CheKine™ Micro Soil Organic Carbon (SOC) Content Assay Kit

Cat #: KTB4039 Size: 48 T/48 S 96 T/96 S

	Micro Soil Organic Carbon (SOC) Content Assay Kit		
REF	**Cat #:** KTB4039	LOT	**Lot #:** Refer to product label
	Detection range: 0.24%-2.88%		**Sensitivity:** 0.24%
	Applicable sample: Soli		
	Storage: Stored at 4℃ for 6 months, protected from light		

Assay Principle

The concept of soil organic carbon (SOC) refers to the carbon content in humus, animal and plant residues and microorganisms formed by microbial action, which is called soil organic carbon (SOC). Soil organic carbon can be divided into easily decomposed organic carbon, refractory organic carbon and inert organic carbon according to the availability of microorganisms. Those who are easy to decompose have higher bioavailability and loss rate, while those who are difficult to decompose have higher residual rate, which generally accounts for 60%-80% of soil organic matter. And a considerable part of it participates in the formation of humus. CheKine™ Micro Soil Organic Carbon (SOC) Content Assay Kit can detect biological samples such as soli. In this kit, under the heating condition, the organic carbon in the soil sample is oxidized by excessive potassium dichromate-sulfuric acid solution, and the hexavalent chromium (Cr^{6+}) in the potassium dichromate is reduced to trivalent chromium (Cr^{3+}), and its content is directly proportional to the organic carbon content in the sample. The absorbance is measured at the wavelength of 585nm, and the organic carbon content is calculated according to the trivalent chromium (Cr^{3+}) content.

Materials Supplied and Storage Conditions

Kit components	Size		Storage conditions
	48 T	96 T	
Reagent Ⅰ	Powder×2 vials	Powder×4 vials	4℃, protected from light
Standard	Powder×2 vials	Powder×2 vials	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 585 nm
- 96-well microplate or microglass cuvette, precision pipettes, disposable pipette tips,1.5 mL EP tube
- Water bath, centrifuge, digestion apparatus, digestion tubes, glass bottles, 30-50 mesh sieve
- Deionized water, concentrated sulfuric acid

Reagent Preparation

Working Reagent Ⅰ: Prepared before use. Add 35 mL of deionized water to each bottle, dissolve the contents thoroughly, and transfer the solution to a beaker. Slowly add 35 mL of concentrated sulfuric acid while continuously mixing. Ensure the mixture is well homogenized. Allow the solution to cool before use. Store the glass bottles in a dark place to avoid light exposure. Prepare fresh before use.

Reagent Ⅱ: Prepared before use. According to the dosage, concentrated sulfuric acid and deionized water are added into deionized water according to the ratio of 1: 183, and fully mixed. **(Not prepared but required)**

Note: Reagent Ⅰ and Reagent Ⅱ are corrosive and have a pungent odor, so it is recommended to experiment in a fume hood.

Standard: Prepared before use. Add 10 mL deionized water to a bottle, dissolve thoroughly, that is 4 mg/mL organic carbon standard solution. The remaining reagent can be stored at 4℃ for 2 week. Using 4 mg/mL organic carbon standard solution, and further dilute the standard according to the table below:

Num.	Standard Volume (μL)	Deionized Water (μL)	Concentration (mg/mL)
Std.1	864 μL of 4 mg/mL Standard	336	2.88
Std.2	576 μL of 4 mg/mL Standard	624	1.92
Std.3	288 μL of 4 mg/mL Standard	912	0.96
Std.4	144 μL of 4 mg/mL Standard	1,056	0.48
Std.5	72 μL of 4 mg/mL Standard	1,128	0.24
Blank	0	1,200	0

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.

Dry the fresh soil sample either naturally or in an oven at 37℃. After drying, sieve the soil through a 30-50 mesh sieve.

Assay Procedure

1. Preheat the microplate reader or visible spectrophotometer for more than 30 min, and adjust the wavelength to 585 nm, visible spectrophotometer was returned to zero with deionized water.

2. Operation table (The following operations are operated in the digestion tubes):

Reagent	Blank Tube	Standard Tube	Test Tube
Sample (g)	0	0	0.1
Standard (mL)	0	1	0
Deionized Water (mL)	1	0	0
Working Reagent Ⅰ (mL)	2	2	2
Place the samples in the digestion apparatus and digest at 150℃ for 30 min, allow the samples to cool to room temperature naturally before proceeding to the next step			
Reagent Ⅱ(mL)	9	9	10

Mix thoroughly, then take 1 mL of the mixed solution. Centrifuge at 8,000 g for 10 min at 25℃, take 200 μL supernatant into 96-well microplate or microglass cuvetteAfter centrifugation, record the absorbance value at 585 nm. The Blank Tube is recorded

as A_{Blank}, the Standard Tube is marked as $A_{Standard}$, the Test Tube is marked as A_{Test}. Finally calculate $\Delta A_{Test}=A_{Test}-A_{Blank}$, $\Delta A_{Standard}=A_{Standard}-A_{Blank}$.

