

## Soil Polyphenol Oxidase (S-PPO) Assay Kit

**Note:** Take two or three different samples for prediction before test.

**Operation Equipment:** Microplate reader/Spectrophotometer

**Catalog Number:** AK0593

**Size:**100T/96S

### Components:

Solution I: Powder  $\times 1$ . Dissolve with 12 mL of distilled water each bottle before using, and unused liquid can be stored at 4°C .

Solution II : Liquid 5 mL $\times 1$ . Storage at 4°C .

Solution III: Liquid 50 mL $\times 1$ .Ether. Storage at 4°C (Self-prepared reagent).

Standard solution of potassium dichromate: Liquid 10 mL $\times 1$ . The potassium dichromate solution (5 mmol/L) is equivalent to 0.2 mg/mL purple gallic acid solution.

### Product Description

Soil Polyphenol Oxidase (S-PPO) mainly comes from the decomposition and release of soil microorganisms, plant root secretions as well as animals and plants residues. S-PPO catalyzes the oxidation of aromatic compounds into quinone in soil. Quinone reacts with proteins, amino acids, sugars, minerals and other substances in soil to generate organic matters and pigments. Therefore, S-PPO enables the soil to complete the cycle of aromatic compounds and be used for soil environmental restoration.

S-PPO is able to catalyzes the pyrogallol to produce purple gallic acid, which has characteristic absorption peak at 430 nm.

### Reagents and Equipment Required but Not Provided.

Table centrifuge, water-bath, transferpettor, micro glass cuvette/96 well flat-bottom plate, spectrophotometer/microplate reader, Ether (express delivery is not allowed), ice and distilled water.

### Procedure

#### I. Sample processing:

Fresh soil samples are naturally air-dried or oven to dry at 37°C, then sieved by 30 ~ 50 mesh sieve.

#### II. Determination procedure:

1. Preheat spectrophotometer/ microplate reader for 30 minutes, adjust the wavelength to 430 nm, set zero with the Solution III.
2. Standard: Dilute the standard solution to 0.2, 0.1, 0.05, 0.025, 0.0125, 0.00625, 0.003125 and 0 mol/mL standard with the 0.5 mol/L hydrochloric acid.
3. Establishment of standard curve:  
Take 0.2 mL diluted standard solution into a cuvette or 96 well plate, measure the absorbance value A at 430nm, and make the standard curve according to the absorbance (x, minus the absorbance value of 0) and the concentration (y, mg/mL).

#### 4. Sample list

Reagent	Test Tube
Air-dried soil sample(g)	0.02
Solution I(μL)	120
Shake and mix thoroughly, then incubate at 30°C for 1 h	
Solution II (μL)	50
Solution III(μL)	430

Shake several times at room temperature for 30 minutes, take 1 mL of supernatant to measure the absorbance value A at 430 nm.

#### Calculate Activity of S-PPO

According to the standard curve, substitute the absorbance value A(x) of the sample into the formula to calculate the sample concentration y (mg/mL).

Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the production of 1 mg of purple gallic acid per day at 30°C every gram soil

$$\text{S-PPO (U/g soil sample)} = y \times V_{\text{ST}} \div W \div T = 516 \times y$$

T: Reaction time, 1 h=1/24 d;

$V_{\text{ST}}$ : Extract solution volume, 0.43 mL;

W: Sample quality, 0.02 g.

#### Note:

Ether is volatile. It is recommended not to measure too many samples at one time when transferring to the microplate.

#### Recent Product Citations:

[1] B Li, Y Ding, X Tang, et al. MTA1 promotes the invasion and migration of pancreatic cancer cells potentially through the HIF- $\alpha$ /VEGF pathway. *Journal of Receptor and Signal Transduction Research*. August 2018;(IF2.998)

#### References:

[1] Montgomery M W, Sgarbieri V C. Isoenzymes of banana polyphenol oxidase[J]. *Phytochemistry*, 1975, 14(5-6): 1245- 1249.

[2] Dogan S, Dogan M. Determination of kinetic properties of polyphenol oxidase from *Thymus* (*Thymus longicaulis* subsp. *chaubardii* var. *chaubardii*)[J]. *Food chemistry*, 2004, 88(1): 69-77.

#### Related Products:

AK0566/AK0565 Soil Alkaline Phosphatase (S-AKP/ALP) Activity Assay Kit

AK0591/AK0591 Soil Urease (S-UE) Activity Assay Kit

AK0590/AK0589 Soil Acid Phosphatase (S-ACP) Activity Assay Kit