OIV-MA-AS313-14A Sorbic acid

Type IV method

1. Principle of Method

Determination using ultraviolet absorption spectrophotometry

Sorbic acid (*trans, trans*, 2,4-hexadienoic acid) extracted by steam distillation is determined in wine distillate by ultraviolet absorption spectrophotometry. Substances that interfere with the measure of absorption in ultraviolet are removed by evaporation to dryness using a slightly alkaline calcium hydroxide solution. Samples with less than 20 mg/L are confirmed using thin layer chromatography (sensitivity: 1 mg/L).

2. Determination by ultraviolet absorption spectrophotometry

1. Apparatus
    1. Steam distillation apparatus (see chapter "Volatile Acidity")
    2. Water bath 100 °C
    3. Spectrophotometer allowing absorbance measurements to be made at a wavelength of 256 nm and having a quartz cell with a 1 cm optical path

2. Reagents
    1. Crystalline tartaric acid
    2. Calcium hydroxide solution, approx. 0.02 M
    3. Sorbic acid standard solution, 20 mg/L:

Dissolve 20 mg sorbic acid in approximately 2 mL 0.1 M sodium hydroxide solution. Pour into a 1 L volumetric flask, and make up to volume with water. Alternatively dissolve 26.8 mg of potassium sorbate, $C_6H_7KO_2$, in water and make up to 1 L with water.

2.3. *Procedure*

2.3.1. Distillation

Place 10 mL of wine in the bubbler of the steam distillation apparatus and add about 1 g tartaric acid. Collect 250 mL of distillate.

2.3.2. Preparation of the calibration curve

Prepare, by dilution of the standard solution (2.2.3) with water, four dilute standard solutions containing 0.5, 1.0, 2.5 and 5 mg of sorbic acid per liter. Measure their absorbance with the spectrophotometer at 256 nm using distilled

water as a blank. Plot a curve showing the variation of absorbance as a function of concentration. The relationship is linear.

2.3.3. Determination

Place 5 mL of the distillate in an evaporating dish of 55 mm diameter, add 1 mL of calcium hydroxide solution (2.2.2). Evaporate to dryness on a boiling water bath. Dissolve the residue in several mL of distilled water, transfer completely to a 20 mL volumetric flask and bring to volume with the rinsing water. Measure the absorbance at 256 nm using a solution obtained by diluting 1 mL of calcium hydroxide solution to 20 mL with water as the blank. Plot the value of the absorbance on the calibration curve and from this interpolate the concentration *C* of sorbic acid in the solution.

Note: In this method the loss due to evaporation is negligible and the absorbance is measured on the treated distillate diluted 1/4 with distilled water.

2.4. *Expression of results*

2.4.1. Calculation

The sorbic acid concentration in the wine expressed in mg/L is given by:

$$100 \times C$$

C = concentration of sorbic acid in the solution obtained in 2.3.3 expressed in mg/L.

Bibliography

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