Soil Catalase(S-CAT) Activity Assay Kit

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

Operation Equipment: Spectrophotometer

Catalog Number: NA0863

Size:50T/24S

Components:

Reagent I: Liquid 0.5 mL×1. Storage at 4℃. Before use, take 0.05 mL of Reagent I and add 9.95 mL of distilled water to dilute it for use or prepare it in proportion. The left reagent stored at 4℃.

Reagent II: Powder ×1. Storage at 4℃. Add 2 mL of distilled water before using to dissolve it. The left reagent should be stored at 4℃.

Reagent III: Liquid 6 mL×1. Storage at 4℃.

Product Description:

Soil catalase (S-CAT) is an important enzyme of soil microbial metabolism, which plays an important role in the removal system of H_2O_2.

Since the absorbance at 240 nm is proportional to the amount of H_2O_2, 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, transferpettor, spectrophotometer, water bath, 1 mL quartz cuvette, ice and distilled water.

Procedure:

I. Sample processing:

Fresh soil samples are naturally air-dried or oven to dry at 37℃, then sieved by 30 ~ 50 mesh sieve.

II. Determination procedure:

1. Preheat spectrophotometer for 30 minutes, adjust wavelength to 240 nm and 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)	0.1	0.1	-
Reagent I (μL)	1000	-	1000
Distilled water (μL)	-	1000	-
Shake and culture at 25℃ for 20 minutes.			
Reagent II (μL)	25	25	25

Mix thoroughly, centrifuge at 8000 ×g for 5 minutes at room temperature and take all the supernatant.			
Reagent III (μL)	120	120	120

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

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℃ every gram of dry soil sample.

S-CAT (U/g) = $[(A_{NSo} - A_T + A_{NSu}) \times Vra \div (\varepsilon \times d) \times 10^3] \div W \div T = 18.9 \times (A_{NSo} - A_T + A_{NSu})$

Vra: Total volume of the reaction system, 1.145×10^{-3} 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, 0.1 g.

Note:

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

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] 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