PRODUCT INFORMATION & MANUAL

Sodium (Na) Assay Kit (Colorimetric)

NBP3-25800

For research use only.
Not for diagnostic or therapeutic procedures.

www.novusbio.com - P: 303.730.1950 - P: 888.506.6887 - F: 303.730.1966 - technical@novusbio.com

Sodium (Na) Colorimetric Assay Kit

Catalog No: NBP3-25800

Method: Colorimetric method

Specification: 96T (Can detect 92 samples without duplication)

Instrument: Microplate reader

Sensitivity: 0.02 mmol/L

Detection range: 0.02-20 mmol/L

Average intra-assay CV (%): 2.2

Average inter-assay CV (%): 8.4

Average recovery rate (%): 98

- This kit is for research use only.
- Instructions should be followed strictly, changes of operation may result in unreliable results.
- Please kindly provide us the lot number (on the outside of the box) of the kit for more efficient service.

General information

▲Intended use

This kit can measure sodium ions content in serum (plasma) and tissue samples.

▲Background

Sodium (Na), an important inorganic element in living organisms, in the body, mainly comes from the salt in food, which absorbed into the blood through the intestinal. It is the most abundant cation in the extracellular fluid, mostly existing in the form of sodium chloride. Na plays vital roles in the maintenance of extracellular fluid volume, osmotic pressure, pH balance, muscle and nerve normal stress.

▲Detection principle

β-galactosidase activated by sodium ions can catalyze o-nitrophenol to produce glycoside and o-nitrophenol. The increase of absorbance is determined at 405 nm, and the content of sodium ion is calculated indirectly.

▲Kit components & storage

Item	Component	Specification	Storage
Reagent 1	Chromogenic Agent	10 mL × 1 vial	2-8℃ , 12 months, shading light
Reagent 2	Enzyme Stock Solution	20 mL × 1 vial	2-8℃ , 12 months
Reagent 3	Enzyme Reagent	Power × 2 vials	2-8℃ , 12 months
Reagent 4	10 mmol/L Standard	1.6 mL ×1 vial	2-8℃ , 12 months
	Microplate	96 wells	No requirement
	Plate Sealer	2 pieces	
Note: The reagents must be stored strictly according to the preservation conditions in the above table. The reagents in different kits cannot be mixed with each other.			

▲Materials prepared by users

Instruments

Incubator, Microplate reader (405 nm)

⚠ Safety data

Some of the reagents in the kit contain dangerous substances. It should be avoided to touch the skin and clothing. Wash immediately with plenty of water if touching it carelessly. All the samples and waste material should be treated according to the relevant rules of laboratory's biosafety.

⚠ Precautions

Before the experiment, please read the instructions carefully, and wear gloves and work clothes.

▲ The key points of the assay

The sample needs to be diluted before detecting because of the high sodium content.

Pre-assay preparation

▲ Reagent preparation

1. Bring all reagents to room temperature before use.
2. Preparation of working solution:

   Dissolve a vial of reagent 3 powder with 8 mL of reagent 2, and the prepared solution can be stored at 2-8°C for 1 day.

▲ Sample preparation

1. Serum and plasma samples:

   Detect the sample directly.

2. Tissue samples:

   Accurately weigh the tissue, add double distilled water at a ratio of Weight (g): Volume (mL) =1:9 and homogenize the sample. Then centrifuge at 10000 g for 10 min at 4°C, take the supernatant for detection. Meanwhile, determine the protein concentration of supernatant (E-BC-K318-M).

▲Dilution of sample

It is recommended to take 2~3 samples with expected large difference to do pre-experiment before formal experiment and dilute the sample according to the result of the pre-experiment and the detection range (0.02-20 mmol/L).

The recommended dilution factor for different samples is as follows (for reference only)

Sample type	Dilution factor
Human serum	9-12
Human plasma	9-12
Mouse serum	9-12
Rat plasma	10-15

Note: The diluent is double distilled water.

Assay protocol

▲Plate set up

	1	2	3	4	5	6	7	8	9	10	11	12
A	A	A	S13	S21	S29	S37	S45	S53	S61	S69	S77	S85
B	B	B	S14	S22	S30	S38	S46	S54	S62	S70	S78	S86
C	S1	S7	S15	S23	S31	S39	S47	S55	S63	S71	S79	S87
D	S2	S8	S16	S24	S32	S40	S48	S56	S64	S72	S80	S88
E	S3	S9	S17	S25	S33	S41	S49	S57	S65	S73	S81	S89
F	S4	S10	S18	S26	S34	S42	S50	S58	S66	S74	S82	S90
G	S5	S11	S19	S27	S35	S43	S51	S59	S67	S75	S83	S91
H	S6	S12	S20	S28	S36	S44	S52	S60	S68	S76	S84	S92

Note:A, blank wells; B, standard wells; S1-S92, sample wells.

▲Detailed operating steps

The measurement of samples

(1) Blank well: Add 10 μL of double distilled water to the corresponding well.

Standard well: Add 10 μL of standard to the corresponding well.

Sample well: Add 10 μL of sample to the corresponding well.

(2) Add 80 μL of reagent 1 to each welle.

(3) Add 120 μL of working solution to each well.

(4) Measure the OD value of each well at 405 nm with microplate reader, recorded as A_1.

(5) Incubate at 37℃ for 3 min, measure the OD value of each well at 405 nm with microplate reader, recorded as A_2, $\Delta A=A_2-A_1$.

▲Summary operation table

	Blank well	Standard well	Sample well
Sample (μL)			10
Standard (μL)		10	
Double distilled water (μL)	10		
Reagent 1 (μL)	80	80	80
Working solution (μL)	120	120	120
Measure the OD value at 405 nm, recorded as A_1. Incubate at 37℃ for 3 min, measure the OD value at 405 nm, recorded as A_2, $\Delta A=A_2-A_1$.			

▲Calculation

1. Serum (plasma) sample:

$$Na^+ \text{ content (mmol/L)} = (\Delta A_{Sample} - \Delta A_{Blank}) \div (\Delta A_{Standard} - \Delta A_{Blank}) \times c \times f$$

2. Tissue sample:

$$Na^+ \text{ content (mmol/gprot)} = (\Delta A_{Sample} - \Delta A_{Blank}) \div (\Delta A_{Standard} - \Delta A_{Blank}) \times c \div C_{pr} \times f$$

Note:

ΔA_{Sample}: The OD value of sample well (A_2-A_1).

ΔA_{Blank}: The OD value of blank well (A_2-A_1).

$\Delta A_{Standard}$: The OD value of standard well (A_2-A_1).

c: The concentration of the standard, 10 mmol/L.

C_{pr} : Concentration of protein in sample, gprot/L.

f: Dilution factor of sample before tested.

Appendix I Data

▲Example analysis

For human serum, take 10 μL of human serum diluted for 10 times, and carry the assay according to the operation table.

The results are as follows:

the average change OD value of sample (ΔA_{Sample}) is 0.433, the average change OD value of blank (ΔA_{Blank}) is 0.146, the average change OD value of standard ($\Delta A_{Standard}$) is 0.351, and the calculation result is:

$$Na^+ \text{ content (mmol/L)} = (0.433 - 0.146) \div (0.351 - 0.146) \times 10 \times 10$$

$$= 140 \text{ mmol/L}$$