

Soil β -glucosidase (S- β -GC) Activity Assay Kit

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

Operation Equipment: Spectrophotometer

Catalog Number: BC0160

Size: 50T/24S

Components:

Reagent I: Methylbenzene, liquid 5 mL \times 1. Storage at 4°C. Required but not provided.

Reagent II: Powder \times 2. Storage at -20°C. Add 10 mL of distilled water to per bottle before use and dissolve it fully. The left reagent store at -20°C.

Reagent III: Liquid 40 mL \times 1. Storage at 4°C.

Reagent IV: Liquid 80 mL \times 1. Storage at 4°C.

Standard: Liquid \times 1, 5 mmol/L p-nitrophenol solution.

Preparation of standard samples: Take 100 μ L of standard solution and add it to 400 μ L of Reagent III to get 1 mmol/L standard solution. Dilute the 1 mmol/L standard solution for 10 times to 100 μ mol/L.

Product Description

Soil β -glucosidase (S- β -GC) can catalyze the hydrolysis of glycoside bonds between aryl or hydroxyl groups and glycosylated atomic groups to generate glucose. It is an important component of cellulose decomposition enzyme system and has important physiological functions in the carbohydrate metabolism of soil microorganisms.

S- β -GC can catalyze the p-nitrophenyl- β -D-glucopyranoside to p-nitrophenol. The product is slightly yellow and has characteristic of absorption at 400 nm.

Reagents and Equipment Required but Not Provided

Table centrifuge, water-bath, transferpettor, spectrophotometer, 1 mL glass cuvette, ice, 30 mesh sieve (or smaller), methylbenzene (express delivery is not allowed) and distilled water.

Preparation

I. Sample processing:

Air dry the fresh soil sample naturally or in an oven at 37°C, and sieve it through 30~50 meshes.

II. Determination procedure:

1. Preheat the spectrophotometer for more than 30 minutes, adjust the wavelength to 400 nm, set zero with distilled water.
2. Dilute it to 50, 25, 12.5, 6.25 μ mol/L with the distilled water. Detect the standard solutions of 100, 50, 25, 12.5 and 6.25 μ mol/L.
3. Add reagents with the following list:

Reagent	Test Tube (T)	Contrast Tube (C)	Standard Tube (S)	Blank Tube (B)
Air-dried soil sample (g)	0.05	0.05	-	-
Reagent I (μL)	25	25	-	-
The soil samples are all wetted by oscillating mixing and store at room temperature for 15 minutes.				
Reagent II (μL)	400	-	-	-
Reagent III (μL)	500	500	-	-
Mix thoroughly and incubate the reaction for 1 hour at 37 °C water bath, then take the reaction solution in a boiling water bath for 5 minutes immediately (tightly close to prevent moisture loss), flowing water to cool.				
Reagent II (μL)	-	400	-	-
Mix thoroughly, centrifuge at 10000 ×g for 10 minutes at room temperature and take the supernatant.				
Supernatant (μL)	500	500	-	-
Standard (μL)	-	-	500	-
Distilled water (μL)	-	-	-	500
Reagent IV (μL)	1000	1000	1000	1000

Mix thoroughly and stand at room temperature for 2 minutes. Detect the absorbance of each tube at 400nm and noted as A_T , A_C , A_S and A_B . Calculate $\Delta A = A_T - A_C$. Each test tube should be provided with one contrast tube.

Calculation

Standard curve established: According to the concentration of the standard tube (y) and absorbance $\Delta A = A_S - A_B$ (x), establish standard curve. According to standard curve, take the ΔA (x) to the equation to acquire the sample concentration (μmol/L).

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

$$S\text{-}\beta\text{-GC (U/g soil sample)} = y \times V_{ra} \div W \div T = 0.444 \times y$$

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

V_{ra} : Total volume of the reaction system, 9.25×10^{-4} L;

W: Sample weight, 0.05 g.

References

[1] Dick W A, Thavamani B, Conley S, et al. Prediction of β -glucosidase and β -glucosaminidase activities, soil organic C, and amino sugar N in reflectance spectroscopy[J]. Soil Biology & Biochemistry, 2013, 56(9): 9e104.

[2] Sestelo A B F, Poza M, Villa T G. β -Glucosidase activity in a Lactobacillus plantarum wine strain[J]. World Journal of Microbiology and Biotechnology, 2004, 20(6): 633.

Related Products:

BC0280/BC0285 Soil Alkaline Phosphatase(S-AKP/ALP) Activity Assay Kit
BC0110/BC0115 Soil Polyphenoloxidase Activity Assay Kit
BC4040/BC4045 Soil Neutral Invertase (S-NI) Activity Assay Kit
BC4030/BC4035 Soil β -1,4-Glucanase Activity Assay Kit
BC4010/BC4015 Soil β -Xylosidase (S- β -XYS) Activity Assay Kit