

Ascorbic Acid (Vitamin C) Assay Kit (Colorimetric/Fluorometric)

LS-K243-100 (100 Tests) • Store at -20°C



Introduction

Ascorbic acid (the L-enantiomer commonly known as vitamin C) is an important antioxidant found in living organisms and applied as additives in food and other industrial processes. By reacting with reactive oxygen species, it protects the cell from oxidative damages. LSBio's method provides a simple, direct and high-throughput assay for measuring ascorbic acid. In this assay, ascorbic acid is oxidized by ascorbate oxidase resulting in the production of H₂O₂ which reacts with a specific dye to form a pink colored product. The color intensity at 570nm or fluorescence intensity (530/585 nm) is directly proportional to the ascorbic acid concentration in the sample.

Key Features

- Use 20 µL samples. Linear detection range: colorimetric assay 6 to 1000µM, fluorometric assay 1 to 100 µM ascorbic acid.

Applications

- Assays: ascorbic acid in biological samples such as serum, plasma, urine, saliva, milk, tissue, and cell culture.
- Drug Discovery/Pharmacology: effects of drugs on ascorbic acid metabolism.

Components

Component	K243-100
	100 Tests
Assay Buffer	10 mL
Enzyme Mix	120 µL
Dye Reagent	120 µL
Standard (10 mM Ascorbic acid)	400 µL

Materials Not Supplied

Pipetting devices, centrifuge tubes, clear flat-bottom uncoated 96-well plates, optical density plate reader; black flat-bottom uncoated 96-well plates, fluorescence plate reader.

Storage

The kit is shipped on ice. Store all kit components at -20 °C.

FOR RESEARCH USE ONLY! Not for use in humans.

LifeSpan BioSciences, Inc. • 2401 Fourth Avenue, Suite 900, Seattle, WA 98121
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Assay Procedure

Colorimetric Assay

Note: SH-containing reagents (e.g. b-mercaptoethanol, dithiothreitol, > 5 μM) are known to interfere in this assay and should be avoided in sample preparation.

Sample treatment: liquid samples such as serum and plasma can be assayed directly. Tissue and cell (106-107) lysates can be prepared by homogenization in cold 1 x PBS and centrifugation (5 min at 14,000 rpm). Use clear supernatants for assay. Milk samples should be cleared by mixing 600 μL milk with 100 μL 6 N HCl. Centrifuge 5 min at 14,000 rpm. Transfer 300 μL supernatant into a clean tube and neutralize with 50 μL 6 N NaOH. The neutralized supernatant is ready for assay (dilution factor $n = 1.36$).

1. Equilibrate all components to room temperature. Briefly centrifuge the tubes before opening. Keep thawed tubes on ice during assay.
2. Standards: mix 22 μL 10 mM Standard with 198 μL dH₂O (final 1000 μM). Dilute standard in dH₂O as follows.

No	1000 μM STD + H ₂ O	Vol (μL)	Ascorbic acid (μM)
1	100 μL + 0 μL	100	1000
2	60 μL + 40 μL	100	600
3	30 μL + 70 μL	100	300
4	0 μL + 100 μL	100	0

Transfer 20 μL diluted standards into separate wells of a clear flat-bottom 96-well plate.

Samples: transfer 20 μL of each sample into separate wells of the plate.

3. Color reaction. Prepare enough Working Reagent by mixing, for each reaction well, 85 μL Assay Buffer, 1 μL Enzyme Mix and 1 μL Dye Reagent. Add 80 μL Working Reagent to each well. Tap plate to mix. Incubate 10 min at room temperature.
4. Read optical density at 570nm (550-585nm).

Fluorometric Assay

The fluorometric assay procedure is similar to the Colorimetric Assay except that (1) 0, 30, 60 and 100 μM ascorbic acid standards and (2) a black 96-well plate are used. Read fluorescence intensity at $\lambda_{ex} = 530$ nm and $\lambda_{em} = 585$ nm.

Note: if the calculated Ascorbic acid concentration of a sample is higher than 1000 μM in the Colorimetric Assay or 100 μM in the Fluorometric Assay, dilute sample in water and repeat the assay. Multiply result by the dilution factor n .

Calculation:

Subtract blank value (#4) from the standard values and plot the DOD or DF against standard concentrations. Determine the slope and calculate the ascorbic acid concentration of Sample,

$$[\text{Ascorbic Acid}] = \frac{R_{\text{SAMPLE}} - R_{\text{BLANK}}}{\text{Slope } (\mu\text{M}^{-1})} \times n \quad (\mu\text{M})$$

R_{SAMPLE} and R_{BLANK} are optical density or fluorescence intensity readings of the Sample and H₂O Blank, respectively. n is the sample dilution factor.

Conversions: 1 mM ascorbic acid equals 17.6 mg/dL, 0.0176% or 176 ppm.

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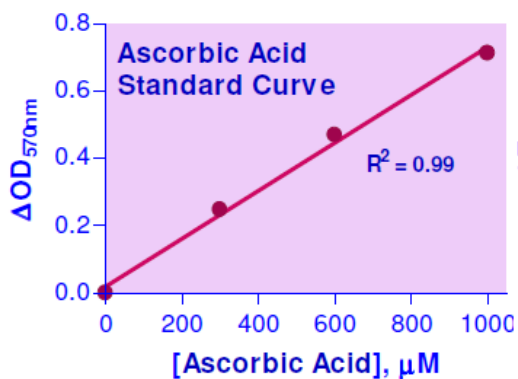
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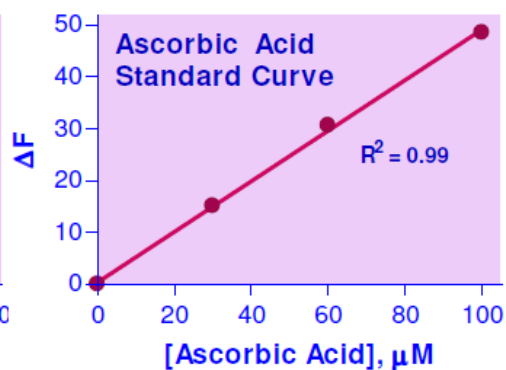
Sample Data

Serum samples were run in duplicate according to the standard procedure.

Ascorbic acid Standard Curves



96-well colorimetric assay



96-well fluorimetric assay

Version: V.08.09.2018

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