

For the colorimetric determination of potassium in human serum and plasma.

BACKGROUND & SYNOPSIS

Potassium is the principle cation of the intracellular fluid. It is also an important constituent of the extracellular fluid due to its influence on muscle activity. Its intracellular function parallels that of its extracellular function, namely influencing acid-base balance and osmotic pressure, including water retention.

Elevated potassium levels (hyperkalemia) are often associated with renal failure, dehydration shock of adrenal insufficiency. Decreased potassium levels (hypokalemia) are associated with malnutrition, negative nitrogen balance, gastrointestinal fluid losses and hyperactivity of the adrenal cortex.

In previously described colorimetric methods for determination of potassium or sodium, prior deproteinization of serum or plasma specimen was required. Our improved method is the direct spectrophotometric measurement of potassium in blood or plasma.

PRINCIPLE

The amount of potassium is determined by using sodium tetraphenylboron in a specifically prepared mixture to produce a colloidal suspension.

PRESENTATION

	No. of Bottles
All reagents to be stored at 2-8°C	15 Test
Potassium Liquid	1
Potassium Standard (5mmol/l)	1

PRECAUTION

- Potassium Reagent set is for *in-vitro* diagnostic use^r only.
 - Sodium Tetraphenylboron is a corrosive substance. Avoid skin contact or ingestion.
- DO NOT PIPETTE BY MOUTH. Flush with water if contact occurs.

PREPARATION OF WORKING REAGENT

Ready to use

REAGENT STORAGE AND STABILITY

The reagents included in the kit are stable at 2-8°C Until the expiry date indicated on the label.

SPECIMEN COLLECTION

- Serum is recommended.
- Potassium in serum is stable for at least 1 week at 2-8°C.
- Specimen for serum potassium analysis should be free from hemolysis since the high concentration of potassium released from red cells significantly increase the serum levels and this invalidates the test results. Blood specimens should also be separated from the red cells shortly after collection to prevent any leakage of potassium from the intracellular into the intracellular fluid. Plasma form anticoagulants not containing potassium is also suitable.

INTERFERENCES

Turbid or icteric samples produce falsely elevated results. Bilirubin above 40 mg/dl and Urea Nitrogen above 80 mg/dl will produce elevated results. Hemolyzed sera produce elevated results. Sera containing high levels of ammonia should be avoided.

REACTION PARAMETERS

* Type of reaction	:	End Point
* Wavelength	:	578 nm (570-580nm)
* Flowcell Temperature	:	30°C
* Incubation	:	5-10 min. at 30°C
* Std. Concentration	:	5 mmol/L
* Sample volume	:	25 µl (0.025 ml)
* Reagent volume	:	1.0 ml

ONE REAGENT PROCEDURE

For instruments with 1.0 ml/0.5 ml cuvette capacities or flow cells requirements.

PIPETTE INTO TEST TUBES	Procedure for 1 ml			Procedure for 0.5 ml		
	BLK	STD.	TEST	BLK	STD.	TEST
* RGT (ml)	1.0	1.0	1.0	0.5	0.5	0.5
* STD (ml)	-	0.025	-	-	0.01	-
* SAMPLE (ml)	-	-	0.025	-	-	0.01

Mix and incubate at 30°C for 5-10 min. and read absorbance of test and standard against reagent blank at 578 nm (570-580 nm).

STABILITY OF FINAL COLOUR DEVELOPED

The reaction mixture is stable for one hour when protected from direct light.

CALCULATIONS

Abs. = Absorbance
STD = Standard

$$\frac{\text{Abs. of unknown}}{\text{Abs. of STD.}} \times \text{Conc. of STD (mmol/L)} = \text{Potassium Conc (mmol/L)}$$

Example : If the absorbance of the unknown = 0.800, the absorbance of the standard is 0.96 and standard concentration is 5 mmol/L, then

$$\frac{0.800}{0.960} \times 5 = 4.17 \text{ mmol/L}$$

NORMAL VALUES

3.6– 5.5 mmol/L.

It is strongly recommended that each laboratory establish its own normal range.

LINEARITY

The method is linear upto 10 mmol/L.

REFERENCE

- Henry R.F. et. Al., Clinical Chemistry Principles and Techniques, 2nd Ed., Harper and Row, Hagerstown, M.D., (1974).
- Tietz, N.W, Fundamentals of Clinical Chemistry, W.B., Saunders CO., Philadelphia, PA, p.874.
- Terri, A.E., and Sesin, P.G., Am.J. Clin. Path, 29:86 (1958).

