



CheKine™ Micro Soil Available Silicon Content Assay Kit

Cat #: KTB4037

Size: 48 T/48 S 96 T/96 S

	Micro Soil Available Silicon Content Assay Kit		
REF	Cat #: KTB4037	LOT	Lot #: Refer to product label
	Applicable sample: Soli		
	Storage: Stored at 4°C for 6 months, protected from light		

Assay Principle

Silicon is a very important plant nutrient element, and the available silicon content in soil affects the photosynthesis, respiration and resistance to adversity of plants. CheKine™ Micro Soil Available Silicon Content Assay Kit can detect biological samples such as soli. In this kit, silicate and ammonium molybdate generate silicomolybdic acid under weak acid conditions, which can be reduced to silicomolybdic blue by reducing agent, and has a characteristic absorption peak at 700 nm. By detecting the wavelength change at 700 nm, the effective silicon content in soil can be calculated.

Materials Supplied and Storage Conditions

Kit components	Size		Storage conditions
	48 T	96 T	
Extraction Buffer	60 mL	120 mL	4°C
Reagent I	3 mL	6 mL	4°C
Reagent II	Powder×1 vial	Powder×1 vial	4°C, protected from light
Reagent III	3 mL	6 mL	4°C, protected from light
Reagent IV	Powder×1 vial	Powder×2 vials	4°C, protected from light
Reagent V	4 mL	8 mL	4°C
Standard	Powder×1 vial	Powder×1 vial	4°C

Note: Before formal testing, it is recommended to select 2-3 samples with large expected differences for pre-experiment.

Materials Required but Not Supplied

- Microplate reader or visible spectrophotometer capable of measuring absorbance at 700 nm
- 96-well microplate or microglass cuvette, precision pipettes, disposable pipette tips, 1.5 mL EP tube
- Water bath, freezing centrifuge, 20 mesh sieve
- Deionized water

Reagent Preparation

Extraction Buffer: Ready to use as supplied. Equilibrate to room temperature before use. Store at 4°C.

Reagent I: Ready to use as supplied. Equilibrate to room temperature before use. Store at 4°C.

Working Reagent II: Prepared before use. Add 3 mL deionized water for 48 T and 6 mL deionized water for 96 T to fully dissolve, 60°C water bath heating for dissolution. The prepared reagent can be stored at 4°C, protected from light for 1 month.

Note: Reagent II has certain irritation, so personal protection is recommended during use.

Reagent III: Ready to use as supplied. Equilibrate to room temperature before use. Store at 4°C, protected from light.

Working Reagent IV: Prepared before use. Add 3 mL Reagent V for each bottle to fully dissolve. The prepared reagent can be stored at 4°C, protected from light for 1 week.

Reagent V: Ready to use as supplied. Equilibrate to room temperature before use. Store at 4°C.

Standard: Prepared before use. Add 1 mL deionized water to a bottle, dissolve thoroughly, that is 1 mg/mL SiO_3^{2-} Standard. The remaining Standard can be stored at 4°C for 1 month.

0.03125 mg/mL SiO_3^{2-} Standard: Prepare 0.03125 mg/mL SiO_3^{2-} Standard by diluting 25 μL 1 mg/mL SiO_3^{2-} Standard into 775 μL deionized water. Using 0.03125 mg/mL SiO_3^{2-} Standard for subsequent detection.

Note: Always prepare fresh standards per use; Diluted Standard Solution is unstable and must be used within 4 h.

Sample Preparation

Note: Note: It is recommended to use fresh soil samples.

Fresh soil samples naturally air dried or air dried in an oven at 37°C and sieved through 20 mesh sieve. Weigh 0.2 g air-dried soil sample, add 1 mL Extraction Buffer, extract with vibration at 25°C for 1 h. Centrifuge at 10,000 g for 10 min at 25°C. Use supernatant for assay.

Assay Procedure

1. Preheat the microplate reader or visible spectrophotometer for more than 30 min, and adjust the wavelength to 700 nm, visible spectrophotometer was returned to zero with deionized water.

