



CheKine™ Micro Soil Organic Matter (SOM) Content Assay Kit

Cat #: KTB4035

Size: 48 T/48 S

96 T/96 S

	Micro Soil Organic Matter (SOM) Content Assay Kit		
REF	Cat #: KTB4035	LOT	Lot #: Refer to product label
	Detection range: 0.41%-4.96%		Sensitivity: 0.41%
	Applicable sample: Soli		
	Storage: Stored at 4°C for 6 months, protected from light		

Assay Principle

Soil Organic Matter (SOM) refers to the carbon-containing organic materials present in the soil. It includes various residues of animals and plants, microbial bodies, and a variety of organic substances produced through decomposition and synthesis processes. Soil organic matter is an important component of the soil solid phase, and its content level is one of the key indicators for assessing soil fertility. It plays a crucial role in soil formation, soil fertility, environmental protection, and the sustainable development of agriculture and forestry. CheKine™ Micro Soil Organic Matter (SOM) Content Assay Kit can detect biological samples such as soli. In this kit, under heated conditions, the organic matter in the soil sample is oxidized by an excess potassium dichromate-sulfuric acid solution. During this process, hexavalent chromium (Cr^{6+}) in potassium dichromate is reduced to trivalent chromium (Cr^{3+}). The amount of Cr^{3+} produced is directly proportional to the organic matter content in the sample. Absorbance is measured at 585 nm, and the organic carbon content is calculated based on the amount of Cr^{3+} .

Materials Supplied and Storage Conditions

Kit components	Size		Storage conditions
	48 T	96 T	
Reagent I	Powder×2 vials	Powder×4 vials	4°C, protected from light
Standard	Powder×2 vials	Powder×2 vials	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 585 nm
- 96-well microplate or microglass cuvette, precision pipettes, disposable pipette tips, 1.5 mL EP tube
- Water bath, centrifuge, digestion apparatus, 15 mL 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°C 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°C. 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 15 mL 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°C 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°C, take 200 µL supernatant into 96-well microplate or microglass cuvette After centrifugation, record the absorbance value at 585 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 $\Delta A_{\text{Test}} = A_{\text{Test}} - A_{\text{Blank}}$, $\Delta A_{\text{Standard}} = A_{\text{Standard}} - A_{\text{Blank}}$.

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 $\Delta A_{\text{Standard}}$, 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 $\Delta A_{\text{Standard}}$ 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 SOM content

$$\text{SOM (\%)} = x \div W \times 1.724 \div 1,000 \times 100 = \mathbf{0.1724x \div W}$$

1.724: Conversion factor from organic carbon to organic matter; 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.

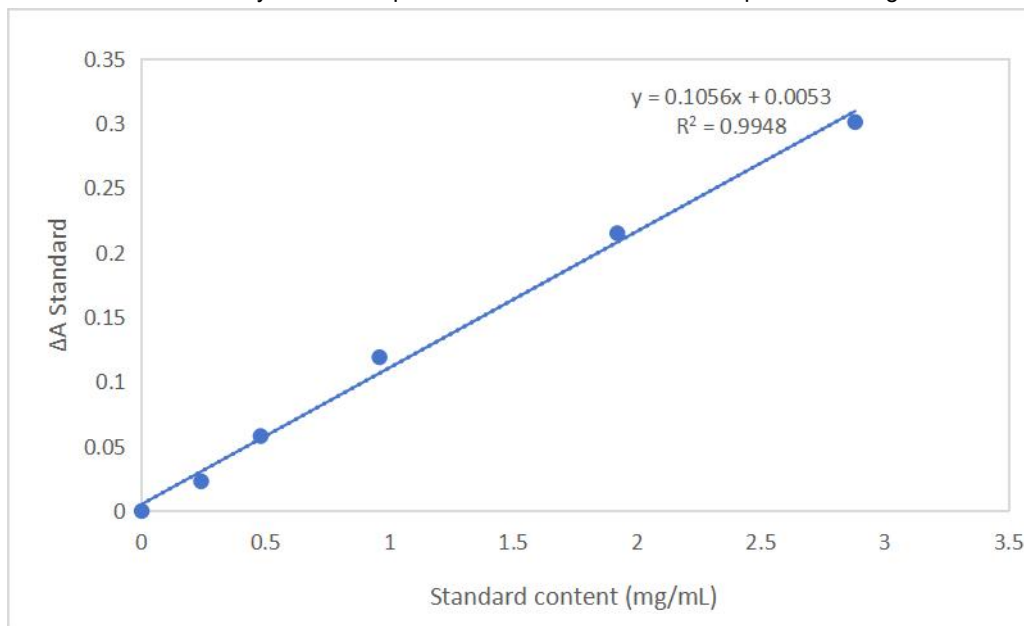


Figure 1. Standard curve.

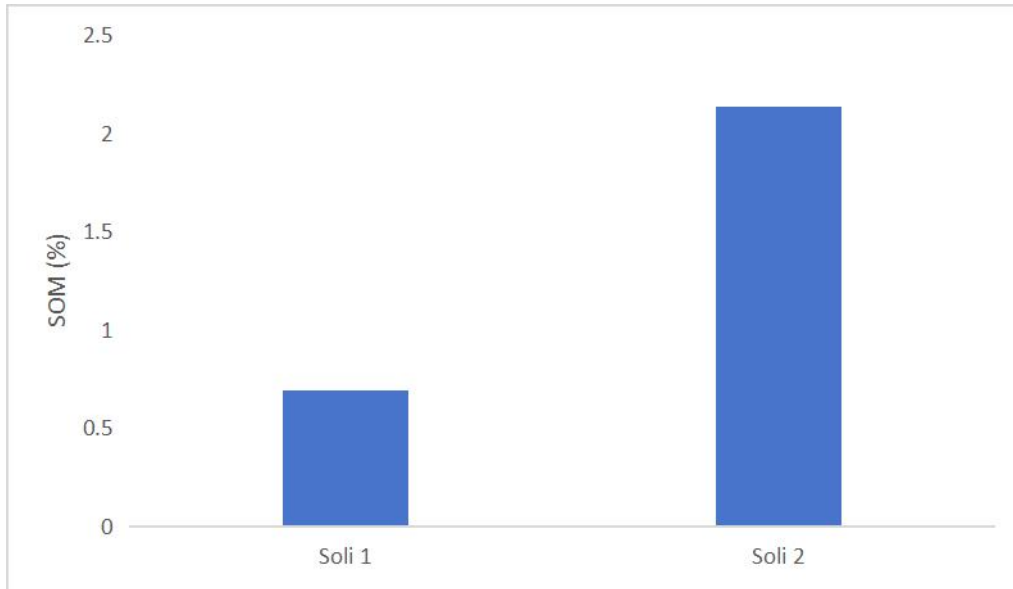


Figure 2. Determination SOM content in soli sample by this assay kit.

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.