Note: The Standard Tube and Blank Tube 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 2.88 mg/mL of $\Delta A_{Standard}$, 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. The determination of ΔA_{Test} is brought into the equation to get x (mg/mL).

2. Calculation of SOC content

SOC (%)=x÷W÷1,000×100**=0.1x÷W**

W: Sample weight, g; 1,000: Conversion Factor, 1 g=1,000 mg

Typical Data

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

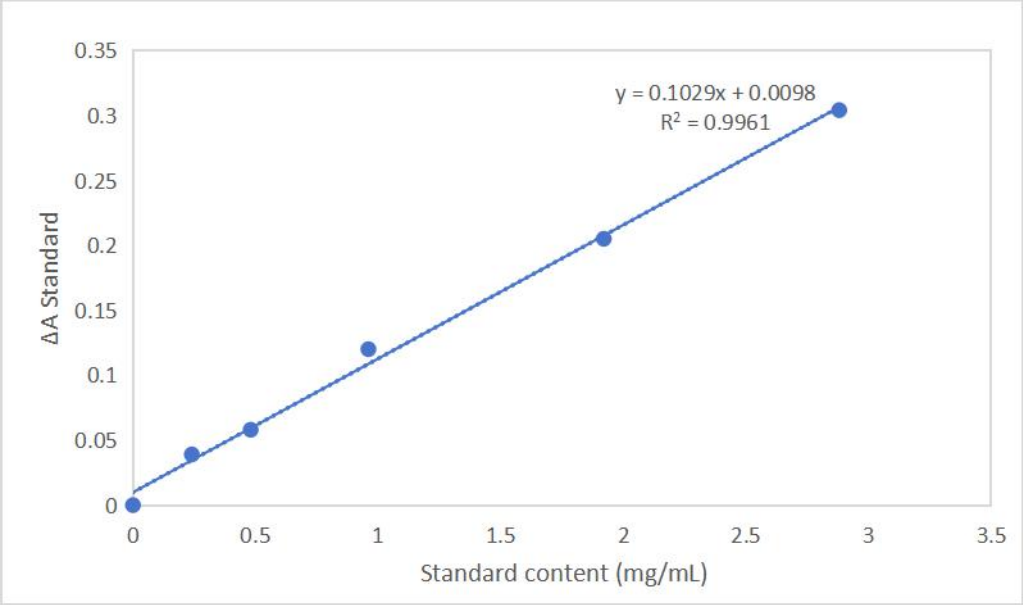

Figure 1. Standard curve.

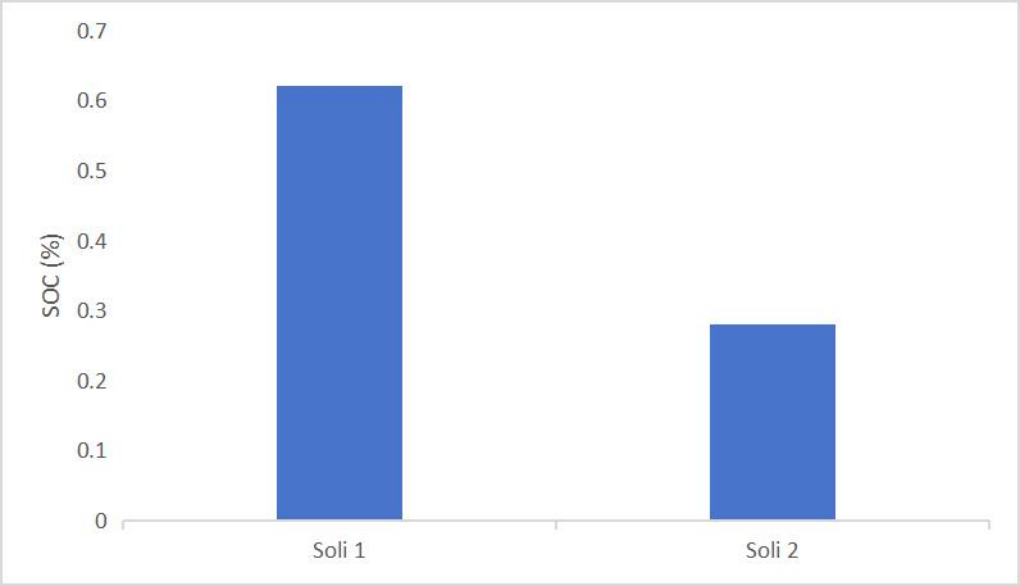

Figure 2. Determination SOC content in soli sample by this assay kit.

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.