TECHNICAL MANUAL

Maltose Colorimetric Assay Kit

- **SKU CODE:** MAES0516
- **SIZE:** 96 Tests
- **DETECTION PRINCIPLE:** Assay Kit
- **RUO:** Research-Use-Only

Revised: 01/2026

1. Assay summary

- Reagent preparation
- Standard curve preparation
- Sample preparation
- Enzymatic reaction
- Chromogenic reaction
- Calculate results

2. Intended use

This kit can be used to measure maltose content in plant tissue samples.

3. Detection principle

Maltose is a disaccharide formed by two molecules of glucose linked by an α-1,4 glycosidic bond, also known as maltodisaccharide. Maltose is not only involved in glucose metabolism in the body, but is also widely used in the food and pharmaceutical industries, serving as an important indicator for product quality control.

Maltose is decomposed by enzymes to produce two molecules of glucose. Glucose reacts with the chromogenic agent to form a chromogenic substance, which shows color changes. There is a characteristic absorption peak at 505 nm, and the depth of the color is directly proportional to the maltose content.

4. Kit components & storage

Item	Component	Size (96T)	Storage
Reagent 1	Extraction Solution	60 mL x 1 vial	2-8 °C, 12 months
Reagent 2	Enzyme Reagent	Powder x 2 vials	2-8 °C, 12 months, shading light
Reagent 3	Chromogenic Agent A	10 mL x 1 vial	2-8 °C, 12 months, shading light
Reagent 4	Chromogenic Agent B	10 mL x 1 vial	2-8 °C, 12 months, shading light
Reagent 5	Standard	Powder x 2 vials	2-8 °C, 12 months

Item	Component	Size (96T)	Storage
	Microplate	96 wells	No requirement
	Plate Sealer	2 pieces	

5. Materials prepared by users

Instruments:

Microplate reader (500-510 nm, optimum wavelength: 505 nm), Homogenizer, Incubator, Water bath

6. Reagent preparation

1. Equilibrate all reagents to 25 °C before use.
2. **Preparation of enzyme working solution:** Dissolve one vial of enzyme reagent with 3 mL of extraction solution, mix well to dissolve. Store at 2-8 °C for 7 days protected from light.
3. **Preparation of 2 mg/mL standard solution:** Dissolve one vial of standard with 5 mL of extraction solution, mix well to dissolve. Store at 2-8 °C for 7 days.
4. **Preparation of standard curve:** Always prepare a fresh set of standards. Discard working standard dilutions after use. Dilute 2 mg/mL standard solution with extraction solution to serial concentrations. The recommended dilution gradient is as follows: 0, 0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1 mg/mL.

7. Sample preparation

1. **Plant tissue sample preparation:** 1) Harvest the amount of tissue needed for each assay (initial recommendation 50 mg). 2) Homogenize 50 mg tissue in 450 µL extraction solution with a dounce homogenizer at 4 °C. 3) Incubate at 95 °C for 5 min. Cool to 25 °C with running water. 4) Centrifuge at 10,000 x g for 10 min at 4 °C to remove insoluble material. Collect supernatant and keep it on ice for detection.
2. **Sample dilution:** The recommended dilution factors for different samples are as follows (for reference only): 10% Potato tissue homogenate: 2-5 fold; 10% Chinese cabbage leaf tissue homogenate: 2-5 fold; 10% Sweet potato tissue homogenate: 2-5 fold; 10% Corn seed tissue homogenate: 2-5 fold. The diluent is extraction solution. For dilution of other sample types, please perform a pretest to confirm the dilution factor.

8. Operating steps

Enzymatic reaction:

1. Standard tube: Add 100 μL of standard solution with different concentrations into 1.5 mL EP tube.

Control tube: Add 100 μL of sample into 1.5 mL EP tube.

Sample tube: Add 100 μL of sample into 1.5 mL EP tube.

2. Add 50 μL of extraction solution into control tubes. Add 50 μL of enzyme working solution into standard and sample tubes.

