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CheKine™ Micro Plant Silicon Content Assay Kit

Cat #: KTB3018 Size: 48 T/48 S 96 T/96 S

	Micro Plant Silicon Content Assay Kit		
REF	**Cat #:** KTB3018	LOT	**Lot #:** Refer to product label
	Detection range: 0.05-2 mg/mL		**Sensitivity:** 0.05 mg/mL
	Applicable samples: Plant Tissues		
	Storage: Stored at 4℃ for 6 months, protected from light		

Assay Principle

Silicon is an important beneficial nutrient in plants and is even necessary in plants such as rice, sugar cane and horsetail. Determination of silicon content is an important indicator to evaluate the silicon nutrition status of plants and measure the level of silicon supply in soil. CheKine™ Micro Plant Silicon Content Assay Kit can be used to detect biological samples such as plant tissues. In the kit, plants can be mixed with NaOH solution and heated in a boiling water bath for one hour to dissolve amorphous SiO_2. Acid was added to the leaching solution to neutralize it, and silicon was determined by silica phase blue colorimetric method.

Materials Supplied and Storage Conditions

Kit components	Size		Storage conditions
	48 T	96 T	
Extraction Buffer	60 mL	120 mL	4℃
Reagent Ⅰ	15 mL	30 mL	4℃, protected from light
Reagent Ⅱ	Powder×1 vial	Powder×2 vials	4℃, protected from light
Reagent Ⅲ	2 mL	4 mL	4℃, protected from light
Standard	Powder×1 vial	Powder×1 vial	4℃

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 650 nm
- 96-well plate or microglass cuvette, precision pipettes, disposable pipette tips, 1.5 mL EP tube
- Water bath, centrifuge
- Deionized water, 20% acetate
- Homogenizer or mortar, 40-mesh sieve

Reagent Preparation

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

Reagent I: Ready to use as supplied; Equilibrate to room temperature before use; Store at 4℃, protected from light.

Working Reagent II: Prepared before use. Add 10 mL of deionized Water to each bottleto fully dissolve. Working Reagent I is freshly prepared.

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

Standard: Prepared before use. Add 1 mL deionized water to fully dissolve the standard to silicon solution of 2 mg/mL. Store at 4℃ for 1 month.

Standard preparation: Use the 2 mg/mL silicon standard solution and further dilute it to the standard as shown in the following table:

Num.	Standard Volume (μL)	Deionized Water (μL)	Concentration (mg/mL)
Std.1	100 μL 2 mg/mL Standard	0	2
Std.2	80 μL 2 mg/mL Standard	20	1.6
Std.3	60 μL 2 mg/mL Standard	40	1.2
Std.4	40 μL 2 mg/mL Standard	60	0.8
Std.5	20 μL 2 mg/mL Standard	80	0.4
Std.6	5 μL 2 mg/mL Standard	95	0.1
Std.7	2.5 μL 2 mg/mL Standard	97.5	0.05
Blank	0	100	0

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

Sample Preparation

Note: We recommend that you use fresh samples. If not assayed immediately, samples can be stored at -80℃ for one month.When measuring, the temperature and time of thawing should be controlled. When thawing at room temperature, the sample should be thawed within 4 h.

Plant tissue: Weigh 0.05 g tissue that was dried at 80℃ and has passed 40-mesh sieve, add 1 mL Extraction Buffer, extract at 95℃ for 1 h, naturally cooling to room temperature, mix well. Centrifuge at 10,000 g for 10 min at 25℃, and take the supernatant to be tested.

Assay Procedure

1. Preheat the microplate reader or visible spectrophotometer for more than 30 min, and adjust the wavelength to 650 nm. Visible spectrophotometer was returned to zero with deionized water.
2. Sample measurement. (The following operations are operated in 1.5 mL EP tube)

Reagent	Blank Well (μL)	Standard Well (μL)	Test Well (μL)
Sample	0	0	16
Standard	0	16	0
Deionized water	16	0	0
20% acetate	480	480	480

Reagent Ⅰ	160	160	160
Mix well, let stand at 25℃ for 5 min .			
Working Reagent Ⅱ	80	80	80
Reagent Ⅲ	16	16	16

3. Mix well, let stand at 25℃ for 20 min , add 200 μL in the 96-well plate or microglass cuvette, detect the absorbance at 650 nm. The Blank Well is recorded as A_{Blank}, the standard Well is marked as $A_{Standard}$, the Test Well is marked as A_{Test}. Finally calculate $\Delta A_{Test}=A_{Test}-A_{Blank}$, $\Delta A_{Standard}=A_{Standard}-A_{Blank}$.

Note: The Blank Well and the Standard Well only need to be done 1-2 times. 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 greater than 2 mg/mL of $\Delta A_{Standard}$, the sample can be appropriately diluted with deionized water, 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.

1. Drawing of standard curve

With the concentration of the standard solution as the x-axis and the $\Delta A_{Standard}$ as the y-axis, draw the standard curve and obtain the standard equation y=kx+b. The determination of ΔA_{Test} is brought into the equation to get x (mg/mL).

