

Soil Ammonium Nitrogen Content Assay Kit

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

Operation Equipment: Spectrophotometer

Cat No: BC1510

Size: 50T/48S

Components:

Extract solution: 50 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: 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, scale, centrifuge, 1 mL glass cuvette, oscillator, water bath.

Protocal:

I. Sample treatment

The ratio of soil mass (g): extract 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 hours. 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 for 30 minutes, adjust wavelength to 630 nm, 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 400µL, in order to reduce the experiment error, so prepare a large volume.)

3. Sampling table

Reagent name (μL)	Blank tube (B)	Standard tube (S)	Test tube (T)
Sample	-	-	400
Distilled water	400	-	-
Standard	-	400	-
Reagent I	80	80	80
Reagent II	60	60	60
Mix well and place at room temperature of 25°C for 30 minutes.			
Distilled water	460	460	460
After fully mixing, measure the absorption value at 630 nm, and record it as A _B , A _S and A _T . Calculate ΔA _S =A _S -A _B , ΔA _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 μg/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 NH₄⁺-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 NH₄⁺-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 NH₄⁺-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 0.7, it is recommended to dilute the sample with distilled water for determination.

Technical Specifications:

Minimum Detection Limit: 0.0646 μg/mL

Linear Range: 0.156-5 μg/mL

Experimental example:

- 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 ΔA_T=A_T-A_B=0.165-0.02=0.145, ΔA_S=A_S-A_B=0.37-0.02=0.35, calculate content by sample weight:
 NH₄⁺-N (μg/g weight) = 2.5 * ΔA_T ÷ ΔA_S ÷ W = 2.5 × 0.145 ÷ 0.35 ÷ 0.1 = 10.36 μg/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 $\Delta A_T = A_T - A_B = 0.145 - 0.02 = 0.125$, $\Delta A_S = A_S - A_B = 0.37 - 0.02 = 0.35$, calculate content by sample weight:

$$\text{NH}_4^{+}\text{-N } (\mu\text{g/g weight}) = 2.5 * \Delta A_T \div \Delta A_S \div W = 2.5 \times 0.125 \div 0.35 \div 0.1 = 8.93 \mu\text{g/g weight}.$$

Related products:

BC0040/BC0045 Soil Nitrate Nitrogen Content Assay Kit

BC2980/BC2985 Soil Available sulfur Content Assay Kit

