POTASSIUM

Enzymatic kinetic-UV determination
of Potassium
in serum and urine

4 lyo x 12.5 ml + 2 lyo x 11 ml **REF CY09-72**

Additional kit:

2 x 5 x 1 ml POTASSIUM STANDARD **REF 7502**

Two levels aqueous standard (high and low)

PRINCIPLE

The assay is based on the activation ofpyruvate kinase (PK) with the potassium present in the sample. The potassium concentration is proportional to the phosphoenolpyruvate (PEP) decrease to pyruvate, by pyruvate kinase.
Pyruvate is then transformed into lactate according to the following reaction:

$$PEP + ADP \xrightarrow[PK]{K^+} Pyruvate + ATP$$

$$Pyruvate + NADH + H^+ \xrightarrow{LDH} Lactate + NAD^+$$

REAGENTS

Kit components:	REF CY09-72	Quantity
REAGENT 1/A Buffer pH 8.2	**CY09-72R1**	**1x50 ml**
REAGENT 1/B (lyo blue cap) PEP, ADP, PK, NADH	**CY09-72R2**	**4 vials**
REAGENT 2/A Buffer pH 7.3	**CY09-72R3**	**1x22 ml**
REAGENT 2/B (lyo white cap) LDH	**CY09-72R4**	**2 vials**

STABILITY: stored at 2-8°C, reagents are stable up to the expiration date on the label.

PREPARATION OF WORKING REAGENTS

Let the reagents reach room temperature before the reconstitution.

REAGENT 1 (R1/A + R1/B)
Reconstitute the contents of one vial of Reagent 1/B with exactly 12.5 ml of Reagent 1/A. Shake gently until complete dissolution, avoid formation of foam.
Wait 5 minutes before use.
STABILITY: 1 week at 2-8°C.

REAGENT 2 (R2/A + R2/B)

Reconstitute the contents of one vial of Reagent 2/B with exactly 11 ml of Reagent 2/A. Shake gently until complete dissolution, avoid formation of foam.
Wait 5 minutes before use.
STABILITY: 2 weeks at 2-8°C.

POTASSIUM STANDARD (not included in the kit)

The Potassium standard (REF 7202) kit is made by two aqueous standards:
- low standard (concentration of potassium: 2.5 mmol/L)
- high standard (concentration of potassium: 7.5 mmol/L)

Each laboratory should choose to use low, high or both level standards according to its own needs and experience.

SAMPLE

Serum, plasma with lithium-heparin.
Warning: do not use sodium-EDTA as anticoagulant.

MANUAL ASSAY PROCEDURE

Wavelength:	340 nm
Optical path:	1 cm
Temperature:	37°C
Linearity:	from 2 to 10 mmol/L
Sample/ Reagent 1/ Reagent 2:	1/ 35/ 15
Reaction:	kinetic

Let the reagents reach working temperature before use.
Pipette into microcuvettes labeled as follow: B/R: blank reagent, S: sample, STD: standard:

	B/R	S	STD
Distilled water	0.020 ml	---	---
Sample	---	0.020 ml	---
Standard	---	---	0.020 ml
Reagent 1	0.70 ml	0.70 ml	0.70 ml
Reagent 2	0.30 ml	0.30 ml	0.30 ml

Mix accurately, incubate at 37°C for 2 minutes. Read the initial absorbance at 340 nm against distilled water and start timer simultaneously. Read again after 1 and 2 minutes. Calculate the mean of ΔA/min for the blank reagent, the sample and the standard.

CALCULATION

Using only one standard (low or high)

$$\text{potassium (mmol/L)} = \frac{\Delta A/min\ (S) - \Delta A/min\ (B/R)}{\Delta A/min\ (STD) - \Delta A/min\ (B/R)} \times (STD)$$

where (STD) = concentration of potassium in mmol/L of the standard used in the test.

Using both standards (low and high)

Using the two standards, draw a calibration line and calculate the potassium concentration in the sample.

Conversion values: mmol/L = mEq/L
mg/dl = mmol/L x 3.9

REFERENCE VALUES

Serum / plasma: 3.5 - 5.1 mmol/L (13.7-19.9 mg/dl)

PERFORMANCE CHARACTERISTICS

Linearity: between 2 and 10 mmol/L (7.8-39.0 mg/dl).
For values higher than 10 mmol/L, dilute the sample with the same volume of distilled water and multiply the result by 2 .

Within-run precision:

	Level 1	Level 2
Average (mmol/L)	2.51	7.48
DS	0.05	0.25
CV %	1.99	3.34

Between-run precision:

	Level 1	Level 2
Average (mmol/L)	2.48	7.52
DS	0.10	0.37
CV %	4.03	4.92

Interferences:
Up to 0.5 mmol/L of ammonium ions does not interfere. Up to 1100 mg/dl of triglycerides does not interfere. Up to 27 mg/dl of bilirubin does not interfere.

Correlation with flame photometry:
FAR kit for potassium determination shows a correlation coefficient equal to 0.982, in comparison to flame photometry.

NOTES

1. (*) dangerous reagent are marked with an asterisk. Refer to safety data sheet.
2. Use only potassium, sodium and ammonium ions free distilled water.
3. Use perfectly clean laboratory material (tips, glassware).
4. Reaction volumes can be proportionally changed.
5. Perform the measure of the standard for each sample series.
6. Disposal waste material in accordance with local law.
7. Chemistry analyzer parameters are available.

REFERENCES

Available upon request.

MANUFACTURER

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KEY SYMBOLS

IVD	In Vitro diagnostic medical device
LOT	batch number
REF	catalogue number
	temperature limits
	use by
	caution
	consult accompanying documents

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