Reactivos GPL

Barcelona, España

CE

- Potassium-p -

POTASSIUM
TPB-Na Method

Store at: +2+8ºC.

Presentation:
Cod. SU030 CONT: 2 x 50 mL.

Procedure

Quantitative determination of Potassium.

Only for *in vitro use in clinical laboratory* (IVD)

TEST SUMMARY

Potassium ions in a protein-free alkaline medium react with sodium tetraphenylboron to produce a finely dispersed turbid suspension of potassium tetraphenyylboron. The turbidity produced is proportional to the potassium concentration and read photometrically.

COMPOSICIÓN DE LOS REACTIVOS

PREC	Trichloroacetic acid (TCA)	0.3 mol/L
R.1 TPB-Na	Sodium tetraphenylboron (TPB-Na)	0.2 mol/L
R.2 NaOH	Sodium hydroxide	2.0 mol/L
K-p CAL	Sodium aqueous primary standard 5.0 mmol/L	

PRECAUTIONS

R2: H314-Causes severe skin burns and eye damage.
R3 /CAL: H314-Causes severe skin burns and eye damage. H335- May cause respiratory irritation. H411-Toxic to aquatic life with long lasting effects.
Follow the precautionary statements given in MSDS and label of the product.

REAGENT PREPARATION AND STABILITY

Working reagent (WR):
Mix equal volumes of R.1 TPB-Na and R.2 NaOH. (Shake before to use)
Allow to stand for 15-30 minutes prior to use. The working reagent must be shaked before each use.
The working reagent is stable for 7 days at 15-25ºc and 30 days at 2-8ºc.

All the reagents of the kit are stable up to the end of the indicated month and year of expiry. Store at tightly closed at 2-8ºC. Do not use reagents over the expiration date.

SPECIMEN

- Non-haemolytic serum or heparin plasma

MATERIAL REQUIRED BUT NOT PROVIDED

- Spectrophotometer or colorimeter measuring at 578 nm.
- Matched cuvettes 1.0 cm light path.

General laboratory equipment[Note 1, 2, 3].

PROCEDURE

1. Assay conditions:
- Wavelength: . . . . . 578 nm
- Cuvette: . . . . . 1 cm. light path
- Temperature . . . . . 37ºC /15-25ºC
2. Adjust the instrument to zero with distilled water.
3. Pipette into a cuvette:

Sample (µL)	50
Precipitating sol. (µL)	500

4. Mix carefully.
5. Centrifuge at high speed for 5-10 min.
6. Separate the clear supernatant and pipette on another cuvettte:

	Standard	Sample
Working reagent (µL)	1.0	1.0
Standard (µL)	100	--
Supernatant (µL)	--	100

7. To produce an homogeneous turbidity, the standard or the clear supernatant must to be added to the center of the surface of the working reagent in the cuvette. Mix each cuvette carefully before proceding to the next sample.
8. Read the absorbance (A) of standard and samples against working reagent after 5 minutes. Color is stable up to 30 minutes.

CALCULATIONS

$$\frac{A_{Sample}}{A_{STD}} \times 5.00 \text{ (Standard conc.)} = \text{mmol/L potassium in the sample}$$

Conversion factor: mmol/L = mEq/L.

QUALITY CONTROL

Control sera are recommended to monitor the performance of the procedure, Control H Normal Ref. QC003 and Control H Pathological Ref. QC004. If control values are found outside the defined range, check the instrument, reagents and calibrator for problems.

Serum Controls are recommended for internal quality control. Each laboratory should establish its own Quality Control scheme and corrective actions if controls do not meet the acceptable tolerances.

REFERENCE VALUES[1]

Serum: 3.60 – 5.50 mmol/L
Plasma: 4.00 – 4.80 mmol/L
These values are for orientation purpose.

It is suggested that each laboratory establish its own reference range.

CLINICAL SIGNIFICANCE

Potassium (K+) is the major positive ion within cells and is particularly important for maintaining the electric charge on the cell membrane. This charge allows nerves and muscles to communicate and is necessary for transporting nutrients into cells and waste products out of the cell. The concentration of potassium inside cells is about 30 times that in the blood and other fluids outside of cells.
Potassium levels are mainly controlled by the steroid hormone aldosterone. Aldosterone is secreted from the adrenal gland when levels of potassium increase. Aldosterone, in turn, causes the body to rid itself of the excess potassium. Metabolic acidosis (for example, caused by uncontrolled diabetes) or alkalosis (for example, caused by excess vomiting) can affect blood potassium.
In normal people, taking potassium supplements or potassium-containing drugs is of no consequences, because the kidneys efficiently dispose of excess potassium.

REAGENT PERFORMANCE

- *Measuring range*: From detection limit of 2 mmol/L to linearity limit of 20 mmol/L.
  If the results obtained were greater than linearity limit, dilute the sample 1/2 with NaCl 9 g/L and multiply the result by 2.
- *Precision:*

	Intra-assay (n=20)		Inter-assay (n=20)	
Mean (mmol/L)	4.15	6.70	4.15	6.70
SD	0.11	0.176	0.152	0.19
CV (%)	2.58	2.54	4.11	2.23

- *Sensitivity:* 1 mmol/L = 0.537A.
- *Accuracy:* Results obtained using GPL reagents did not show systematic differences when compared with other commercial reagents.
  The results of the performance characteristics depend on the analyzer used.

INTERFERING SUBSTANCES

A list of drugs and other interfering substances with potassium determination has been reported by Young et. al[5,6].

NOTES

1. K-p CAL: Proceed carefully with this product because due its nature it can get contamined easily.
2. As red blood cells contain about 25 times the amount of potassium, they have to be separated from the serum within one hour after blood collection. Otherwise, falsely elevated potassium concentrations will be found.
3. Traces of detergents produce turbidity which leads to falsely elevated potassium concentrations. They therefore have to be avoided.
4. Calibration with the aqueous standard may cause a systematic error in automatic procedures. In these cases, it is recommended to use a serum Calibrator.
5. The R.2 (NaOH) and the working reagent must be shaked before their use.
6. GPL has instruction sheets for several automatic analyzers. Instructions for many of them are available on request.

BIBLIOGRAPHY

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