

Sucrose Phosphoric Acid Synthetase (SPS) Activity Assay Kit

Detection instrument: Spectrophotometer/microplate reader

Catalog Number: AK0533

Size: 100T/48S

Components:

Extract Solution: 50 mL ×1. Storage at 4°C .

Reagent I: 2.5 mL×1. Storage at -20°C .

Reagent II: powder 10 mg×1. Storage at 4°C . Add 1 mL of distilled water to form 10 mg/mL sucrose solution. Dilute to 500 µg/mL with distilled water when the solution will be used.

Reagent III: 2 mL ×1. Storage at 4°C .

Reagent IV: 25 mL×1. Storage at 4°C .

Reagent V: 10 mL×1. Storage at 4°C .

Product Description

Sucrose is not only an important photosynthetic product, but also a major transport material in plants. Moreover, it is one of the storage forms of carbohydrates. Sucrose phosphate synthase (SPS) takes fructose-6-phosphate as the receptor, the sucrose produced by the reaction forms sucrose phosphate under the action of sucrose phosphatase. Sucrose phosphate synthase-sucrose phosphatase system is generally regarded as the main route of sucrose synthesis.

Sucrose phosphate synthase catalyzes fructose-6-phosphate to form sucrose phosphoric acid. The reaction between sucrose and resorcinol can present color change, which has a characteristic absorption peak at 480 nm and the enzyme activity is proportional to the depth of color.

Reagents and Equipment Required but Not Provided

Spectrophotometer/microplate reader, water-bath, centrifuge, adjustable pipette, micro glass cuvette/96 well plate, mortar/homogenizer and ice.

Procedure

I. Sample Extraction:

The tissue mass (g): Extract solution volume (mL) is 1:5- 10 (We recommend weigh about 0.1 g of tissue and add 1 mL of Extract solution). conduct ice bath homogenate. Centrifuge at 8000×g for 10 minutes at 4°C, take the supernatant and placed on the ice for test.

II. Determination procedure:

1. Preheat the spectrophotometer 30 minutes, adjust the wavelength to 480 nm and set zero with distilled water
2. Add reagents into 1.5 mL centrifuge tube with the following list:

Reagent Name (µL)	Test tube (T)	Control tube (C)	Standard tube (S)	Blank tube (B)
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Sample	10	10	-	-
Distilled water	-	45	45	45
Reagent I	45	-	-	-
Reagent II	-	-	10	-
Blending, water bath for 10 minutes at 25°C .				
Reagent III	15	15	15	15
Boil in boiling water bath for about 10 minutes (cover tightly to prevent water loss) and cool.				
Reagent IV	210	210	210	210
Reagent V	60	60	60	60

Mix thoroughly, react in water bath for 20 minutes at 80°C . After cooling, measure the absorption value of each tube at 480 nm.

Calculate $\Delta A_T = A_T - A_C$, $\Delta A_S = A_S - A_B$.

III. Calculation of SPS Activity Unit

1. Calculate by the concentration of protein

Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the production of 1 μg of sucrose per minute every milligram of tissue protein.

SPS activity($\mu\text{g}/\text{min}/\text{mg prot}$)= $(C_S \times V_1 \times \Delta A_T \div \Delta A_S) \div (V_1 \times C_{pr}) \div T = 50 \times \Delta A_T \div \Delta A_S \div C_{pr}$

2. Calculate by the sample fresh weight

Unit definition: One unit of enzyme activity is defined as the amount of enzyme catalyzes the production of 1 μg of sucrose per minute every gram of tissue.

SPS activity ($\mu\text{g}/\text{min}/\text{g fresh weight}$)= $(C_S \times V_1 \times \Delta A_T \div \Delta A_S) \div (W \times V_1 \div V_2) \div T = 50 \times \Delta A_T \div \Delta A_S \div W$

C_S : Concentration of standard tube, 500 $\mu\text{g}/\text{mL}$;

V_1 : Add the sample volume into the reaction system, 0.01 mL;

V_2 : Add the extraction liquid volume, 1 mL;

C_{pr} : Concentration of sample protein, mg/mL;

W : Sample fresh weight, g;

T : Reaction time, 10 minutes.

Note:

Try to complete the determination within 30 minutes.

References:

[1] Schrader S, Sauter J J. Seasonal changes of sucrose-phosphate synthase and sucrose synthase activities in poplar wood (*Populus canadensis* Moench 'robusta') and their possible role in carbohydrate metabolism[J]. Journal of Plant Physiology, 2002, 159(8): 833-843.

Related Products:

AK0538/AK0537 Sucrose Synthetase(SS) Activity Assay Kit

AK0226/AK0224 Plant Sucrose Content Assay Kit

AK0287/AK0286 Acid Invertase(AI) Activity Assay Kit



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AK0285/AK0284	Neutral Invertase (NI) Activity Assay Kit
AK0084/AK0083	Sucrose Synthetase (SS, Cleavage Direction) Activity Assay Kit
AK0082/AK0081	Solid-Acid Invertase (B-AI) Activity Assay Kit