

Inorganic Phosphorus Reagent

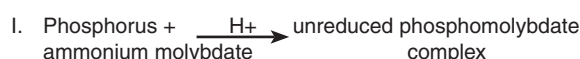
INTENDED USE

For the quantitative determination of Inorganic Phosphorus in serum.

SUMMARY

Phosphorus is present in the blood as inorganic phosphate and organic phosphate. Nearly all the organic phosphate is found in the red cells, and inorganic phosphate is found in the serum. Inorganic phosphate in serum is reported as inorganic phosphorus, and its measurement is useful in evaluating kidney, parathyroid, and bone diseases including metastatic malignancy. It may also be of value in vitamin D and growth disorders. The normal range for children is higher than for adults, because of their rapid growth.^{1,2}

METHODOLOGY



Inorganic phosphorus reacts with molybdate in the presence of an acid to form an ammonium phosphomolybdate complex.³ This complex is maintained in solution and its absorbance is enhanced by the addition of surfactant. The increase in color is measured spectrophotometrically and is proportional to the amount of inorganic phosphorus present.

REAGENTS

Reactive Ingredients

I. PHOSPHORUS ACID (R1)	
ammonium molybdate	0.38 mmol/L
surfactant	
I. PHOSPHORUS (R2)	
ammonium molybdate	0.94 mmol/L
surfactant	

Precautions

1. For in vitro diagnostic use.
2. R1 contains strong acid. Avoid ingestion or contact with eyes, skin or clothing. In case of contact, immediately flush skin or eyes with water and seek medical attention.

Preparation

1. Phosphorus Reagents are ready to use as supplied.

Storage and Stability

The unopened reagents are stable until the expiration date stated on the label when stored at 2° - 8°C.

Deterioration

1. The reagents should be clear, colorless solutions.
2. If the reagent blank absorbance exceeds 0.350 at 340/380 nm, the reagent may have deteriorated and should not be used.
3. Failure to achieve assay values on freshly prepared control sera could indicate deterioration.

SPECIMEN COLLECTION

Clear, non-hemolyzed serum is the recommended sample.¹

Sample Storage

The serum should be separated as soon as possible after collection. Phosphorus in serum is stable for 7 days at 2° - 8°C.²

Interfering Substances

1. Hemolysis, lipemia and bilirubin interfere with this assay.
2. Young has reviewed drug effects on serum inorganic phosphorus levels.⁴

PROCEDURE

Test Parameters

Refer to the Thermo Reagent Applications.

Materials Provided

Each component is sold separately.

1. 7500-118 I. Phos. Acid (R1) 4 x 500 mL
2. 7500-218 I. Phos. (R2) 4 x 175 mL

Materials Required But Not Provided

1. Analyzer with Manual and Accessories
2. Thermo Reagent Applications
3. Thermo Data-Cal (Cat. No. 1905-505 or TR43001) or equivalent
4. Thermo Data-Trol N and Data-Trol A (Cat. No. 1902-050 or TR40001 and 1901-050 or TR41001) or equivalent

Stability of Final Reaction Mixture

The instrument automatically computes every determination at the same time interval.

Calibration

Thermo Data-Cal (Cat. No. 1905-505 or TR43001) or equivalent should be used to calibrate the instrument.

Linearity

Linearity extends to 15 mg/dL. Samples exceeding linearity should be diluted with normal saline and repeated. Multiply the result by the dilution factor when calculating the unknown.

Quality Control

Normal and abnormal control sera of known concentrations of inorganic phosphorus should be analyzed routinely with each group of unknown samples. Thermo's Data-Trol N and Data-Trol A (Cat. No. 1902-050 or TR40001 and 1901-050 or TR41001) are recommended for this purpose.

Calculation of Results

Results, expressed in mg/dL at 37°C, are automatically calculated.

Limitations

See Storage and Stability, Deterioration, Specimen Collection, Interfering Substances, Sample Storage, and Linearity sections for limitations to this procedure.

EXPECTED VALUES

An observed range for inorganic phosphorus, derived from a study of 52 asymptomatic adults in the Southwest USA, was found to be 1.9 - 4.2 mg/dL. A reference range of 2.7 - 4.5 mg/dL has been reported in the literature.⁵ These ranges should serve only as guidelines. It is recommended that each laboratory establish its own range of expected values, since differences exist between instruments, laboratories, and local populations.

PERFORMANCE CHARACTERISTICS

Precision

Within-run precision was determined by assaying control sera in replicate.

WITHIN-RUN	n	MEAN	STD. DEV.	CV%
Level 1	20	3.2	0.03	0.94
Level 2	20	7.2	0.05	0.69

Run-to-run reproducibility was obtained by assaying control sera for 10 runs.

RUN-TO-RUN	n	MEAN	STD. DEV.	CV%
Level 1	20	3.2	0.08	2.50
Level 2	20	7.2	0.17	2.36

Sensitivity

Based on an instrument resolution of A = 0.001, this Thermo I. Phosphorus Procedure has a sensitivity of 0.02mg/dL.

REFERENCES

1. Tietz, N.W., Fundamentals of Clinical Chemistry, W.B. Saunders, Philadelphia, 1976, p. 901, 915-917.
2. Henry, R.J., Cannon, D.C., and Winkelman, J.W., Clinical Chemistry, Principles and Technics, 2nd. ed., Harper and Row, Hagerstown, 1974, p. 720.
3. Tietz, N.W., Textbook of Clinical Chemistry, W.B. Saunders, Philadelphia, 1986, p. 1352.
4. Young, D.S., Effects of Drugs on Clinical Laboratory Tests, 3rd ed., AACC Press, Washington, D.C., 1990, p. 3-265 - 3-270.
5. Tietz, N.W., Clinical Guide to Laboratory Tests, W.B. Saunders, Philadelphia, 1983, p. 384-385.

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REF

Reorder Information

<u>Catalogue No.</u>	<u>Configuration</u>
7500-118	4 x 500 mL Reagent 1
7500-218	4 x 175 mL Reagent 2