Solid-β-Glucosidase(S-β-GC) Activity Assay Kit

Product Code: 67042

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

Product Information

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Method: Spectrophotometric method

S-β-GC catalyzes the hydrolysis of glycosidic bonds between aryl or alkyl groups and glycosyl moieties to generate glucose. It is an important component of the cellulolytic enzyme system and plays an important physiological role in soil microbial carbohydrate metabolism.

S-β-GC catalyzes p-nitrophenyl-β-D-glucopyranoside to generate p-nitrophenol, which has characteristic absorbance at 400 nm.

Package Contents and Storage

Code	Item	Quantity	Storage
67042.1	Reagent 1	9 mg × 2 bottles	-20°C, protected from light
67042.2	Reagent 2	25 mL	2-8°C
67042.3	Reagent 3	50 mL	2-8°C
67042.m	Instruction manual	1 copy	/

Toluene must be prepared separately.

Quality Standards and Safety Information

Raw Material or Packaging Name	Quality Standard	Main Toxicity
Reagent 1	--	--
Reagent 2	--	--
Reagent 3	--	--

Transportation and Storage

Transportation: This product is transported with ice packs.

Storage: Store according to the instructions in this manual. Shelf life: 180 days.

Instructions for Use

Sample Preparation

1. Air-dry fresh soil samples naturally or dry them in a 37°C oven.
2. Pass the dried soil samples through a 30-50 mesh sieve.

Instrument Preparation

1. Preheat the spectrophotometer for more than 30 minutes.
2. Set the wavelength to 400 nm.

Reagent Preparation

Before use, add 6 mL double-distilled water to each bottle of Reagent 1. After use, store any unused solution at -20°C.

Assay Procedure

Use a 1 mL glass cuvette. Add the samples and reagents according to the table below.

Component	Assay Tube	Control Tube
Air-dried soil sample	0.05 g	0.05 g
Toluene	25 μL	25 μL

Shake and mix thoroughly to moisten the soil sample, then place at room temperature for 15 minutes.

Component	Assay Tube	Control Tube
Reagent 1	400 μL	-
Reagent 2	500 μL	500 μL
Distilled water	-	400 μL

Mix thoroughly and incubate in a 37°C water bath for 1 hour. Immediately incubate in a 90°C water bath for 5 minutes. Cap tightly to prevent water loss.

Cool under running water, then centrifuge at 10000 g at room temperature for 10 minutes. Collect the supernatant.

Component	Assay Tube	Control Tube
Supernatant	500 μL	500 μL
Reagent 3	1000 μL	1000 μL

Mix thoroughly and let stand at room temperature for 2 minutes. Zero the spectrophotometer with the control tube, then measure the absorbance value A at 400 nm.

Calculation

The regression equation measured under standard conditions is:

$y = 0.0032x - 0.0027$

In this equation, x is the standard concentration in μmol/L, and y is the absorbance value.

One unit of enzyme activity is defined as the production of 1 μmol p-nitrophenol per g of soil sample in 24 hours.

Soil β-glucosidase activity:

Soil β-glucosidase activity (U/g soil sample) = (A + 0.0027) ÷ 0.0032 ÷ reaction time (1/24 h) × total reaction volume (0.925 mL) ÷ sample mass (0.05 g) ÷ 1000

Soil β-glucosidase activity (U/g soil sample) = 138.7 × (A + 0.0027)

Where:

- T: reaction time, 1 h = 1/24 d
- V total reaction: total volume of the reaction system, 9.25×10^{-4}L
- W: sample mass, 0.05 g

Precautions

1. Items to be prepared by the user: visible spectrophotometer, benchtop centrifuge, water bath, adjustable pipettes, 1 mL glass cuvette, toluene, and distilled water.
2. Before the formal assay, select 2-3 samples with large expected differences for a preliminary assay.
3. This 50T kit can test 24 samples.