

PACKTEST Lead

INSTRUCTIONS

Model SPK-Pb

Separation and preconcentration of lead by MetaSEP AnaLig[®] and PAR Visual Colorimetric Method

Range : Pb 0~1 mg/L(ppm)

Main reagent : PAR 4-(2-Pyridylazo)resorcinol

Required time : 10 minutes



Danger

Caution

1. PACKTEST Lead allows measuring dissolved lead ions. If you wish to measure total lead concentration including suspended particles, refer to the following section "Measuring of lead including suspended particles".
2. Sample including many suspended particles or precipitation needs filtration.
3. Sample pH \geq 9 adjust under pH7 with diluted Nitric Acid or diluted Hydrochloric Acid excluding Sulfuric Acid. Sample including strong acid more than 10% as Nitric Acid, Hydrochloric Acid and Sulfuric Acid is necessary to dilute fewer than 10%.
4. Following conditions should be avoided passing through the column. Strong oxidizing agents such as aqua regia, H₂O₂ and Cl₂. F⁻, pH \geq 10
5. Sample is required pH \leq 1 passing through the column. If it is pH >1, add more K-1 reagent or 10% of Nitric Acid.
6. Keep sample temperature in the range 15°C - 40°C.
7. K-1 reagent, K-2 reagent, K-3 reagent and sample added K-1 reagent are strong acid. Loose connecting or strong pressure will cause leaks or splash of liquid. Wear eye protector, mask and gloves.
8. Solid deposits under low temperature have no influence to measure.
9. At [Procedure ⑩], shake enough to dissolve the orange reagent.
10. To measure under 0.1mg/L with high accuracy, refer to the following section "Measuring of Under 0.05mg/L of lead".

Measuring of lead including suspended particles

10mL of sample in a heat-resisting beaker with K-1 reagent and boil until suspended particles dissolved. After cooling, pour the sample to the 10mL-cup and add pure water up to 10mL line. Then, start from [Procedure 2.].

Measuring of Under 0.05mg/L of lead

Recommend passing through more volume of sample to the column to measure under 0.05mg/L of Pb²⁺.

Example:

If a sample needs 50mL, add 5mL of R-1 reagent.

Then pass through 50mL of the sample to the column.

To obtain the result, divide the measurement value by 5.







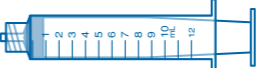

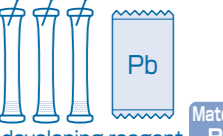


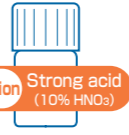


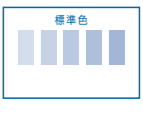
Interferences

Standard colors are determined from Standard Solutions. However, coexisting substances will cause inaccurate results. The list below reports substances concentrations under which ones interferences are insignificant:

- \leq 10000mg/L ... Ascorbic Acid, Citric Acid, Glutamic Acid, Oxalic Acid, Tartaric Acid, Thiourea
- \leq 1000mg/L ... B (III), Ca²⁺, Cl⁻, Mg²⁺, Na⁺, NO₃⁻, Chlorine, EDTA, IDA
- \leq 500mg/L ... K⁺
- \leq 100mg/L ... Ag⁺, Al³⁺, Cr³⁺, Cu²⁺, Fe²⁺, Fe³⁺, Mn²⁺, Mo (VI), Ni²⁺, Sn²⁺, Zn²⁺, Anionic Surfactant, Nonionic Surfactant
- \leq 1mg/L ... Ba²⁺
- \leq 0.5mg/L ... Bi³⁺

Insoluble complexes with CrO₄²⁻, Cr₂O₇²⁻, F⁻, PO₄³⁻ and SO₄²⁻ are not able to measure.

Items & Usage

 Column Quantity:20 Material: PP Usage: Separation and preconcentration of lead (Single-use)	 Connector Quantity:2 Material: PP Usage: Connecting a column and syringes (Useable ten times)	 10mL-Cup Quantity:1 Material: PP Usage: Taking 10mL of a sample	 Cell(PACKTEST Square Cup) Quantity:1 Material: PS Usage: Recovering an eluent	 100mL-Plastic Beaker Quantity:1 Material: PP Usage: Recovering waste liquid	
 1mL-Pipette Quantity:1 Material: PE Usage: Add K-1 reagent	 10mL-Syringe Quantity:1 Material: PP Usage: Load sample to the column	 2.5mL-Syringe Quantity:3 Material: PP Usage: Load K-1,2,3 reagent to the column	 Tube Quantity:20(4 laminated package) Material: PE Usage: Color developing reagent		
 K-1 Reagent Quantity:1 Material: PP Usage: Sample pH adjustment Caution Strong acid (10% HNO ₃)	 K-2 Reagent Quantity:1 Material: PP Usage: Conditioning of the column Caution Strong acid (10% HNO ₃)	 K-3 Reagent Quantity:1 Material: PP Usage: Washing the column Caution Strong acid (10% HNO ₃)	 K-4 Reagent Quantity:1 Material: PP Usage: Eluent	 5mL-Cup Quantity:1 Material: PP Usage: Taking K-4 reagent	 Standard Color Quantity:1 Material: Paper Usage: Detection of lead

