered using a suitable volumetric pipette (class A).
5. To increase the accuracy, it is recommended to perform a reagent blank with deionised water.
6. The data given in the method validation apply when using a 50 mm cuvette.

Variations in the length of the vial can extend the measuring range:

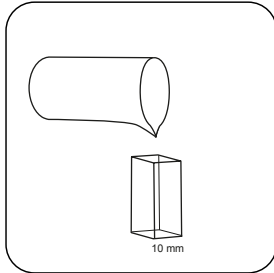
- 10 mm vial: 0.1 mg/L - 1 mg/L, solution: 0.01
- 20 mm vial: 0.05 mg/L - 2.5 mg/L, solution: 0.001
- 50 mm vial: 0.1 mg/L - 5 mg/L, solution: 0.001



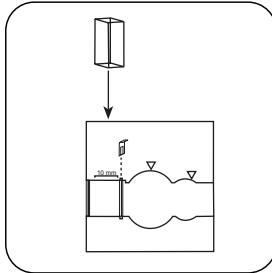
Determination of Lead

Select the method on the device.

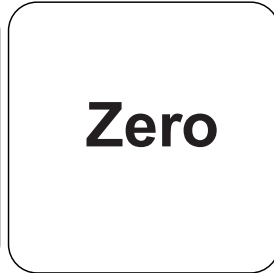
For this method, a ZERO measurement does not have to be carried out every time on the following devices: XD 7000, XD 7500



Fill 10, 20 or 50 mm vial with sample.

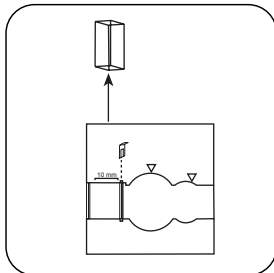


Place sample vial in the sample chamber. • Pay attention to the positioning.

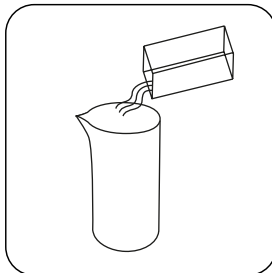


Zero

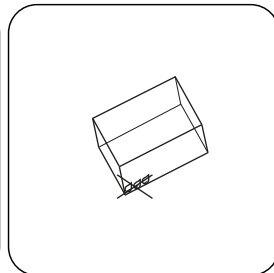
Press the **ZERO** button.



Remove vial from the sample chamber.



Empty vial.

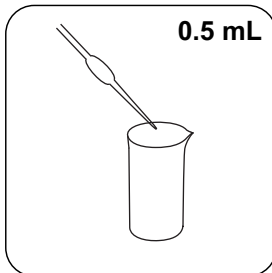


Dry the vial thoroughly.

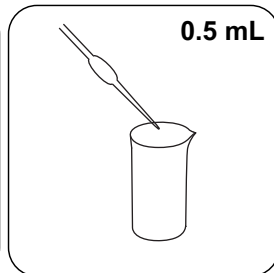
For devices that require **no ZERO measurement**, start here.



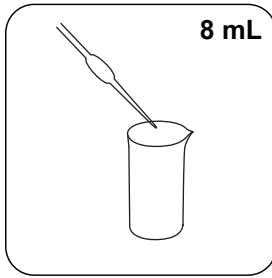
Note! Reagent Pb-1 contains Potassium cyanide! Adhere strictly to the specified dosage sequence!



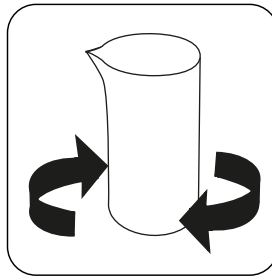
Place **0.5 mL Reagent Pb-1** in a suitable sample vessel.



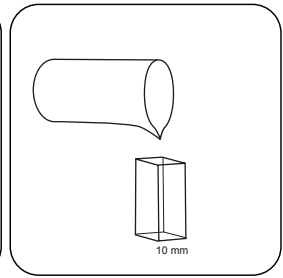
Add **0.5 mL Reagent Pb-2**.



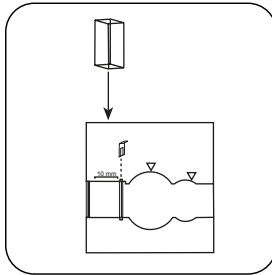
Add **8 mL sample**.



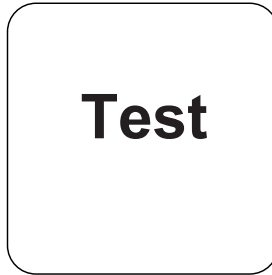
Invert several times to mix the contents.



Fill **10, 20 or 50 mm vial** with **sample**.



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



Press the **TEST** (XD: **START**) button.

The result in mg/L Lead appears on the display.



Chemical Method

4-(2-Pyridylazo-)-resorcin

Appendix

Calibration function for 3rd-party photometers

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

Wavelength: 520 nm

□ 50 mm

a	$0.0000 \cdot 10^0$
b	$1.3518 \cdot 10^{+0}$
c	
d	
e	
f	

Interferences

Interference	from / [mg/L]
Ag	50
Al	500
Ca	250
Cd ²⁺	25
Cr ³⁺	25
Cr ₂ O ₇ ²⁻	10
Cu ²⁺	100
Fe ³⁺	2
Hg ²⁺	50
Mg	250
Mn ²⁺	0,1
NH ₄ ⁺	1000
Ni ²⁺	100
NO ₂ ⁻	1000
PO ₄ ³⁻	50
Zn	25

Interference	from / [mg/L]
EDTA	0,25
Surfactants	500
Na-Ac	0,5
NaCl	0,5
NaNO ₃	0.125
Na ₂ SO ₄	0.375
Total Hardness	30° dH

Method Validation

Limit of Detection	0.006 mg/L
Limit of Quantification	0.017 mg/L
End of Measuring Range	1.0 mg/L
Sensitivity	1.3742 mg/L / Abs
Confidence Intervall	0.044mg/L
Standard Deviation	0.018 mg/L
Variation Coefficient	3.62 %

Bibliography

Shvoeva, O.P., Dedkova, V.P. & Savvin, S.B. Journal of Analytical Chemistry (2001) 56: 1080

° Spectroquant® is a Merck KGaA Trademark