# COMPENDIUM OF INTERNATIONAL METHODS OF ANALYSIS FOR SPIRITUOUS BEVERAGES AND ALCOHOLS

Determination of iron by atomic absorption (Type IV)

# **OIV-MA-BS-31 Iron- Determination by atomic absorption**

# Type IV method

## 1. Principle

Iron is determined by atomic absorption spectrophotometry by means of an oxidising air-acetylene flame, using an iron hollow-cathode lamp, at a wavelength of 248.3 nm on the alcoholised alcoholic beverage.

### 2. Apparatus

- 1. Glassware.
  - 1. 50 ml, 100 ml volumetric flasks (class A).
  - 2. 1, 2, 3, 4, 10, 50 ml volumetric pipettes (class A)
  - 3. 250 ml beaker (class A).
  - 2.2. Spectrophotometer (sample setting for Varian 575 model)
  - 2.2.1. Oxidising air-acetylene flame
    - Flow rates: air:: 7.5 1/min
    - C2 H2: 3.5 1/min
      - 2. Iron hollow-cathode lamp; Wavelength: 248.3 nm, slit: 0.5 nm, lamp intensity: 5 mA.

# 3. Reagents

- 1. Ultrapure demineralised water resistivity 18.2 M $\Omega$ .m (e.g. Milli-Q).
- 2. Stock solution to 1 g/l of iron: (e.g. Titrisol Merck).
- 3. Stock solution to 1 g/l of iron.

Place 10 ml of stock solution (3.2) in a 100 ml flask (2.1.1), fill to volume with demineralised water (3.1).

3.4. Calibration range: 2, 4, 6, 8 mg/1 of iron.

Place successively 1.0, 2.0, 3.0, 4.0 ml of the solution at 100 mg/1 of iron (3.30) in four 50 ml vials (2.1.1), fill to volume with demineralised water (3.1).

#### 4. Sample preparation

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## 1. Evaporation of alcohol.

Pipette (2.1.2) 50 ml of the alcoholic beverage in a 250 ml beaker (2.1.3). Evaporate the alcohol in a water bath to about one volume of 10 ml. Leave to cool, then pour the concentrate into a 50 ml vial (2.1.1), rinse the beaker and fill to volume with demineralised water (3.1).

Dilution in demineralised water (3.1) is only required if the concentration of iron is greater than 8 mg/l.

#### 5. Determinations

Successively present the calibration solutions (3.4), and samples (4.1.);

note the corresponding absorbances.

Establish the calibration curve absorbance = f (concentration in mg/1 calcium) by the least squares method.

Deduce the concentration of iron (mg/1) taking into account any dilution.

### 6. Bibliography

• Compendium of International Methods of wine and must analysis, 1990, O.I.V. ed.