Feature

MetaSEP AnaLig[®] is used to concentrate Pb²⁺ from dilute samples and separate Pb²⁺ from interfering substances. Then Pb²⁺ reacts with PAR to form a red colored complex in direct proportion to the Pb²⁺ concentration. It is suitable for wastewater management.

Handling of PACKTEST Before and After use

K-1 reagent, K-2 reagent, K-3 reagent and sample solution after K-1 reagent addition will be Strongly-acidic.

First Aid **Eye contact** → Immediately rinse eyes with water for at least 15 minutes. Seek medical attention.

Skin contact → Immediately flush skin with water.

Enter into mouth → Immediately rinse mouth. Seek medical attention.

If the irritation persists or get worse, please seek medical attention immediately. Especially in case ingested reagents or test solution, drink plenty of water or milk and immediately seek medical attention. Please refer to GHS label on the package.

Storage Use PACKTEST tubes as soon as possible after opening the laminated package.

Disposal Dispose this product in a manner consistent with Federal, State, and local regulations.

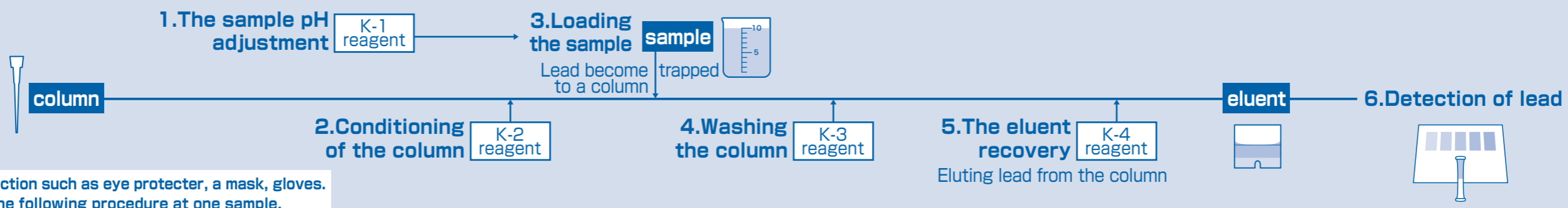


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Please read the back side by all means.

Procedure

Lead is concentrated in a column, then eluted from the column, and detected by colorimetry.



- ※Wear a tool for protection such as eye protector, a mask, gloves.
- ※Please perform all the following procedure at one sample.

1. The sample pH adjustment

- Take exactly 10mL of the sample to 10mL-cup. (Fig.1)
- Use a 1mL-pipette to add 1mL of K-1 reagent. Swirl to mix. (Fig.2)



Fig.1

Fig.2

2. Conditioning of the column

- Use a 2.5mL-syringe to pass through 2 mL of K-2 reagent to the column for 30 seconds.

Caution Strong acid

※ See below "Instruction for details".

3. Loading the sample

- Use a 10mL-syringe to pass through the prepared sample to the conditioned column for 3minutes.

Caution Strong acid

※ See below "Instruction for details".

- Screw out the 10mL-syringe from the connector. Draw air into the 10mL-syringe, and then eject the liquid left in the column. (Fig.3)

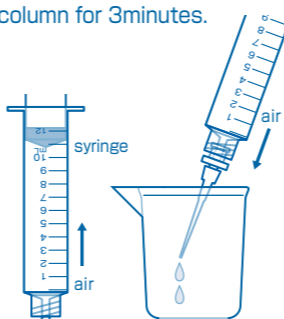


Fig.3

4. Washing the column

- Use another 2.5mL-syringe to pass through 1 mL of K-3 reagent to the column for 20 seconds.

Caution Strong acid

※ See below "Instruction for details".

- Screw out the 2.5mL-syringe from the connector. Draw air into the 2.5mL-syringe, and then eject the liquid left in the column. (Fig.3)

5. The eluent recovery

- Prepare the Cell (PACKTEST Square Cup).

- Take 1.5-2mL of K-4 reagent to 5mL-Cup. (Fig.4)

- Draw air into another 2.5mL-syringe until 1mL line, and then suck up K-4 reagent until 1.5mL line accurately. (Fig.5)

- Pass through the column for 30 seconds and receive the eluent to the cell. (Fig.6)

※ See below "Instruction for details".

