

Blood Potassium Content Assay Kit

Note: It is necessary to predict 2-3 large difference samples before the formal determination.

Operation Equipment: Spectrophotometer

Cat No: BC2770

Size: 50T/48S

Components:

Reagent I: Liquid 25mL×1, store at 2-8°C.

Reagent I Working Solution: Accordance the ratio Reagent I: concentrated sulfuric acid =5:12 prepare solution before use.

Reagent II A: Liquid 6mL×1, store at 2-8°C.

Reagent II B: Powder×2, store at 2-8°C. Take 2.8ml of reagent IIA to one reagent IIB before using and mix thoroughly. The unused reagent can be stored at 2-8°C for one week.

Reagent III: Liquid 40mL×1, store at 2-8°C.

Standard: Liquid 1mL×1, 2μmol/mL potassium standard, store at 2-8°C. Dilute 5 times before use, prepare as 0.4μmol/mL potassium standard.

Description:

Potassium maintains normal osmotic pressure and acid-base balance, participates in sugar and protein metabolism, and ensures normal neuromuscular function. If blood potassium concentration is more than 5.5mmol/L, the disease is called high blood potassium, which increases sensitivity of nerve and muscle, decreases sensitivity of Myocardial stress. When serum potassium concentration exceeds 10mmol/L, ventricular fibrillation or even diastolic arrest occurs. When serum potassium is lower than 3.5mmol/l, hypokalemia can cause muscle weakness, muscle flaccid paralysis, increase of myocardial stress, tachycardia, arrhythmia and even arrest in systolic phase. Therefore, serum potassium is a commonly biochemical index.

Potassium ion in serum is reacted with sodium tetraphenylboron to form potassium tetraphenylboron insoluble in water, and the turbidity is proportional to the concentration of potassium ion in a certain range. The content of serum potassium was determined by measuring its turbidity.

Required but not provided:

Spectrophotometer, centrifuge, transferpeltor, 1mL glass cuvette, **concentrated sulfuric** and distilled water.

Procedure:

I. Extraction:

Serum pretreatment: Add 50μL of serum and 450μL of Reagent I working solution into centrifuge tube, mix thoroughly, centrifuge at 8000rpm and 25°C for 10min, the supernatant is used for detecting.

II. Determination procedure:

1. Preheat spectrophotometer for 30 min, adjust wavelength to 520nm, set zero with distilled water.
2. Preheat Reagent III at 25°C water bath for 30min.
3. Operation table:

Reagent (μL)	Blank tube (B)	Test tube (T)	Standard tube (S)
Distilled water	200	-	-
0.2 μmol/mL standard	-	-	200
Supernatant	-	200	-
Reagent II	100	100	100
Mix thoroughly, react for 5 min.			
Reagent III	700	700	700
Mix thoroughly, detect the absorbance at 520nm, record A_B , A_T , A_S . The standard tube and blank tube only need to be measured once or twice.			

III. Calculation:

$$\text{Blood Potassium content } (\mu\text{mol/mL}) = [C_S \times (A_T - A_B) \div (A_S - A_B)] \times F = 4 \times (A_T - A_B) \div (A_S - A_B)$$

C_S : 0.4 μmol/mL;

F : $(50\mu\text{L serum} + 450\mu\text{L Reagent I}) \div 50\mu\text{L serum} = 10$.

Note:

1. Serum potassium should be determined as soon as possible after blood collection. Too long time will affect the content of serum potassium.
2. If the absorbance value of the sample is greater than 1.2, it is recommended to dilute the sample with reagent - working solution for determination, the calculation formula needs to be changed accordingly.

Experimental example:

1. The mouse serum is taken and operated according to the determination steps. $A_T = 0.636$, $A_B = 0.012$, $A_S = 0.397$. And calculate the blood potassium content:

$$\text{Blood potassium content } (\mu\text{mol/mL}) = 4 \times (A_T - A_B) \div (A_S - A_B) = 6.48 \mu\text{mol/mL}.$$

Related Products:

- BC2790/BC2795 Blood Magnesium Content Assay Kit
- BC1650/BC1655 Blood Phosphate Content Assay Kit
- BC2800/BC2805 Blood Sodium Content Assay Kit
- BC1730/BC1735 Serum Ferri Ion Content Assay Kit

Technical Specifications:

The detection limit: 0.0095 mg/mL

The linear range: 0.05-1.5 mg/mL

