# OIV-MA-F1-01 Conductivity

**Type IV method**

## 1. Principle

The electrical conductivity of a column of liquid defined by two parallel platinum electrodes at its ends is measured by incorporating it in one arm of a Wheatstone bridge.

The conductivity varies with temperature and it is therefore expressed at 20°C.

## 2. Reagents

Use only reagent grade chemicals

2.1. Purified water for laboratories, with specific conductivity below 2 µS $cm^{-1}$ at 20°C, for example EN ISO 3696 type II water.

2.2. Reference solution of potassium chloride.

Dissolve 0.581 g of potassium chloride, KCl previously dried to constant mass at a temperature of 105°C, in demineralised water (2.1). Make up to one litre with demineralised water (2.1). This solution has a conductivity of 1 000 µS $cm^{-1}$ at 20°C. It should not be kept for more than three months.

A commercial preparation can be used.

## 3. Apparatus

3.1. Conductivity meter enabling measurements of conductivity to be made over a range from 1 to 1 000 microsiemens per cm (µS $cm^{-1}$).

3.2. Water bath for bringing the temperature of samples to be analysed to approximately 20°C (20 ± 2°C).

## 4. Procedure

1. Preparation of the sample to be analysed

Use a solution with a total sugar concentration of 25 ± 0.5 % (m/m) (25° Brix): weigh a mass equal to 2500/P and make up to 100 g with water (2.1),

P = percentage (m/m) of total sugars in the rectified concentrated must.

4.2. Determination of conductivity

Bring the sample to be analysed to 20°C by immersion in a water bath. Maintain the

temperature to within ± 0.1°C.

Rinse the conductivity cell twice with the solution to be examined.

Measure the conductivity and express the result in µS $cm^{-1}$.

## 5. Expression of the Results

The result is expressed in microsiemens per cm (µS$cm^{-1}$) at 20°C to the nearest whole number for the 25% (m/m) (25° Brix) solution of rectified concentrated must.

5.1. Calculations

If the apparatus does not have temperature compensation, correct the measured conductivity using Table I. If the temperature is below 20°C, add the correction; if the temperature is above 20°C, subtract the correction.

## 6. Characteristics of the method

Repeatability (r)

- r = *3* µ*S/cm*

Reproducibility (R)

- R = *16* µ*S/cm*

**Table I**

Corrections to be made to the conductivity for temperatures different from 20°C (µS $cm^{-1}$)

| Conductivity | Temperature (°C) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 20.2<br>19.8 | 20.4<br>19.6 | 20.6<br>19.4 | 20.8<br>19.2 | 21.<br>19.0 | 21.2<br>18.8 | 21.4<br>18.6 | 21.6<br>18.4 | 21.8<br>18.2 | 22,0[1]<br>18.0[2] |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 50 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| 100 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 4 | 4 |
| 150 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | 6 | 7 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 200 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 250 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 |
| 300 | 1 | 3 | 4 | 5 | 7 | 8 | 9 | 11 | 12 | 13 |
| 350 | 1 | 3 | 5 | 6 | 8 | 9 | 11 | 12 | 14 | 15 |
| 400 | 2 | 3 | 5 | 7 | 9 | 11 | 12 | 14 | 16 | 18 |
| 450 | 2 | 3 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 500 | 2 | 4 | 7 | 9 | 11 | 13 | 15 | 18 | 20 | 22 |
| 550 | 2 | 5 | 7 | 10 | 12 | 14 | 17 | 19 | 22 | 24 |
| 600 | 3 | 5 | 8 | 11 | 13 | 16 | 18 | 21 | 24 | 26 |

[(1)]Subtract the correction.
[(2)]Add the correction.