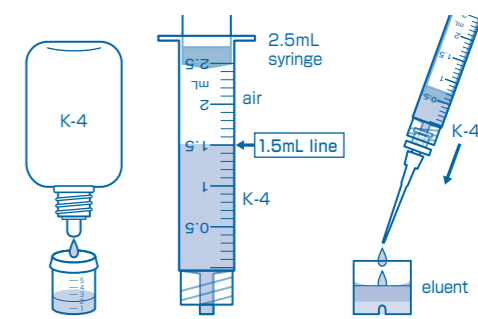


Fig.4

Fig.5

Fig.6

6. Detection of lead

- Open the laminated package. Remove the line to clear the aperture from the top of the tube. (Fig.7)

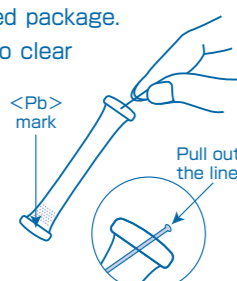


Fig.7

- Press the sides of the tube to expel approximately half of volume. Maintain pressed. (Fig.8)



Fig.8

- Immerse the tube in the cell. Release the side and draw the eluent in the tube. (Fig.9)

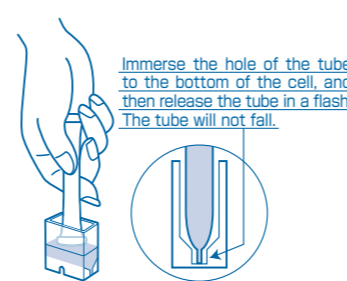


Fig.9

- Shake the tube lightly about 30 times. (Fig.10)

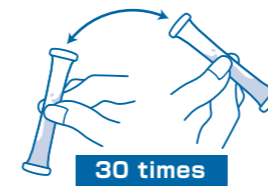


Fig.10

- After 1 minute, compare with the Standard Color. (Fig.11)

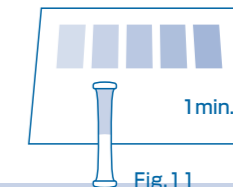


Fig.11

How to read the test

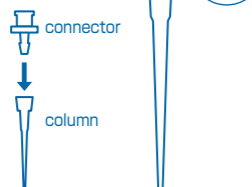
After the reaction time, compare the color of the tube with the Standard Color. The nearest color indicates the measured value of the sample. A color between two standard colors indicates a value between them.

Instruction for details

The main operation of PACKTEST Lead is loading liquid to a column. Repeat procedure of a - e as each reagent and sample.

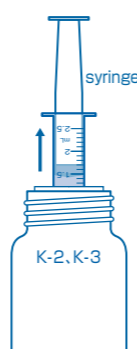
a. Fasten the column to the connector (male) until it makes a clicking sound.

- Loose connecting will cause leaks of liquid.
- Connector is used about 10 times. If it would become leaks, use new one.



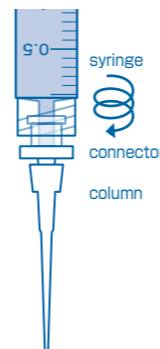
b. Suck up reagents or sample into syringes.

- To prevent contamination of reagents, syringes are rinsed with pure water before use.
- K-2 and K-3 reagents are allowed the approximate volume.
- K-4 reagent is required accurate volume.
- Air doesn't become influence when reagents or sample pass through the column.
- To avoid eye contact, do not measure the volume of liquid with turning up the syringe.



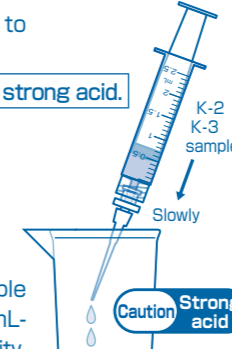
c. Connect syringes with liquid and the connector (female).

- Screw in the syringe to the connector tight.
- Loose connecting will cause leaks or splash of liquid.



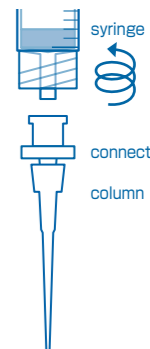
d. Slow flow rate are desirable.

- Do not push syringe by strong pressure to avoid splashing liquid as disconnect.
- Danger, K-2, K-3 reagents and sample are strong acid.**
- Recommended flow rate.
K-2 reagent : over 30seconds,
K-3 reagent : over 20seconds
K-4 reagent : over 30seconds,
sample : over 3 minutes
- Receive the K-2, K-3 reagents and sample flowed through the column to the 100mL-plastic beaker, because they are strong acidity.



e. Screw out the syringe from the connector.

- Do not remove the column and the connector until finish all procedure.
- Column is single-use but connector is not. Do not dispose connector with column.
- Pull the column horizontally from the connector for releasing.
- Rinse the connector with pure water after and before use.



Please read the back side by all means.