2. Operation table (The following operations are operated in the 96-well microplate or microglass cuvette):

Reagent	Test Well (μL)	Standard Well (μL)	Blank Well (μL)
Sample	40	0	0
0.03125 mg/mL Standard	0	40	0
Deionized Water	0	0	40
Reagent I	40	40	40
Mix well and incubate at 35°C for 15 min.			
Working Reagent II	40	40	40
Mix well and incubate at 25°C for 10 min.			
Reagent III	40	40	40
Working Reagent IV	40	40	40

Mix well and incubate at 25°C for 30 min, record the absorbance value at 700 nm. The Blank Well is recorded as A_{Blank} , the Standard Well is marked as A_{Standard} , and the Test Well is marked as A_{Test} . Finally calculate $\Delta A_{\text{Test}} = A_{\text{Test}} - A_{\text{Blank}}$, $\Delta A_{\text{Standard}} = A_{\text{Standard}} - A_{\text{Blank}}$.

Note: The Standard Well and Blank Well only need to be done once or twice. In order to guarantee the accuracy of

experimental results, need to do a pre-experiment with 2-3 samples. If ΔA_{Test} is less than 0.01, increase the sample quantity appropriately. If ΔA_{Test} is larger than 1.5, the sample can be appropriately diluted with Extraction Buffer, the calculated result multiplied by the dilution factor, or decrease the sample quantity appropriately.

Data Analysis

Note: We provide you with calculation formulae, including the derivation process and final formula. The two are exactly equal. It is suggested that the concise calculation formula in bold is final formula.

Calculation of the soil available silicon content

$$\text{Available silicon (mg/g soli)} = C_{\text{Standard}} \times \Delta A_{\text{Test}} \div \Delta A_{\text{Standard}} \times V_{\text{Total sample}} \div W = \mathbf{0.03125 \times \Delta A_{\text{Test}} \div \Delta A_{\text{Standard}} \div W}$$

C_{Standard} : 0.03125 mg/mL; $V_{\text{Total sample}}$: added Extraction Buffer volume, 1 mL; W : weight of sample, g.

Typical Data

The following data are for reference only. And the experimenters need to test the samples according to their own experiments.

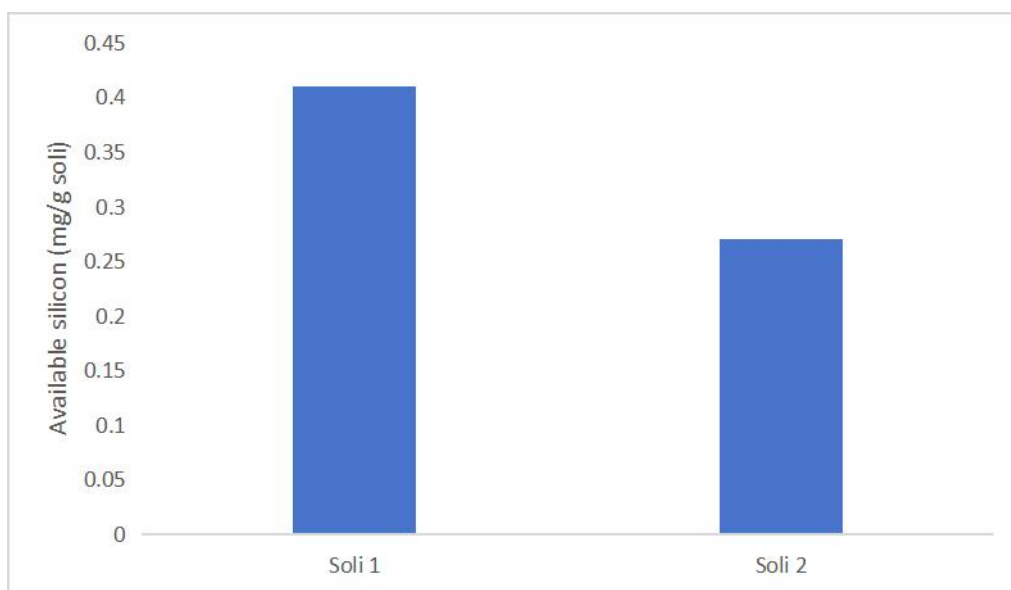


Figure 1. Determination of available silicon content in soli sample by this assay kit.

Recommended Products

Catalog No.	Product Name
KTb4012	CheKine™ Micro Soil Nitrate Nitrogen Assay Kit
KTb4014	CheKine™ Micro Acid Soil Available Phosphorous Assay Kit
KTb4041	CheKine™ Micro Soil Alkaline Phosphatase(S-AKP/ALP) Activity Assay Kit
KTb4050	CheKine™ Micro Soil Catalase (S-CAT) Activity Assay Kit

Disclaimer

The reagent is only used in the field of scientific research, not suitable for clinical diagnosis or other purposes. For your safety and health, please wear a lab coat and disposable gloves.