OIV-MA-AS322-03B Sodium

Type III method

1. Principle

Sodium is determined directly in diluted wine (at least 1 mL:10 mL) by flame photometry.

2. Method

2.1. *Apparatus*

2.1.1. Flame photometer supplied with an air□butane mixture.

2.2. *Reagents*

2.2.1. Reference solution containing 20 mg sodium per liter

Absolute alcohol 10 mL

Citric acid monohydrate ($C_6H_8O_7\ H_2O$) 700 mg

Sucrose 300 mg

Glycerol 1000 mg

Potassium hydrogen tartrate 481.3 mg

Anhydrous calcium chloride, CaCl_2 10 mg

Anhydrous magnesium chloride, MgCl_2 10 mg

Dry sodium chloride, NaCl 50.84 mg

Water to 1000 mL

2.2.2. Dilution solution

Absolute alcohol 10 mL

Citric acid monohydrate ($C_6H_8O_7\ H_2O$) 700 mg

Sucrose 300 mg

Glycerol 1000 mg

Potassium hydrogen tartrate 481.3 mg

Anhydrous calcium chloride, CaCl_2 10 mg

Anhydrous magnesium chloride, MgCl_2 10 mg

Water to 1000 mL

To prepare 2.2.1 and 2.2.2, dissolve the potassium hydrogen tartrate in approximately 500 mL of very hot distilled water, mix with 400 mL of distilled water into which the other chemicals have already been dissolved, and make up to one liter.

Preserve the solutions in polyethylene bottles by adding two drops of allyl isothiocyanate to each.

2.3. *Procedure*

2.3.1. Calibration

Place 5, 10, 15, 20 and 25 mL of the reference solution in each of five 100 mL volumetric flasks and make up to 100 mL with the dilution solution to give solutions containing 1, 2, 3, 4 and 5 mg of sodium per liter respectively.

2.3.2. Determination

Carry out measurements at 589.0 nm and adjust the 100% transmission using distilled water. Successively aspirate the standard solutions directly into the photometer, followed by the wine diluted 1:10 with distilled water and note the percentage transmission of each. If necessary, the wine already diluted 1:10 may be further diluted with dilution solution.

2.4. *Expression of results*

2.4.1. Calculation method

Plot a graph of the percentage transmittance versus sodium concentration of the standard solutions. Record the transmission obtained for the diluted wine sample on this graph and note the concentration, C, of sodium in the wine.

The sodium concentration in mg of sodium per liter will be:

- F x C

where F is the dilution factor.

2.4.2. Repeatability *(r)*

- r = 1.4 mg/L (except for liqueur wine)
- r = 2.0 mg/L for liqueur wine.

3. Reproducibility *(R)*

- $R = 4.7 + 0.08\ xi$ mg/L.
- x_i = sodium concentration in the sample in mg/L.