

Soil Dehydrogenase(S-DHA) Activity Assay Kit

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

Operation Equipment: Spectrophotometer/Microplate reader

Cat No: NA0594

Size: 100T/48S

Components:

Reagent I: Powder×1. Add 5 mL of distilled water before use, store at 4°C and protect from light. (Try to dilute it when it will be used)

Reagent II: Liquid 15 mL×1, store at 4°C.

Reagent III: Acetone, self-provided.

Product Description:

The activity of soil dehydrogenase can reflect the amount of active microorganisms in the soil system and its degradation activity to organic compounds, it can be used as the degradation index of soil microorganisms.

The hydrogen receptor 2, 3, 5-triphenyl tetrazolium chloride (TTC) is reduced to Triphenyl Formazone (TF) during cellular respiration, TF is red which has a maximum absorption peak at the wavelength of 485 nm. Detecting the absorbance at 485 nm can obtain the activity of soil dehydrogenase.

Required reagents and equipment:

Sieve, scale, constant temperature incubator/water bath, centrifuge, funnel, filter paper, Spectrophotometer/Microplate reader, micro glass cuvette/96 well flat-bottom plate, ice, distilled water, acetone(self-provided).

Procedure:

I. Sample preparation

1. Soil sample: Take 0.05 g of fresh soil sample after 40 meshes sieve.
2. Mud sample: Wash mud with distilled water, centrifuge at 12000 rpm for 10 minutes at 25°C, discard supernatant, repeat 3- 4 times.

II. Determination operation

1. Preheat Spectrophotometer/microplate reader for 30 minutes, adjust the wavelength to 485 nm, set the counter to zero with contrast tube.
2. Add the following reagents:

Reagent	Control tube (C)	Test tube (T)
Sample (g)	0.05	0.05
Reagent I (mL)	-	0.1
Reagent II (mL)	0.2	0.1

Mix thoroughly in centrifuge tube, incubate at 37°C dark place for 12 hours, then keep on ice for 5 minutes immediately.		
Reagent III (mL)	0.1	0.1
Shake several times, incubate at 37°C for 10 minutes, centrifuge at 12000 rpm 4°C for 5 minutes, take 200 µL of supernatant in micro glass cuvette or 96 well flat-bottom plate, preheat 30 minutes, set zero with distilled water, detect control tube and test tube, calculate ΔA .		

III. Calculation:

A. Micro glass cuvette

Definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the increasing absorbance of every 0.01 for per hour in per milliliter reaction system at 37°C every gram of sample.

$$sDHA (U/g) = (U/g \text{ h}) = \Delta A \div 0.01 \div T(12 \text{ h}) \div W(0.05 \text{ g}) \times V_{rv} (0.3 \text{ mL}) = 50 \times \Delta A$$

B. 96 well flat-bottom plate

Definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the increasing absorbance of every 0.005 for per hour in per milliliter reaction system at 37°C every gram of sample.

$$sDHA (U/g) = (U/g \text{ h}) = \Delta A \div 0.005 \div T(12 \text{ h}) \div W(0.05 \text{ g}) \times V_{rv} (0.3 \text{ mL}) = 100 \times \Delta A$$

T: Incubation time, 12 hours

W: Sample weight, 0.05 gram;

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

Note:

1. The prepared Reagent I store at 4°C in dark place, use timely within one weekend. If appear red, it cannot be used.
2. Reagent III is volatile and toxic, please wear lab clothes, masks and latex gloves for your health.
3. Ice bath immediately after completing the reaction to stop the reaction.
4. If the absorbance is larger, detect again after decreasing the sample. If the absorbance value is too small, the culture time should be prolonged.

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] Kumar S, Chaudhuri S, Maiti S K. Soil dehydrogenase enzyme activity in natural and mine soil-a review[J]. Middle-East Journal of Scientific Research, 2013, 13(7): 898-906.

[2] Friedel J K, Mölter K, Fischer W R. Comparison and improvement of methods for determining soil dehydrogenase activity by using triphenyltetrazolium chloride and idonitrotetrazolium chloride[J]. Biology and fertility of soils, 1994, 18(4): 291-296.

Related Products:

NA0805/NA0563 Soil Acid Protease Activity Assay Kit

NA0804/NA0374 Soil Alkaline Protease Activity Assay Kit

NA0846/NA0604 Soil Alkaline Phosphatase(S-AKP/ALP) Activity Assay Kit
NA0862/NA0619 Soil Polyphenoloxidase Activity Assay Kit
NA0373/NA0372 Soil Neutral Invertase(S-NI) Activity Assay Kit
NA0361/NA0360 Soil β -1,4-Glucanase Activity Assay Kit
NA0364/NA0363 Soil β -Xylosidase(S- β -XYS) Activity Assay Kit