

Soil Catalase (S-CAT) Activity Assay Kit

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

Operation Equipment: Microplate reader/ Spectrophotometer

Catalog Number: NA0620

Size:100T/48S

Components:

Reagent I: Liquid 0.3 mL×1.Storage at 4°C. The liquid is placed in the EP tube in the reagent bottle. Before use, take 0.05 mL of Reagent I and add 9.95 mL of distilled water to dilute for use or prepare in proportion. The reagent that can not be used up is stored at 4°C;

Reagent II: Powder×1. Storage at 4°C. Add 1 mL of distilled water before using to dissolve it. The left reagent should be stored at 4°C.

Reagent III: Liquid 3 mL×1. Storage at 4°C.

Product Description

Soil catalase(S-CAT) is an important enzyme of soil microbial metabolism, which plays an important role in the removal system of H₂O₂.

Since the absorbance at 240 nm is proportional to the amount of H₂O₂, the activity of S-CAT can be quantified by measuring the decrease in the absorbance of the reaction solution at 240 nm.

Reagents and Equipment Required but Not Provided.

Table centrifuge, water-bath, transferpettor, micro quartz cuvette/96 well UV flat-bottom plate, spectrophotometer / microplate reader 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 or microplate reader for 30 minutes, adjust the wavelength to 240 nm, set zero with distilled water.

2. Add reagents with the following list:

Reagent	Test Tube (T)	No Substrate Tube (NSu)	No Soil Tube (NSo)
Air-dried soil sample (g)	0.03	0.03	
Reagent I (μL)	260		260
Double distilled water (μL)		260	
shake and culture at 25°C for 20 minutes.			

Reagent II (μL)	10	10	10
Mix thoroughly, centrifuge at 8000 ×g for 5 minutes at room temperature and take all the supernatant.			
Reagent III (μL)	30	30	30

Mix thoroughly, detect the absorbance of each tube at 240 nm and noted as A_T , A_{NSU} , and A_{NSO} .

Note: Each test tube should be provided with a no substrate tube, and the no soil tube only need test once or twice.

III. Calculation

A. micro cuvette

Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the degradation of 1 mmol of H_2O_2 in the reaction system per day at 25 °C every gram of dry soil sample.

$$S-CAT(U/g) = [(A_{NSO} - A_T + A_{NSU}) \times V_{ra} \div (\epsilon \times d) \times 10^3] \div W \div T = 16.5 \times (A_{NSO} - A_T + A_{NSU})$$

V_{ra} : Total volume of the reaction system, 3×10^{-4} L;

ϵ : Molar extinction coefficient of hydrogen peroxide, 43.6 L / mol /cm;

D: Cuvette aperture, 1 cm;

T: Reaction time, 20 minutes = 1/72 day;

W: Sample mass, 0.03 g.

B. 96 well UV plate

Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the degradation of 1 mmol of H_2O_2 in the reaction system per day at 25 °C every gram of dry soil sample.

$$S-CAT(U/g) = [(A_{NSO} - A_T + A_{NSU}) \times V_{ra} \div (\epsilon \times d) \times 10^3] \div W \div T = 27.5 \times (A_{NSO} - A_T + A_{NSU})$$

V_{ra} : Total volume of the reaction system, 3×10^{-4} L;

ϵ : Molar extinction coefficient of hydrogen peroxide, 43.6 L / mol /cm;

d: Cuvette aperture, 0.6 cm;

T: Reaction time, 20 minutes = 1/72 day;

W: Sample mass, 0.03 g.

Note:

If the absorbed supernatant is still partly turbid, centrifuge it again after adding Reagent III.

Recent Product citations:

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] 杨兰芳, 曾巧, 李海波, et al. 紫外分光光度法测定土壤过氧化氢酶活性[J]. 土壤通报, 2011, 42(1):207-210.

[2] Johansson L H, Borg L A H. A spectrophotometric method for determination of catalase activity in small tissue samples[J]. Analytical biochemistry, 1988, 174(1): 331-336.

Related Products:

NA0846/NA0604 Soil Alkaline Phosphatase (S-AKP/ALP) Activity Assay Kit

NA0862/NA0619 Soil polyphenol oxidase (S-PPO) Activity Assay Kit

NA0861/NA0618 Soil Urease (S-UE) Activity Assay Kit

NA0860/NA0617 Soil Acid Phosphatase (S-ACP) Activity Assay Kit