

# Soil Available Silicon Content Assay Kit

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

**Detection instrument:** Spectrophotometer/Microplate Reader

**Cat No:** BC2975

**Size:** 100T/96S

## Components:

**Extract Solution:** Liquid 110 mL×1. Storage at 2-8°C.

**Reagent I:** Liquid 6 mL×1. Storage at 2-8°C.

**Reagent II:** Powder×1. Storage at 2-8°C. Before use, add 6 mL distilled water to fully dissolve it, the unused reagent can be stored at 2-8°C for 4 weeks.

**Reagent III:** Liquid 6 mL×1. Storage at 2-8°C.

**Reagent IV:** Powder×2. Storage at 2-8°C. Before use, take one and add 3 mL Reagent V to fully dissolve it. The unused reagent can be stored at 2-8°C for 2 weeks.

**Reagent V:** Liquid 7 mL×1. Storage at 2-8°C.

**Standard Solution:** Liquid 0.5 mL×1. storage at 2-8°C. Silicate ion standard solution with concentration of 1mg/mL. Before use, take 25  $\mu$ L of standard solution with concentration of 1 mg/mL and add 775  $\mu$ L of distilled water to prepare a standard solution with concentration of 0.03125 mg/mL for use.

## Product Description:

Silicon is a very important plant nutrient element. The content of available silicon in soil affects the photosynthesis, respiration and stress resistance of plants. Silicate and ammonium molybdate can form silicomolybdic acid under weak acid conditions, which can be reduced to silicomolybdic blue by reducing agent. There is a characteristic absorption peak at 700 nm. The available silicon content in soil can be calculated by detecting the wavelength change at 700 nm.

## Reagents and Equipment Required but Not Provided:

Spectrophotometer/Microplate Reader, Oven, Vortex Oscillator, Balance, Desktop Centrifuge, Water Bath, 1 mL Glass Cuvette, Transferpette, Mortar, 30-50 Mesh Sieve and Distilled Water.

## Procedure:

### I. Sample Extraction:

1. Fresh soil samples are naturally air-dried or oven to dry at 65 °C, then sieved by 30~50 mesh sieve.
2. Add Extract Solution according to the ratio of soil mass(g): the volume of Extract Solution(mL)=1:5(it is recommended to weigh about 0.2 g of soil sample, add 1 mL of Extract Solution), shake it in the shaker for 1 hour. Centrifuge it at 10000×g for 10 minutes 25 °C, and take the supernatant for test.

### II. Determination procedure:

1. Preheat the spectrophotometer 30 minutes, adjust wavelength to 700 nm, set zero with distilled water.

2. Add reagents with the following list (reaction in EP tube):

Reagent (μL)	Test tube (T)	Blank tube (B)	Standard tube (S)
Sample	50	-	-
Distilled water	-	50	-
Standard	-	-	50
Reagent I	50	50	50
Mix well, place it in a 37 °C water bath for 15 min			
Reagent II	50	50	50
Mix well, place it in a 25 °C water bath for 10 min			
Reagent III	50	50	50
Reagent IV	50	50	50
Mix well, place it in 25 °C environment for 30 min			
Centrifuge at 5000×g for 3 minutes at 25 °C, and take 200 μL of supernatant to detect the absorbance at 700 nm, record as A <sub>T</sub> , A <sub>B</sub> and A <sub>S</sub> respectively. $\Delta A_T = A_T - A_B$ , $\Delta A_S = A_S - A_B$ . The standard curve and blank tube only need to be measured 1-2 times.			

### III. Calculation:

$$\text{Soil Available Silicon Content(mg/g)} = \Delta A_T \times C \div \Delta A_S \times V_e \div W \times N = 0.03125 \times \Delta A_T \div \Delta A_S \div W \times N$$

V<sub>e</sub>: Extraction volume, 1 mL

W: Sample weight, g

C: Concentration of standard solution, 0.03125 mg/mL

N: Dilution multiple

### Note:

1. if A<sub>T</sub> > 2. It is recommended that dilute the sample with the extract and re measure it. Note that the calculation formula is multiplied by the dilution multiple; If the measured absorbance value is too low or close to the blank value, it is recommended that increase the sample size and re measure it, and pay attention to synchronously modify the calculation formula.

### Experimental instances:

1. Take 0.2 g of soil where mushrooms grow, passing through 40 mesh sieve after natural air drying, detect according to the measured steps. Calculate A<sub>T</sub>=1.628, A<sub>B</sub>=0.045, A<sub>S</sub>=0.585,  $\Delta A_T = A_T - A_B = 1.583$ ,  $\Delta A_S = A_S - A_B = 0.54$ .

$$\text{Soil Available Silicon Content(mg/g)} = 0.03125 \times \Delta A_T \div \Delta A_S \div W \times N = 0.4580 \text{ mg/g.}$$

2. Take 0.2 g of forest soil, passing through 40 mesh sieve after natural air drying, detect according to the measured steps. Calculate A<sub>T</sub>=0.7, A<sub>B</sub>=0.045, A<sub>S</sub>=0.585,  $\Delta A_T = A_T - A_B = 0.655$ ,  $\Delta A_S = A_S - A_B = 0.54$ .

$$\text{Soil Available Silicon Content(mg/g)} = 0.03125 \times \Delta A_T \div \Delta A_S \div W \times N = 0.1895 \text{ mg/g.}$$

**Related products:**

- BC2980/BC2985 Soil Available Sulfur Content Assay Kit
- BC1890/BC2895 Free Cholestenone(FC) Content Assay Kit
- BC3040/BC3045 Soil Available Potassium (Turbidimetric Method) Assay Kit
- BC3020/BC3025 Soil Available Boron Content Assay Kit

