# COEI-1-ASCACI Ascorbic acid

# 2,3-didehydro-L-threohexano-4-lactone

# Acidum ascorbicum

# L-Ascorbic Acid

# C6H8O6 = 176.1

# SIN NO. 300

## 1. Objective, Origin and Scope of Application

Ascorbic acid is the enolic form of 3-oxo-L-gulofuranolactone (2,3-didehydro-L-threohexano-4-lactone).

This product falls into the category of antioxidants and is used as a reducing agent used to prevent oxidation.

Its use is subject to statutory regulations regarding limits.

## 2. Labelling

The concentration of this product should be indicated on the label, including cases in which it is used in mixtures, as should the safety and storage conditions.

## 3. Properties

Odorless white or very pale yellow crystalline powder with an acidic flavor. Aqueous solutions rapidly decay in air and light and have a maximum stability at pH 5.4. Melting point in a capillary tube: approximately 190 °C with decomposition.

Ascorbic acid in aqueous solution has a pH of less than or equal to 3.

## 4. Solubility

| | |
|---|---|
| Water at 20 °C | 290 g/l |

| | |
|---|---|
| Alcohol, 95% by vol. | 320 g/l |
| Methanol | 125 g/l |
| Acetone | soluble |
| Benzene, chloroform, ethyl ether, petroleum ether | insoluble |

**5. Rotatory Power**

In a 10 pp 100 (m/v) aqueous solution, ascorbic acid has a specific rotatory power

$[\alpha]_D^{20°C}$ is between +20,5° et +21,5°

**6. Absorption in Ultraviolet Light**

Ascorbic acid in alcohol solutions in a concentration of 10 mg/l exihibits an absorption spectrum with a maximum of approximately 244 nm.
The solution has a specific extinction of:

$E_{1\ cm}^{1\ pour\ cent}$ approximately 560

**7. Identifying Characteristics**

7.1. Preparation of the Solution for Testing

Dissolve 5 g ascorbic acid in water and fill to 100 ml using the same solvent.

7.2. Add 0.5 g monosodium carbonate to 2 ml of the solution prepared for testing (Par. 7.1).

7.3. Add several drops nitric acid diluted to 10 pp 100 (R) and several drops silver nitrate in a concentration of 1 pp 100 (R) to 1 ml of the solution prepared for tests (Par. 7.1). A gray precipitate will form.

7.4. To 1 ml of the solution prepared for testing (Par. 7.1) add one drop of recently prepared sodium nitrohexacyanoferrate (III) $Na_2[Fe(CN)_5NO]$, $2H_2O$ (sodium pentacyanonitrosylferrate) in a concentration of 5 pp 100 (m.v), and 2 ml of 10 pp 100 diluted sodium hydroxide solution (R). Then, add 0.6-0.7 ml of concentrated hydrochloric acid (R) and stir. The yellow color will turn to blue.

7.5. Add drop by drop 2 ml of 2,6-dichlorophenolindophenol solution (R) to the solution prepared for testing (Par. 7.1). It will instantly become decolored.

8. **Tests**

8.1. Sulfur Ash

As determined in 1.0 g ascorbic acid, the proportion of sulfur asheshould not be greater than 1 g/kg.

8.2. Appearance of the Solution

The solution prepared for tests under paragraph 7.1 should be clear and colorless.

8.3. Determining pH

The pH of the solution prepared for tests under paragraph 7.1 should be between 2.4 and 2.8.

8.4. Heavy metals

10 ml of the solution prepared for tests under paragraph 7.1 should meet the heavy metal limit requirements described in the annex. (The heavy metal concentration expressed in terms of lead should be less than 10 mg/kg).

8.5. Lead

Use the technique detailed in the Compendium to analyze the solution prepared for tests (Par. 7.1). (Lead concentration should be less than 2 mg/kg).

8.6. Mercury

Use the technique described in the annex to analyze the solution prepared for tests (Par. 7.1). (Mercury concentration should be less than 1 mg/kg.)

8.7. Arsenic

Using the method indicated in the Annex, test for arsenic in the test solution prepared in accordance with paragraph 7.1. (Arsenic concentration should be less than 3 mg/kg).

8.8. Iron

Implement the atomic absorption technique described in the Compendium to analyze the solution prepared for tests (Par. 7.1). (Iron concentration should be less than 5 mg/kg.)

8.9. Copper

Implement the atomic absorption technique described in the Compendium to analyze the solution prepared for tests (Par. 7.1). (Copper concentration should be less than 2 mg/kg.)

8.10. Moisture

Dehydration loss after drying in a desiccator under a vacuum and in the presence of sulfuric acid for 24 hours must be less than 0.4%.

8.11. Quantitative Analysis

In 80 ml of recently boiled and cooled water to which 10 ml of sulfuric acid diluted to 10 pp 100 (R) has been added, dissolve a test sample weighed precisely at about 0.20 g. Add 1 ml of starch (R) and titrate using 0.05 M iodine until a persistent blue coloration appears.

1 ml of 0.05 M iodine corresponds to 8.81 mg ascorbic acid.

The product should contain at least 99 pp 100 ascorbic acid.

## 9. Storage

Ascorbic acid should be stored in tightly sealed non-metal containers in a dark place. Aqueous solutions decay rapidly in air and light.

**Isoascorbic acid**

Isoascorbic acid, or D-ascorbic acid or erythorbic acid has the same antioxidant power as ascorbic acid and can be used for the same oenological purpose.

This acid exhibits the same appearance and the same solubility properties as ascorbic acid.

It is, optically, the reverse of ascorbic acid and has, under the same conditions, a specific rotatory power of:

$[\alpha]_D^{20°C}$ is between -20° et -21,5°

With the exception of rotatory power, this acid should exhibit the same properties as ascorbic acid, respond in the same way to the identifying reactions, pass the same tests and responds to the same quantitative analysis.

Note 1: The vitamin C efficacity of isoascorbic acid is approximately 1/20 of that of ascorbic acid.

Note 2: There is a preliminary draft resolution calling for registration of this product in the International Code of Oenological Practices.