Reactivos GPL

Barcelona, España

CE

- SODIUM-p -

SODIUM
Mg-Uranylacetate Method

Store at: +2+8ºC.

Presentation:
Cod. SU032 CONT: 1 x 60 mL.

Procedure

Quantitative determination of Sodium ion.

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

TEST SUMMARY
Sodium is precipitated with Mg-uranyl acetate; the uranyl ions remaining in suspension form a yellow-brown complex with thioglycolic acid. The difference between reagent blank (without precipitation of sodium) and analysis is proportional to the sodium concentration.

COMPOSICIÓN DE LOS REACTIVOS

R1	Ammonium thioglycolate	550 mmol/L
	Ammonia	550 mmol/L
R2 PREC	Uranyl acetate	19 mmol/L
	Magnesium acetate	140 mmol/L
NA-p CAL	Sodium aqueous primary standard 150 mmol/L	

PRECAUTIONS
R1: H302-Harmful if swallowed. H314-Causes severe skin burns and eye damage. H335-May cause respiratory irritation.
R2: H226-Flammable liquid and vapour. H302-Harmful if swallowed.
Follow the precautionary statements given in MSDS and label of the product.

REAGENT PREPARATION AND STABILITY
All the reagents are ready to use.

Signs of reagent deterioration:
- Precipitating solution becomes discoloured when exposed to the light. Store protected from light. A slight turbidity does not affect the determination.

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

SPECIMEN
- Serum.

MATERIAL REQUIRED BUT NOT PROVIDED
- Spectrophotometer or colorimeter measuring at 365 nm.
- Matched cuvettes 1.0 cm light path.

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

PROCEDURE
1. Assay conditions:
   - Wavelength: . . . . . 410 nm
   - Cuvette: . . . . . 1 cm. light path
   - Temperature . . . . . 37ºC /15-25ºC
2. Adjust the instrument to zero with distilled water.
3. Pipette into a cuvette:

	Blank	Standard	Sample
Standard (µL)	--	10	--
Sample (µL)	--	--	10
Precipitating sol. (µL)	--	500	500

4. Close tubes and mix well. Allow stand for 5 minutes
5. Shake intensively for at least 30 sec. Allow standing for 30 min.
6. Centrifuge at high speed for 5-10 min.
7. Separate the clear supernatant and pipette on another cuvettte:

	Blank	Standard	Sample
Precipitating sol. (µL)	10	--	--
Supernatant (µL)	--	10	10
Reagent (µL)	500	500	500

8. Mix and incubate for 5-30 at room temperature.
9. Read the absorbance (A) of the blank, standard and samples. The color is stable for at least 30 minutes.

CALCULATIONS
$$\frac{A_{Blank} - A_{Sample}}{A_{Blank} - A_{STD}} \times 150 \text{ (Standard conc.)} = \text{mmol/L sodium in the sample}$$

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[5]
Serum: 135 - 155 mmol/L

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

CLINICAL SIGNIFICANCE
This test is performed when symptoms of a sodium imbalance are present, or when disorders associated with abnormal sodium levels develop. Sodium (Na+) is the major positive ion in the fluids outside of cells. The concentration of sodium inside cells is only about 5 mEq/L compared with 140 mEq/L outside. The sodium content of the blood is a result of a balance between the amount in the food and beverages you consume, and the amount your kidneys excrete. (In addition, a small percent is lost through the stool and sweat).
Many factors affect sodium levels, including the steroid hormone aldosterone, which decreases loss of sodium in the urine. ANP (atrial natriuretic protein) is a hormone secreted from the heart that increases sodium loss from the body.
Despite the integral relationship between sodium and water, the body regulates them independent of each other if necessary.

REAGENT PERFORMANCE
- *Measuring range*: From detection limit of 40 mmol/L to linearity limit of 400 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)	144.25	161.75	133.75	157.75
SD	1.89	2.87	3.20	6.70
CV (%)	1.31	1.78	2.39	4.25

- *Sensitivity:* 1 mmol/L = 0.0006 A
- *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 sodium determination has been reported by Young et. al[5,6].

NOTES
1. NA-p CAL: Proceed carefully with this product because due its nature it can get contamined easily.
2. Detergents usually contain high sodium concentrations. The equipment (test tubes, pipettes, stoppers, cuvettes) must therefore be rinsed carefully with distilled water. Avoid contamination by traces of sodium.
3. Disposable plastic tubes are recommended for the determination to avoid contaminations.
4. Avoid the contact with metal materials.
5. Calibration with the aqueous standard may cause a systematic error in automatic procedures. In these cases, it is recommended to use a serum Calibrator.
6. GPL has instruction sheets for several automatic analyzers. Instructions for many of them are available on request.

BIBLIOGRAPHY

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CHEMELEX, S.A.
Pol. Ind. Can Castells. C / Industria 113, Nave J
08420 Canovelles –BARCELONA-
Tel- 34 93 849 17 35 Fax- 34 93 846 78 75

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