

Ascorbic Acid (AsA) Content Assay Kit

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

Operation Equipment: Spectrophotometer/microplate reader

Cat No: BC1235

Size: 100T/96S

Product Composition: Before use, please carefully check whether the volume of the reagent is consistent with the volume in the bottle. If you have any questions, please contact Solarbio staff in time.

Reagent name	Size	Preservation Condition
Reagent I	Liquid 100 mL×1	2-8°C
Reagent II	Liquid 20 mL×1	2-8°C
Reagent III	Liquid 10 μL×1	2-8°C
Standard	Powder×1	2-8°C

Solution Preparation:

1. Reagent III: The liquid is placed in the EP tube in the reagent bottle. Before use, according to the dosage and the volume ratio of Reagent III to Reagent II is 1:250, and the mixture is ready to use.
2. Standard: Add 5.679mL of distilled water before use, mix thoroughly. Add 0.96mL of distilled water to 0.04mL of Standard, mix thoroughly and to be prepared as 400μmol/L AsA.

Description:

AsA is also called Vitamin C. AsA is the substrate of coenzyme, free radical scavenger, electron copolymer/receptor, biosynthesis of oxalate and tartrate. As the most important antioxidant in plant cells, AsA has important function in protecting chloroplast from oxidizing. It is also one of the important indexes to measure the quality of crop products.

Ascorbate oxidase (AAO) catalyze AsA to form DHA. According to detect the oxidize rate of AsA, can calculate the content of AsA.

Technical Specifications

Minimum Detection Limit: 0.7539 μmol/L

Linear Range: 6.25-1400 μmol/L

Required but not provided:

Mortar, ice, low temperature centrifuge, ultraviolet spectrophotometer/microplate reader, micro quartz cuvette/96 well flat-bottom plate (UV plate), adjustable pipette and distilled water.

Protocol:

I. AsA extraction:

1. Tissue:

Accordance the ratio of tissue(g): Reagent I volume (mL)=1: 5~10, (add 1 mL of Reagent I to 0.1 g of tissue). Homogenate on ice. centrifuge at 8000 g and 4°C for 20 min. Supernatant is ready for test.

2. Bacteria or cells:

Accordance the ratio of cells amount (10^4): Reagent I volume (mL)=500~1000: 1, (add 1 mL of Reagent I to 5 million cells). Ultrasonic on ice bath to smash cells, (power 300W, ultrasonic 3s, interval 7s for 3 min). centrifuge at 8000 g and 4°C for 20 min. Supernatant is ready for test.

3. **Serum:** Directly detect.

II. Determination procedure.

1. Preheat ultraviolet spectrophotometer/microplate reader for 30 min, adjust wavelength to 265 nm, set zero with distilled water.

2. Preheat Reagent II at 25°C water bath for 30 min.

3. Standard tube: Add 20 μ L of standard, 160 μ L of Reagent II and 20 μ L of Reagent III to micro quartz cuvette or 96 well flat-bottom plate (UV), mix thoroughly, detect at 265 nm, record the accordance A1 for 30s and A2 for 150s. $\Delta A_S = A1 - A2$.

4. Test tube: Add 20 μ L of supernatant, 160 μ L of Reagent II and 20 μ L of Reagent III to micro quartz cuvette or 96 well plate (UV), mix thoroughly, detect at 265 nm, record the accordance A3 for 30s and A4 for 150s. $\Delta A_T = A3 - A4$.

Note: Standard tube just test once or twice.

III. Calculation.

1. Protein concentration:

$$AsA \text{ (nmol/mg prot)} = [C_S \times \Delta A_T \div \Delta A_S \times V_{SR}] \div (C_{pr} \times V_{SR}) = 400 \times \Delta A_T \div \Delta A_S \div C_{pr}$$

2. Sample weight

$$AsA \text{ (nmol/g)} = [C_S \times \Delta A_T \div \Delta A_{SA} \times V_{SR}] \div (W \times V_{SR} \div V_{ST}) = 400 \times \Delta A_T \div \Delta A_S \div W$$

3. Cells amount:

$$AsA \text{ (nmol}/10^4 \text{ cell)} = [C_S \times \Delta A_T \div \Delta A_S \times V_{SR}] \div (\text{cell amount} \times V_{SR} \div V_{RT}) \\ = 400 \times \Delta A_T \div \Delta A_S \div \text{cell amount}$$

4. Liquid volume:

$$AsA \text{ (nmol/mL)} = [C_S \times \Delta A_T \div \Delta A_S \times V_{SR}] \div V_{SR} = 400 \times \Delta A_T \div \Delta A_S$$

C_S : Standard solution concentration, 400 μ mol/L;

V_{ST} : Supernatant total volume, 1.0 mL=0.001 L;

V_{SR} : Supernatant volume in reaction solution, 0.02 mL;

C_{pr} : protein concentration, mg/mL;

W: Sample weight, g

Cell amount: A unit of measurement based on 10^4

Note:

1. If the initial absorbance value of the sample is greater than 1.4, it is recommended that the sample be diluted with Reagent I and determined.

2. Prepare Reagent III and Standard when the solution will be used. Store at 4°C, use up within 3 days.

Experimental instances:

1. Take 0.1g of hawthorn fruit, add 1mL of Reagent I, homogenate on ice. Centrifuge at 8000g for 20 minutes at 4 °C , take the supernatant, and test according to the measured steps. Calculate $\Delta A_T = A_3 - A_4 = 1.0228 - 0.6627 = 0.3601$, $\Delta A_S = A_1 - A_2 = 0.3660 - 0.0090 = 0.3570$, calculate the enzyme activity according to sample weight:

$$AsA(\text{nmol/g weight}) = 400 \times \Delta A_T \div \Delta A_S \div W = 4035 \text{ nmol/g weight.}$$

Recent Product citations

[1] Yawen Ji, Panpan Zhang, Yixiao Xing, et al. Effect of 1 α ,25-dihydroxyvitamin D3 on the osteogenic differentiation of human periodontal ligament stem cells and the underlying regulatory mechanism. International Journal of Molecular Medicine. October 2018;(IF2.928)

Related products:

BC1250/BC1255	L-galactose-1,4-lactone dehydrogenase (Gal LDH) Assay Kit
BC1260/BC1265	Ascorbic Acid Oxidase (AAO) Activity Assay Kit
BC0220/BC0225	Ascorbate Peroxidase (APX) Activity Assay Kit