Soil aryl sulfatase (S-ASF) Activity Assay Kit

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

Operation Equipment: Spectrophotometer

Catalog Number: NA0368

Size:50T/24S

Components:

Reagent I: 3 mL×1, Toluene (Provide for oneself). stored at 4℃.

Reagent II: 30 mL×1. Storage at 4℃.

Reagent III: Powder×2. Storage at -20℃. Before use, add 10 mL of distilled water into each bottle, fully dissolve it for standby. The reagents that cannot be used up can be packed separately and stored at -20℃ to avoid repeat freezing and thawing.

Reagent IV: 60 mL×1. Storage at 4℃

Standard: 1 mL×1. 5 mmol/L of p-nitrophenol solution. Dilute the standard 50 times with Reagent II to obtain 100 μmol/L standard solution before use.

Product Description

Soil aryl sulfatase come from soil microorganism, which can catalyze the transformation of soil organic sulfide into plant absorbable inorganic sulfur. It plays an important role in the biochemical cycle of sulfur and sulfur nutrition metabolism of plants, and it is an important biological index reflecting soil quality.

S-ASF can catalyzes the formation of p-nitrophenol from p-nitrobenzenesulfate, which has characteristic light absorption at 410 nm.

Reagents and Equipment Required but Not Provided.

Spectrophotometer, table centrifuge, water-bath, transferpettor, 1 mL glass cuvette, mortar, ice, 30-50 mesh sieve (or smaller), toluene (express delivery is not allowed) and distilled water.

Procedure

I. Sample processing:

The fresh soil samples are dried naturally or in the oven at 37℃ and passed with 30-50 mesh.

II. Determination steps:

1. Preheat spectrophotometer for 30 minutes, adjust the wavelength to 410 nm, set zero with the distilled water.

2. Add reagents in turn according to the following table:

Reagent name	Test tube(T)	Contrast tube(C)	Standard tube(S)	Blank tube(B)
Air dried soil sample (g)	0.1	0.1	-	-
Reagent I (μL)	50	50	-	-
Shake and mix well, make the soil sample all wet, and place it			-	-

at room temperature for 15 minutes.				
Reagent II (µL)	500	500	-	-
Reagent III (µL)	400	-	-	-
Mix well, after reacting at water bath for 1 hours at 37°C, immediately boil for 5 minutes (cover tightly to prevent water loss), and cool in water/ice bath.			-	-
Reagent III (µL)	-	400	-	-
Centrifugate at 10000 rpm for 1 minutes at 25°C, take the supernatant.			-	-
Supernatant (µL)	500	500	-	-
Standard (µL)	-	-	500	-
Distilled water (µL)	-	-	-	500
Reagent IV(µL)	1000	1000	1000	1000

Mix well. After standing at room temperature for 2 min, measure the absorbance value(A). Record it as A_T, A_C, A_S and A_B respectively. Calculate $\Delta A = A_T - A_C$, $\Delta A_S = A_S - A_B$. Each test tube is provided with contrast tube.

III. Calculate activity of S-ASF

Unit definition: One unit of enzyme activity is defined as the amount of enzyme that catalyzes the production of 1 µmol of p-nitrophenol per day every gram soil sample.

$$\text{S-ASF (U/g soil sample)} = \Delta A \div (\Delta A_S \div C_S) \times V_{RT} \div W \div T = 2.28 \times \Delta A \div \Delta A_S \div W$$

T: Reaction time, 1 hour=1/24 day;

V_{RT}: Total volume of reaction system: 9.5×10^{-4} L;

C_S: Concentration of standard solution, 100 µmol/L;

W: Sample quality, g.

Experimental examples:

1. Take two tubes of 0.1g clover soil and mark them as test tube and control tube respectively, and follow the measurement procedure. Calculate $\Delta A = A_T - A_C = 0.627 - 0.108 = 0.519$, $\Delta A_S = A_S - A_B = 0.568 - 0.002 = 0.566$. The enzyme activity is calculated according to the sample mass.
   S-ASF (U/g soil sample) $= 2.28 \times \Delta A \div \Delta A_S \div W = 20.9067$ U/g.

2. Take two tubes of 0.1g soil sample and mark them as test tube and control tube respectively, and follow the measurement procedure. Calculate $\Delta A = A_T - A_C = 0.442 - 0.102 = 0.34$, $\Delta A_S = A_S - A_B = 0.568 - 0.002 = 0.566$. The enzyme activity is calculated according to the sample mass.
   S-ASF (U/g soil sample) $= 2.28 \times \Delta A \div \Delta A_S \div W = 13.69611$ U/g.

Related products:

NA0361/NA0360   Soil β-1,4-Glucanase Activity Assay Kit

NA0371/NA0362   Soil Leucine Arylamidase(S-LAP) Activity Assay Kit

NA0850/NA0608   Soil Saccharase(S-SC) Activity Assay Kit

NA0644/NA0402   Soil Nitrate Reductase(S-NR) Activity Assay Kit