台塑生醫科技股份有限公司
FORMOSA BIOMEDICAL TECHNOLOGY CORP.

PHOSPHORUS TEST PHOS

UV Method

INTENDED USE

For the quantitative determination of inorganic phosphorus in serum.

INSTRUCTIONS AND CLINICAL SIGNIFICANCE

Phosphorus is an abundant element in the body and plays an important role in intermediary metabolism, skeletal formation, dentition and acid-base balance.

The determination of phosphorus are usually performed by two techniques; one measure the phosphomolybedenum blue formation after reduction of molybdophosphoric acid; the other measures the absorbance at 340 nm of the unreduced phosphomolydophosphoric acid; the other measures the absorbance at 340 nm of the unreduced phosphomloybdate. The reagent presented here is the UV method which measure the unreduced phosphomolybdate complex at 340 nm.

PRINCIPLE

$$H_3PO_4 + Mo\ (VI) \xrightarrow{H^+} \text{unreduced phosphomolybdate complex}$$

SPECIMEN COLLECTION AND PREPARATION

Fasting blood should be used since glucose ingestion lowers the inorganic phosphorus level. The determination should be carried out on fresh unhemolyzed serum separated as soon as possible from the red cells. Hemolyzed serum should be avoided since it contains organic phosphorus compounds which may be hydrolyzed and assayed as inorganic phosphorus. If the serum is properly separated, the phosphorus is stable for 1 week when stored refrigerated.

Urine specimen should be acidified to pH 2.0 by concentrated hydrochloric acid, and then diluted 1:10 with distilled water.

REAGENT

Package:	R1:	3×100 ml	Common
		5×60 ml	Hitachi 7170
		5×80 ml	Hitachi 7060
		10×50 ml	Hitachi 7020

2. Components: Phosphorus standard: 1.615 mmol/L(5 mg/dl) Contains molybdate in acidic solution.
   Store all the above reagent at 2~8℃.

PRECAUTIONS

1. For in vitro diagnostic use only.
2. Since all specimens are potentially infectious, they should be handled with appropriate precautions and practices in accordance with Biosafety level 2 as recommended by USA NIH manual Biosafety in Microbiological and Biomedical Laboratories, and in accordance with National or local regulations related to the safety precautions of such materials.
3. Color reagent contains dilute sulfuric acid, it is caustic, avoid contact and do not pipette by mouth.
4. Each laboratory has to perform the quality control test to assure the results being reliable before running the specimen tests.

PROCEDURE

Wavelength: 340 nm; Cuvette: 1 cm light path; Incubation: 37℃.
Measure against reagent blank.

	Blank	Standard	Test
Color reagent ml	1	1	1
Water ml	0.01		
Standard ml		0.01	
Serum ml			0.01
Mix well, leave standing at 37 ℃ water bath for 5 minutes and measure the absorbance at 340 nm against Blank			

***** The Hitachi reagents are used directly on Hitachi analyzers in accordant with Hitachi parameters.

RESULT CALCULATION

$$\text{Phosphorus(mmol/L)} = \frac{\text{Abs. Test}}{\text{Abs. standard}} \times \text{concentration of standard.}$$

EXPECTED VALUES

Adults: Serum 2.5-4.8 mg/dl; Urine 0.4-1.5 g/24hr.
Children: Serum 4.0-7.0 mg/dl; Urine 0.5-0.85 g /24hr.
* SI units (mmol/L) = mg/dl ×0.3333
It is generally recommended that each laboratory establish its own range of normal values for commonly performed tests.

PERFORMANCE

Linearity: 4.67 mmol/L (14 mg/dl)
Specificity: A change of absorbance of 0.001 corresponds to 0.003 mmol/L (0.01 mg/dl) of phosphorus.
Precision:

	Within run		Between run	
Samples	Level Ⅰ	Level Ⅱ	Level Ⅰ	Level Ⅱ
Number n	20	20	20	20
Mean mmol/L	1.2	2.2	1.3	2.0
SD mmol/L	0.0287	0.0518	0.0302	0.0607
CV %	2.6	2.4	2.3	2.6

REFERENCES

1. Goldenberg H, Fernandez A, Clin. Chem., 12:871, 1966.
2. Young DS, Thomas DW, Frideman RB, Pestaner LG, Clin. Chem., 18: No. 10, 1972.
3. Weissman N. Pileggi VJ, Clin, Chem., Principle and Technics, p.726, Harper and Row, Hagerstown, MD.