

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. 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.

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.

II. Measurement operation

1. Preheat spectrophotometer/microplate reader for 30 minutes, adjust wavelength to 630 nm, set zero with distilled water.
2. Dilute 100 µg/mL nitrogen standard solution with distilled water to 2.5 µg/mL for standby.
3. Sampling table

Reagent name (µL)	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 µL 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 µg/mL;

V_E: Volume of extract solution, 1 mL;

W: Sample mass, g.

Note:

1. 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.

2. 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.
3. When ΔA is greater than 1.4, it is recommended to dilute the sample with distilled water for determination.
4. The Reagent I shall be stored at 4°C and protect from light and cannot be used after discoloration.

Technical Specifications:

Minimum Detection Limit: 0.1314 ug/mL

Linear Range: 0.15625-18 ug/mL

Related products:

BC0040/BC0045 Soil Nitrate Nitrogen Content Assay Kit

BC2980/BC2985 Soil Available sulfur Content Assay Kit

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: $\text{NH}_4^+\text{-N}$ ($\mu\text{ g/g weight}$) = $2.5 * \Delta A_T \div \Delta A_S \div W = 2.5 \times 0.082 \div 0.264 \div 0.1 = 7.77 \mu\text{ g/g weight}$.
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: $\text{NH}_4^+\text{-N}$ ($\mu\text{ g/g weight}$) = $2.5 * \Delta A_T \div \Delta A_S \div W = 2.5 \times 0.069 \div 0.264 \div 0.1 = 6.53 \mu\text{ g/g weight}$.