3. Mix fully and incubate at 55 °C for 60 min to obtain enzyme reaction solution. (Cover tightly to prevent moisture loss)

Chromogenic reaction:

1. Take 20 μL of enzyme reaction solution to the corresponding wells.

2. Add 90 μL of chromogenic agent A and 90 μL of chromogenic agent B to each well.

3. Mix fully with microplate reader and incubate at 37 °C for 30 min.

4. Measure the OD value of each well at 505 nm, as A. $\Delta A = A_{sample} - A_{control}$.

9. Calculation

The standard curve:

1. Average the duplicate readings for each standard.

2. Subtract the mean OD value of the blank (Standard #1) from all standard readings. This is the absolute OD value.

3. Plot the standard curve using the absolute OD value of standards and corresponding concentrations as y-axis and x-axis respectively. Create the standard curve (y = ax + b) with graph software (or Excel).

The sample:

Plant tissue sample:

maltose content (mg/g wet weight) = $(\Delta A - b) / a \times (V / m) \times f$

[Note]

$\Delta A = A_{sample} - A_{control}$

m: The wet weight of sample, g

V: The volume of extraction solution in the sample preparation step, mL

f: Dilution factor of sample before tested

10. Appendix I Performance Characteristics

Parameter:

Intra-assay Precision

Three potato tissue samples were assayed in replicates of 20 to determine precision within an assay (CV = Coefficient of Variation).

Intra-assay Precision

Parameters	Sample 1	Sample 2	Sample 3
Mean (mg/mL)	0.30	0.50	0.70
%CV	4.5	3.5	1.5

Inter-assay Precision

Three potato tissue samples were assayed 20 times in duplicate by three operators to determine precision between assays.

Inter-assay Precision

Parameters	Sample 1	Sample 2	Sample 3
Mean (mg/mL)	0.30	0.50	0.70
%CV	5.0	2.5	3.1

Recovery

Three samples of high, middle, and low concentrations were tested with each concentration assayed 6 times in parallel to obtain an average recovery rate of 101%.

Recovery

Parameters	Standard 1	Standard 2	Standard 3
Expected Conc. (mg/mL)	0.30	0.50	0.70
Observed Conc. (mg/mL)	0.28	0.52	0.74

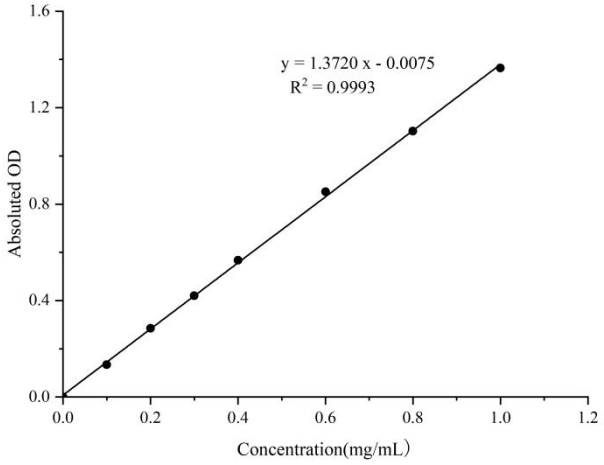
Parameters	Standard 1	Standard 2	Standard 3
Recovery rate (%)	93	104	105

Sensitivity

The analytical sensitivity of the assay is 0.01 mg/mL. This was determined by adding two standard deviations to the mean O.D. obtained when the zero standard was assayed 20 times, and calculating the corresponding concentration.

Standard curve

As the OD value of the standard curve may vary according to the conditions of the actual assay performance (e.g., operator, pipetting technique, or temperature effects), the standard curve and data are provided below for reference only:



Standard curve data

Concentration (mg/mL)	OD value 1	OD value 2	Average OD	Absolute OD
0	0.054	0.062	0.058	0
0.1	0.189	0.195	0.192	0.134
0.2	0.340	0.346	0.343	0.285
0.3	0.477	0.480	0.478	0.420
0.4	0.622	0.628	0.625	0.567

Concentration (mg/mL)	OD value 1	OD value 2	Average OD	Absolute OD
0.6	0.922	0.897	0.910	0.851
0.8	1.139	1.183	1.161	1.103
1	1.402	1.444	1.423	1.365

11. Appendix II Example Analysis

Example analysis:

Take 100 µL of 10% sweet potato tissue homogenate diluted 2-fold and carry out the assay according to the operation steps.

