OBio...
Supporting Care to Cure
A Division of Orchard Medical

Phosphorus

Order Information

Cat. No.	Kit Configuration
OAR1142	Reagent: 2 x 20 mL Standard: 1 x 2 mL

Summary

Phosphorus is an essential mineral for tissue bone formation and is required by every cell in the body for normal function. Approximately 85% of the body phosphorus is found in bone and in teeth. Low levels of phosphorus can be caused by hypervitaminosis D, primary hyperparathyroidism, renal tubular disorders, antacids or malabsorption. High levels of phosphorus can be caused by diet, bone metastases, liver disease, alcohol ingestion, diarrhoea and vomiting. Clinical diagnosis should not be made on a single test result; it should integrate clinical and other laboratory data.

Method

Photometric UV test with endpoint determination.

Principle

Direct method for determining inorganic phosphate. Inorganic phosphate reacts in acid medium with ammonium molybdate to form a phosphomolybdate complex with yellow color. The intensity of the color formed is proportional to the inorganic phosphorus concentration in the sample.

Reagent Storage Instructions and Stability

The reagent is stable till the date of expiry, if stored at 2° - 8°C, protected from light and contamination is avoided.
Do not freeze the reagents.
Note:Measurement is not influenced by occasionally occurring color changes.

Composition

Reagent: Ammonium molybdate-0.40 mM, Sulphuric acid – 210mM, Detergent
Standard: Phosphorus aqueous standard (5 mg/dL).

Warnings and Precautions

1. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
2. Wear suitable gloves and eye/face protection.
3. Always use safety pipettes to pull the reagents into a pipette.
4. Reagents may contain some non-reactive and preservative components. It is suggested to handle carefully, avoid direct contact with skin and do not swallow.
5. The reagents contain sodium azide (0.95 g/L) as preservative. Do not swallow. Avoid contact with skin and mucous membranes.
6. For professional use only!

Waste Management

Please refer to local legal requirements.

Reagent Preparation

The reagent and the standard are ready to use.

Materials required but not provided

NaCl solution 9 g/L
General laboratory equipment

Specimen

Serum, heparin plasma or EDTA plasma
Stability, Urine: 1 month at 2° – 8 °C,
3 months at -20
°C Only freeze
once!
Discard contaminated specimens.

Assay Procedure

Wavelength	340 nm
Light path	10 mm
Temperature	37°C
Measurement	against Water Blank

	Blank	Sample/Standard/Calibrator
Reagent	1000 µL	1000 µL
Distilled water	10 µL	-
Sample/Standard	-	10 µL
Mix, incubate for 5 min. at 37°C. Read absorbance against the water blank.		

Calculation:

With Standard or Calibrator

$$\text{Phosphorus (mg/dL)} = \frac{\Delta A \text{ Sample}}{\Delta A \text{ Std. /Cal}} \times \text{Conc. of Std. /Cal (mg/dL)}$$

$$\text{Phosphorus (mg/24 h)} = \frac{\Delta A \text{ Sample}}{\Delta A \text{ Std. /Cal}} \times \text{Conc. of Std./Cal (mg/dL)} \times \text{vol. (dL) urine 24 h}$$

Conversion Factor

Phosphorus (mg/dL) x 0.3229 = Phosphorus (mmol/L)

Quality Control

For internal quality normal and abnormal controls should be assayed with each batch of samples.
Each laboratory should establish corrective action in case of deviations in control recovery.

Performance Characteristics Measuring Range

Measuring rang 0.5 to 35 mg/dL. When values exceed 35 mg/dL, the samples should be diluted 1+4 NaCl solution (9 g/L) and the result is multiplied by 5.

Specificity/Interferences

No interference was observed by, Ascorbic acid upto 30 mg/dL and Triglycerides upto 2000 mg/dL.

Sensitivity/Limit of Detection

The lower limit of detection is 0.5 mg/dL.

Linearity

The higher limit of detection is 35 mg/dL.

Precision

Intra assay n = 20	Mean [mg/dL]	SD [mg/dL]	CV [%]
Sample 1	3.54	0.17	4.89
Sample 2	7.35	0.24	3.33

Inter assay n = 20	Mean [mg/dL]	SD [mg/dL]	CV [%]
Sample 1	4.38	0.19	4.31
Sample 2	6.76	0.18	2.71

Method Comparison

A comparison of Nucleus Diagnosys Phosphorus (y) with a commercially available test (x) using 15 samples gave following results:
$y = 0.972x + 0.199$; $r^2 = 0.992$.

Reference Range

Serum or plasma:
Children: **4.0 – 7.0 mg/dL = 1.29 – 2.26 mmol/L**
Adults: **2.5 – 5.0 mg/dL = 0.80 – 1.61 mmol/L**
Urine: Adults: **0.4 – 1.3 g /24 h**

Each laboratory should check if reference ranges are transferable to its own patient population and determine own reference ranges if necessary.

Literature

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