

Soil Ammonium Nitrogen Content Assay Kit

Note: Take two or three different samples for prediction before test.

Operation Equipment: Spectrophotometer/Microplate reader

Cat No: BC1515

Size: 100T/96S

Components:

Extract solution: 100 mL×1, store at -20°C.

Reagent I A: 1 mL×1, store at 4°C and protect from the light.

Reagent I B: 4 mL×1, store at 4°C and protect from the light.

Reagent I prepared: Before use, add Reagent I A into Reagent I B and mix it for standby, or prepared when the solution will be used in proportion. it can be stored for 2 weeks in the dark at 4°C. If it changes color, you can't continue to use it.

Reagent II: 2.5 mL×1, store at 4°C and protect from the light.

Standard: 1 mL×1, 100 µg/mL NH₄⁺-N standard solution, store at 4°C.

Product Description:

Soil ammonium nitrogen is an important component of soil available nitrogen, which can be directly absorbed and utilized by plants. Ammonium nitrogen index plays an important role in agricultural production.

In the strong alkaline medium, the ammonium nitrogen in the soil interacts with hypochlorite and phenol to form indophenol blue dye, which has a characteristic absorption peak at 630 nm, and the absorption value is directly proportional to the ammonium nitrogen content.

Required reagents and equipments:

Spectrophotometer/microplate reader, scale, centrifuge, micro glass cuvette/96 well flat-bottom plate, oscillator, water bath.

Protocol:

I. Sample treatment

The ratio of soil mass (g): extraction solution volume (mL) is 1:5~10 (it is recommended to weigh about 0.1 g of soil sample and add 1 mL of extract solution), extract it by shaking for 1 hour. Centrifugate at 10000 ×g for 10 minutes at 25°C, take the supernatant and place it for test. (Refer to Note 1.2 for soil sample requirements.)

II. Measurement operation

1. Preheat spectrophotometer/microplate reader for 30 minutes, adjust wavelength to 630 nm, spectrophotometer set zero with distilled water.
2. Standard solution dilution: Take 20µL of 100µg/mL 100 µg/mL NH₄⁺-N standard solution before use, add 780µL of distilled water, mix well, and prepare 2.5µg/mL standard solution for use, (In

the

experiment, each tube needs 120 μ L, in order to reduce the experiment error, so prepare a large volume.)

3. Sampling table

| Reagent name (μ L) | Blank tube (B) | Standard tube (S) | Test tube (T) |
|---|----------------|-------------------|---------------|
| Sample | - | - | 120 |
| Distilled water | 120 | - | - |
| Standard | - | 120 | - |
| Reagent I | 24 | 24 | 24 |
| Reagent II | 18 | 18 | 18 |
| Mix well and place at room temperature of 25°C for 30 minutes. | | | |
| Distilled water | 138 | 138 | 138 |
| After fully mixing, take 200 μ L in the micro glass cuvette/96 well flat-bottom plate to measure the absorption value at 630 nm, and record it as A_B , A_S and A_T . Calculate $\Delta A_S = A_S - A_B$, $\Delta A_T = A_T - A_B$. | | | |

III. Calculation:

$$\text{NH}_4^+\text{-N } (\mu\text{g/g Soil}) = \Delta A_T \div \Delta A_S \times C_S \times V_E \div W = 2.5 \times \Delta A_T \div \Delta A_S \div W$$

C_S : Concentration of standard solution, 2.5 $\mu\text{g/mL}$;

V_E : Volume of extract solution, 1 mL;

W : Sample mass, g.

Note:

- Soil after Air-drying or drying can easily cause changes in $\text{NH}_4^+\text{-N}$ content, so it is recommended to use fresh soil for determination. The samples should be sealed, transported and stored at 4°C after collection, and the analysis should be completed within 3 days. Otherwise, it should be stored in small pieces at -20°C (deep freezing) and can be stored for several weeks. When determining the $\text{NH}_4^+\text{-N}$ content of deep freezing, the temperature and time of thawing should be controlled. When thawing at room temperature, the sample must be thawed, homogenized and extracted within 4 hours; if it is thawed at 4°C, the thawing time should not exceed 48 hours.
- If you want to compare the $\text{NH}_4^+\text{-N}$ content between different samples, you need to dry the soil sample and calculate it by dry weight before comparing.
- When ΔA is greater than 1.4, it is recommended to dilute the sample with distilled water for determination.

Technical Specifications:

Minimum Detection Limit: 0.1314 $\mu\text{g/mL}$

Linear Range: 0.15625-18 $\mu\text{g/mL}$

Experimental example:

1. Take 0.1g clover to 1ml extract solution, shock and centrifuged for 1 hour, operate as the procedure after taking the supernatant, test and calculate $\Delta A_T = A_T - A_B = 0.144 - 0.062 = 0.082$, $\Delta A_S = A_S - A_B = 0.326 - 0.062 = 0.264$, calculate content by sample weight:
 $NH_4^+ - N$ ($\mu\text{g/g}$ weight) = $2.5 * \Delta A_T \div \Delta A_S \div W = 2.5 \times 0.082 \div 0.264 \div 0.1 = 7.77 \mu\text{g/g}$ weight.
2. Take 0.1g forest soil to 1ml extract solution, shock and centrifuged for 1 hour, operate as the procedure after taking the supernatant, test and calculate $\Delta A_T = A_T - A_B = 0.131 - 0.062 = 0.069$, $\Delta A_S = A_S - A_B = 0.326 - 0.062 = 0.264$, calculate content by sample weight:
 $NH_4^+ - N$ ($\mu\text{g/g}$ weight) = $2.5 * \Delta A_T \div \Delta A_S \div W = 2.5 \times 0.069 \div 0.264 \div 0.1 = 6.53 \mu\text{g/g}$ weight.

Related products:

BC0040/BC0045 Soil Nitrate Nitrogen Content Assay Kit

BC2980/BC2985 Soil Available sulfur Content Assay Kit

