

Soil Saccharase (S-SC) Activity Assay Kit

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

Operation Equipment: Spectrophotometer/ Microplate Reader

Catalog Number: BC0245

Size: 100T/48S

Product Composition: Before use, please carefully check whether the volume of the reagent is consistent with the volume in the bottle. If you have any questions, please contact Solarbio staff in time.

Reagent name	Size	Preservation Condition
Reagent I	Self-supplied reagent	2-8°C
Reagent II	Liquid 7.5 mL×1	2-8°C
Reagent III	Powder×2	2-8°C
Reagent IV	Liquid 30 mL×1	2-8°C
Standard	Powder×1	2-8°C

Solution Preparation:

1. Reagent I: Self-supplied toluene.
2. Reagent III: Dissolve with 11 mL of distilled water one of the bottle before using, and unused liquid can be stored at 2-8°C for one weeks.
3. Standard: Containing 10 mg of anhydrous glucose (dry weight loss<0.2%). Dissolve the standard with 1 mL of distilled water to generate a 10 mg/mL glucose solution standard, store at 2-8°C and use within two weeks or dissolve the standard with saturated benzoic acid solution stored for a longer time.

Product Description:

Soil Saccharase (S-SC) can hydrolyze saccharose into corresponding monosaccharides and can be absorbed by the body. The enzymatic product is an important index for evaluating soil fertility, which is closely related to the content of organic matter, nitrogen and phosphorus in soil, the number of microorganisms and soil respiration intensity.

S-SC catalyzes saccharose to form reduced sugar. The reduced sugar can react with 3,5-dinitrosalicylic acid to form a brownish red amino complex which can be detected by colorimetric assay at 540 nm. In this kit, the soil saccharase activity can be determined by measuring the color depth at 540 nm indirectly.

Reagents and Equipment Required but Not Provided:

Spectrophotometer/microplate reader, desk centrifuge, water bath, transferpettor, micro glass cuvette/96 well flat-bottom plate, 30 mesh sieve (or smaller), methylbenzene(express delivery not allowed), ice and distilled water.

Procedure:

I. Sample preparation

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 540 nm, set zero with distilled water.
2. Standard preparation: Dilute the 10 mg/mL glucose solution standard to 0.5, 0.4, 0.3, 0.2, 0.1 mg/mL with distilled water.
3. Add reagents as the following table.

Reagent	Test tube (T)	Contrast tube (C)	Standard tube (S)	Blank tube (B)
Dry soil sample (g)	0.03	0.03	-	-
Reagent I (μL)	5	5	-	-
The soil samples are all wetted by oscillating mixing, and let stand at 37°C for 15 minutes.				
Reagent II (μL)	75	75	-	-
Reagent III (μL)	220	-	-	-
Distilled water (μL)	-	220	-	-
Mix thoroughly. Incubate at 37 °C water bath for 24 hours. Centrifuge at 10000 g for 5 minutes at 4°C and take the supernatant. The supernatant is diluted 10 times and test (add 0.9 mL of distilled water into 0.1 mL of supernatant). Dilute it again if the OD >1.5.				
Supernatant (μL)	85	85	-	-
Standard (μL)	-	-	85	-
Distilled water (μL)	-	-	-	85
Reagent IV (μL)	215	215	215	215

Mix thoroughly, put in boiling water for 5 minutes (cover tightly to prevent water loss). Cooling with flowing water, then mix thoroughly. Take 200 μL into micro glass cuvette or 96 well plate, Detect the absorbance at 540 nm and note as A_T , A_C , A_S , A_B . Calculate $\Delta A_T = A_T - A_C$, $\Delta A_S = A_S - A_B$. Each test tube should be provided with one contrast tube.

III. S-SC activity calculation:

1. Standard curve established: According to the concentration of the standard tube (x) and absorbance ΔA_S (y), establish standard curve. According to the standard curve, take the ΔA_T ($A_T - A_C$, y) to the equation to acquire the sample concentration x(mg/mL).
2. Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the production of 1 milligram of reduce sugar in the reaction system per day every gram soil sample.

$$\text{S-SC (U/g soil sample)} = x \times 10 \times V_{rv} \div W \div T = 100 \times x$$

10: Dilution multiple;

T: Reaction time, 1 day;

V_{rv} : Total reaction volume, 0.3 mL;

W: Sample weight, 0.03 g;

Recent Product Citations:

[1] Hou Q, Wang W, Yang Y, et al. Rhizosphere microbial diversity and community dynamics during potato cultivation[J]. European Journal of Soil Biology, 2020, 98: 103176.

References:

[1] Gao M, Song W, Zhou Q, et al. Interactive effect of oxytetracycline and lead on soil enzymatic activity and microbial biomass[J]. Environmental toxicology and pharmacology, 2013, 36(2): 667-674.

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