2. Calculation of the plant silicon content

Calculated by dry weight of samples

Plant silicon (mg/g dry weight)=$x\times V_{Standard}\div(V_{sample}\div V_{Total\ sample}\times W)$**=x÷W**

$V_{Standard}$:: The volume of the standard, 0.016 mL; V_{sample}: The volume of the sample in the reaction, 0.016 mL; $V_{Total\ sample}$: The volume of Extraction Buffer, 1 mL; W: Sample weight, g

Typical Data

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

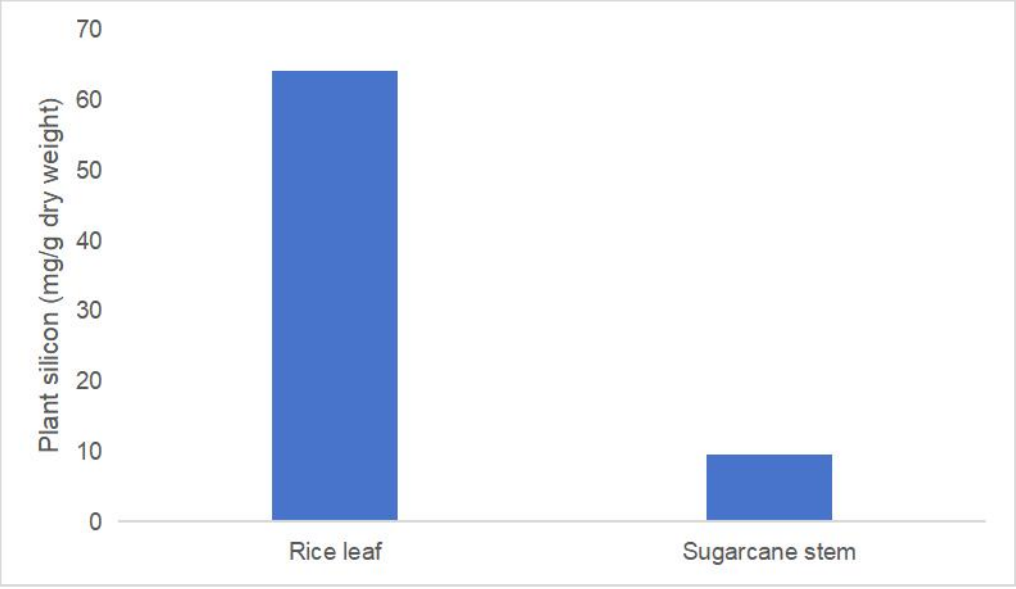

Figure 1. Determination of silicon content in rice leaf and sugarcane stem by this kit.

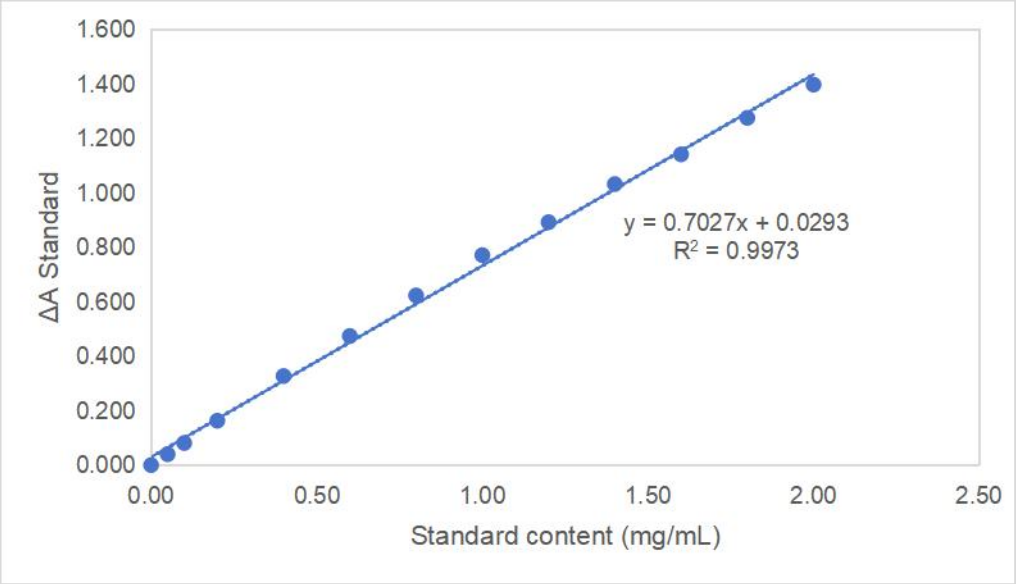

Figure 1. Standard curve of plant silicon content.

Recommended Products

Catalog No.	Product Name
KTB1030	CheKine™ Micro Superoxide Dismutases (SOD) Activity Assay Kit
KTB1040	CheKine™ Micro Catalase (CAT) Activity Assay Kit
KTB1110	CheKine™ Lactate Dehydrogenase (LDH) 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.