Phosphorus

Phosphorus. Phosphomolybdate. UV

Product information

24PHOS01-FLOUR	**Meditest Phosphorus**	**6x40 mL**
24PHOS01-AU	**Meditest Phosphorus**	**6x40 mL**
24PHOS01-AB	**Meditest Phosphorus**	**6x40 mL**
24PHOS01-ER	**Meditest Phosphorus**	**6x40 mL**
24PHOS01-AR	**Meditest Phosphorus**	**6x40 mL**

Purpose

This reagent is designed for the quantitative determination of phosphate concentration in human serum, plasma and urine.

Summary

Phosphorus is an essential mineral for tissue bone formation and is required by every cell in the body for normal function. About 85% of body phosphorus is found in bones and teeth. Low phosphorus levels may be caused by hyper vitaminosis D, primary hyperparathyroidism, renal tubular disorders, antacids, or malabsorption. High phosphorus levels, on the other hand, can be caused by diet, bone metastases, liver disease, alcohol intake, diarrhea, and[vomiting1,5,6]. Clinical diagnosis should not be based on a single test result, but clinical and other laboratory data should be integrated.

Test principle

Direct method for the determination of inorganic phosphate. Inorganic phosphate reacts with ammonium molybdate in acid medium to form a yellow phosphomolybdate complex. The intensity of the resulting color is proportional to the concentration of inorganic phosphorus in the sample[1,2]

Reagents - working solutions

R 1 Buffer	Ammonium molybdate Sulphuric acid (SO4H2) Detergents	0.40 mM 210 mM

Precautions warnings

R: H314-Causes severe skin burns and eye damage. Follow the precautionary declarations given in the MSDS and on the label of the product!

It is intended for in vitro diagnostic use by healthcare professionals. Follow the normal precautions necessary in handling all laboratory reagents.
Infectious or microbial waste:
Warning: handle waste as potentially biohazardous. Dispose of waste according to accepted laboratory instructions and procedures.
Environmental hazards: Follow all relevant local disposal regulations to determine that it has been disposed of safely. If requested, a safety data sheet can be provided to professional users.

Inhibit foam formation in all reagents and sample types (sample, calibrator and control).
If there is any damage on the package, do not use Read the user manual carefully before use, do not use the expired assay kit. Do not mix different lot reagents.

All samples should be considered epidemic material, please dispose of them in accordance with the laboratory working standard of infectious diseases.
Take the necessary protective measures to prevent users from becoming infected during operation.

Use of reagents

Ready to use.

Storage and stability

All components of the kit are stable until the expiration date on the label when stored tightly closed at 2-8ºC, protected from light and contamination is avoided during their use.
Do not use reagents after the expiration date. Signs of reactive deterioration: Presence of particles and turbidity.

Sample collection and preparation

- Serum or plasma1,5: Must not contain haemolysis. Serum or plasma should be removed from the coagul as quickly as possible to prevent elevation of serum phosphorus due to hydrolysis or leakage of phosphate present in erythrocytes.
Stability: 7 days at 2-8ºC
- Urine[1.2] (24 h): Place the sample in a vial containing 10 mL of 10% v/v hydrochloric acid (HCl) to prevent phosphate precipitations. Set to pH 2. Dilute the sample with distilled water in a ratio of 1/10. Mix. Multiply the result by 10 (dilution factor).
Stability: 10 days at 2-8ºC.

Required Materials (not included in the kit)

1. Cat# 24BIO01-DC Meditest Diachem Calibrator
2. Cat# 24BIO01-DQ Meditest Diacheck Control L1
3. Cat# 24BIO02-DQ Meditest Diacheck Control L2
4. General laboratory equipment
5. Distilled or deionized water

Working Procedure

If you are using a spectrophotometer to perform this test, work with the following procedure. Ask your representative for the application data for fully automatic devices.

1.Test Conditions:
Wavelength: . 520 nm
Cuvette: . . . . . 1 cm light path
Temperature: .

2. Adjust the instrument to zero with distilled water.
3. Pipette into a cuvette:

	Blank	Standard	Sample
WR (mL)	1.0	1.0	1.0
Standard[(Note 1,4,5)] (µL)	--	10	--
Sample (µL)	--	--	10

4. Stir and incubate at room temperature for 5 minutes or at 37ºC for 3 minutes.
5. Read the absorbance of the samples and the calibrator (A) against the gap. The color is stable for at least 30 minutes.

Calculation:

$$\text{Serum: } \frac{\text{(A) Sample} - \text{(A) Blank}}{\text{(A) Standard} - \text{(A) Blank}} \times 5 \text{ (Standard conc.)} = \text{mg/dL}$$

$$\text{Urine 24 h: } \frac{\text{(A) Sample} - \text{(A) Blank}}{\text{(A) Standard} - \text{(A) Blank}} \times 5 \times \text{vol.(dL)} = \text{mg/dL urine 24 h}$$

Conversion factor: mg/dL x 0.323 = mmol/L.

Expected values

Serum/plasma:	
Child	4.0 – 7.0 mg/dL ≅ 1.29 – 2.26 mmol/L
Adult	2.5 – 5.0 mg/dL ≅ 0.80 – 1.61 mmol/L
Urine:	
Adult	0.4 – 1.3 g /24 h

These values are for orientation purposes; Each laboratory should establish its own reference range

Limitations

Hemolyzed samples are unacceptable because erythrocytes contain high concentrations of organic phosphate esters, which can be hydrolyzed to inorganic phosphate during storage. Inorganic phosphate increases by 4 to 5 mg/dL per day[5]. A list of drugs and other substances that interact with phosphorus determination has been reported by Young et al.3,4.

Performance characteristics

Measuring range: 0 - 35 mg/dL

If the results obtained are greater than the linearity limit, dilute the sample by 1/2 with 9 g/L NaCl and multiply the result by 2.

Precision

	Intra-assay (n=20)		Inter-assay (n=20)	
Mean (mg/dL)	4,09	7,12	4,11	7,09
SD	0,03	0,046	0,09	0,06
CV (%)	0,62	0,80	2,15	0,80

Sensitivity: 1 mg/dL = 0.0798 Abs.
Accuracy: Results obtained using Meditest reagents (y) did not show systematic differences when compared with other commercial reagents (x). The results obtained using 50 samples are as follows:
Correlation coefficient $(r)^2$: 0.8577
Regression equation: y=0.724x + 0.837

The results of the performance characteristics depend on the analyzer used.

References

1. Farrell E C. Phosphorus. Kaplan A et al. Clin Chem The C.V. Mosby Co. St Louis. Toronto. Princeton 1984; 1072-1074 and 418.
2. Daly J A. et al. Clin Chem 1972; 18 (3): 263-265.
3. Young DS. Effects of drugs on Clinical Lab. Tests, 4th ed AACC Press, 1995.
4. Young DS. Effects of disease on Clinical Lab. Tests, 4th ed. AACC 2001.
5. Burtis A. et al. Tietz Textbook of Clinical Chemistry, 3rd ed. AACC 1999.
6. Tietz N W et al. Clinical Guide to Laboratory Tests, 3rd ed. AACC 1995.

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