Standard curve: y = 1.3720x - 0.0075

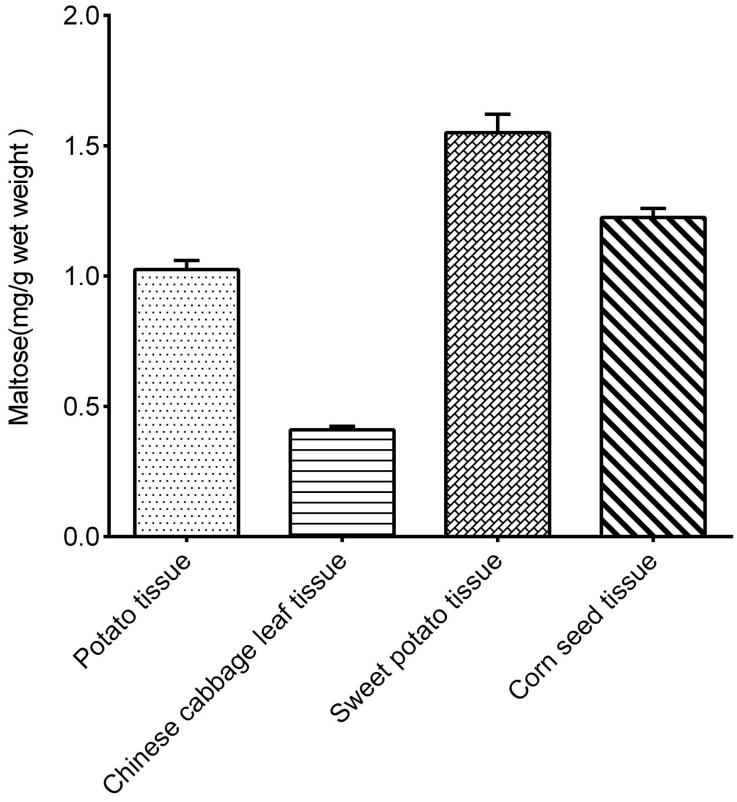
Average OD value of control well: 0.545

Average OD value of sample well: 0.656

Calculation result:

maltose content (mg/g wet weight) = (0.656 - 0.545 + 0.0075) ÷ 1.3720 × (0.9 ÷ 0.1) × 2 = 1.55 mg/g wet weight

Detect 10% potato tissue homogenate (diluted 2-fold), 10% Chinese cabbage leaf tissue homogenate (diluted 2-fold), 10% sweet potato tissue homogenate (diluted 2-fold), 10% corn seed tissue homogenate (diluted 2-fold) according to the protocol. The results are as follows:



12. Statement

1. This assay kit is for Research Use Only. Assay Genie assumes no responsibility for any problems or legal liabilities arising from the use of this kit for clinical diagnosis or any other purpose.

2. Please read the instructions carefully and calibrate the instruments before performing the experiments. Follow the instructions strictly throughout the procedure.

3. Appropriate protective measures must be taken, including wearing a lab coat and latex gloves.

4. If the concentration of the substance falls outside the detection range, perform an additional dilution or concentration step on the sample.

5. It is recommended to perform a pre-test if your sample type is not listed in the instruction manual.

6. Experimental results are closely related to reagent quality, operator technique, environmental conditions, and other factors. Assay Genie guarantees the quality of the kits only and is NOT responsible for sample consumption resulting from use

of the assay kits. It is advisable to estimate the expected sample usage and reserve sufficient samples before starting the experiment.

Assay Genie 100% money-back guarantee!

If you are not satisfied with the quality of our products and our technical team cannot resolve your problem, we will give you 100% of your money back.

Manufacturers Statement: This final kit system is assembled and quality-released by Assay Genie Limited.