Soil Total Phenolics (TP) Content Assay Kit

(Colorimetric Method)

S1521999

Storage 2~8℃, Store in the dark (For detailed storage conditions, please refer to the Kit Components).

Shipping Shipped with ice packs, Avoid freezing, Please store under the specified storage conditions immediately upon receipt.

Introduction:

The phenolic substances in the soil are mainly released by plants and produced by the decomposition of plant residues and fallen leaves. Due to the difficulty in their degradation, the accumulation of phenolic substances in the soil can affect the carbon-nitrogen transformation and greenhouse gas emissions of the soil, thereby causing a decline in soil fertility. Back. In addition, phenolic substances also have significant effects on the mineralization of soil organic matter and the nutrient cycle. This kit uses the Folin phenol method to determine the content of phenolic substances in the soil. Under alkaline conditions, phenolic substances will reduce tungsten molybdate, generating a blue compound. There is a characteristic absorption peak at 750 nm. By detecting the absorbance value at 750 nm, the content of phenolic substances in the soil can be calculated.

Kit Contents:

S1521999	Components	Appearance	48T	Storage	Quantity Per Test
S1521999A	Extraction Solution	Colorless clear liquid	60 mL	2-8℃. Store in the dark	1 mL for 1 reaction
S1521999B	Reagent 1	Yellow liquid	25 mL	2-8℃. Store in the dark	450 μL for 1 reaction
S1521999C	Reagent 2	Colorless clear liquid	5 mL	2-8℃	90 μL for 1 reaction
S1521999D	Standard Sample	White powder	10 mg	2-8℃	Use as per requirements

Required instruments and supplies:

Visible spectrophotometer, 1 mL glass cuvette (with a path length of 0.4 cm), adjustable pipette, balance, centrifuge.

Determination of total phenolic content in soil:

It is recommended to select 2 samples for prediction before the formal experiment. This will help us understand the situation of this batch of samples, familiarize ourselves with the experimental process, and avoid waste of experimental samples and reagents!

1. Sample preparation:

Take approximately 0.5 g of soil sample, add 1 mL of extraction solution, and shake at room temperature for 30 minutes. Centrifuge at 25℃ and 8000 rpm for 10 minutes, then take the supernatant for testing.

2. Machine testing:

(1) The spectrophotometer was preheated for 30 minutes, the wavelength was adjusted to 750 nm, and distilled water was used for zero adjustment.

(2) Add the following substances in sequence to the EP tube:

Reagent Name (μL)	Testing tube	Blank tube (used only once)
Sample	180	-
Distilled water	-	180
Reagent 1	450	450
Reagent 2	90	90

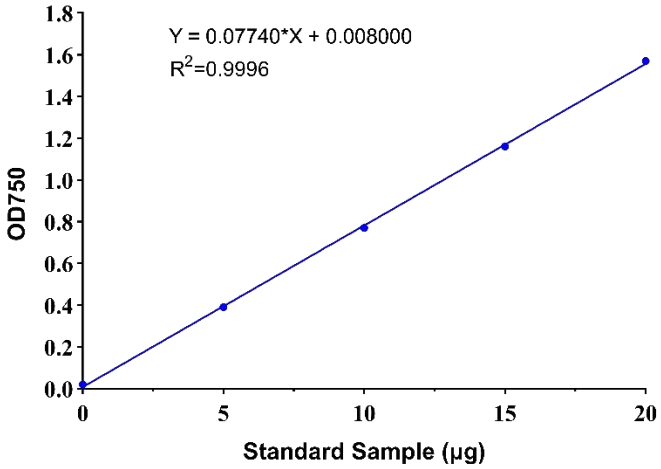
Mix well, let it stand at room temperature (25℃) for 30 minutes. Transfer all the liquid to a 1 mL glass cuvette (with a path length of 0.4 cm). Measure the absorbance at 750 nm as A, and calculate $\triangle A = A_{(measured)} - A_{(blank)}$

[Note]:

1. If absorbance ΔA > 1.2, dilute the supernatant with distilled water before re-testing; multiply the final result by dilution factor D during calculation.
2. If ΔA is close to zero, increase soil sample mass W or raise sample loading volume V_1 (e.g., increase to 300 μL; reduce Reagent I volume accordingly to maintain total reaction volume). Substitute the adjusted W and V_1 into the calculation formula for result computation.

Result Calculation:

1. Standard curve: Y = 0.07740* X + 0.008000, where X represents the mass of the standard sample (in μg) and Y represents ΔA.



2. Total phenol content in soil (μg/g soil) = (ΔA - 0.008000) ÷ 0.07740 ÷ (V1 ÷ V × W) × D
   V---Volume of the extracted liquid, 1 mL;
   D---Dilution factor, 1 for undiluted sample;
   V1---Volume of the sample in the reaction, 0.18 mL;
   W---Mass of soil sample, g.

Appendix Procedure for preparing the standard curve:

1. Prepare standard stock solution (10 mg/mL): Add 1 mL distilled water to the standard powder vial, sonicate until fully dissolved.
2. Dilute the standard stock solution with distilled water to obtain a 1 mg/mL standard dilution. Then, follow the procedures in the table below to dilute it to the corresponding standard dilution. When 180 μL is used for sample loading, this will be the loading volume for the corresponding standard curve.

Operation Table:

	①	②	③	④
Target loading amount (μg)	5	10	15	20
1 mg/mL standard dilution solution (μL)	20	40	60	80
Distilled water (μL)	700	680	660	640

3. Operate following the pipetting protocol for test tubes above, then plot the standard curve using recorded absorbance values.