

## Soil Catalase(S-CAT) Activity Assay Kit

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

**Operation Equipment:** Spectrophotometer

**Catalog Number:** AK0596

**Size:**50T/24S

### Components:

**Reagent I:** Liquid 0.5 mL×1. Storage at 4°C . 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°C .

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

**Reagent III:** Liquid 6 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 H<sub>2</sub>O<sub>2</sub> .

Since the absorbance at 240 nm is proportional to the amount of H<sub>2</sub>O<sub>2</sub>, 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°C, 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°C 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
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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°C every gram of dry soil sample.

$$S-CAT (U/g) = [(A_{NSO} - A_T + A_{NSU}) \times V_{ra} \div (\epsilon \times d) \times 10^3] \div W \div T = 18.9 \times (A_{NSO} - A_T + A_{NSU})$$

$V_{ra}$ : Total volume of the reaction system, 1. 145×10<sup>-3</sup> L;

$\epsilon$ : 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:

AK0566/AK0565 Soil Alkaline Phosphatase (S-AKP/ALP) Activity Assay Kit

AK0594/AK0593 Soil Polyphenol Oxidase (S-PPO) Activity Assay Kit

AK0592/AK0591 Soil Urease (S-UE) Activity Assay Kit

AK0590/AK0589 Soil Acid Phosphatase (S-ACP) Activity Assay Kit