Method OIV-MA-AS313-15 Type I method

pH

(A31, Oeno 438-2011)

1. Principle

The difference in potential between two electrodes immersed in the liquid under test is measured. One of these two electrodes has a potential that is a function of the pH of the liquid, while the other has a fixed and known potential and constitutes the reference electrode.

2. Apparatus

2.1 pH meter with a scale calibrated in pH units and enabling measurements to be made to at least ±0.01 pH units.

2.2 Electrodes:

- glass electrode, kept in distilled water;
- calomel-saturated potassium chloride reference electrode, kept in a saturated solution of potassium chloride; or,
- a combined electrode, kept in distilled water.

3. Reagents

– Buffer solutions:

- Saturated potassium hydrogen tartrate solution, containing 5.7 g/L potassium hydrogen tartrate ($CO_2HC_2H_4O_2CO_2K$) at 20°C. (This solution may be kept for up to two months by adding 0.1 g of thymol per 200 mL.)

$$\text{pH} \begin{cases} 3.57 \text{ at } 20\ ^{o}\text{C} \\ 3.56 \text{ at } 25\ ^{o}\text{C} \\ 3.55 \text{ at } 30\ ^{o}\text{C} \end{cases}$$

- Potassium hydrogen phthalate solution, 0.05 M, containing 10.211 g/L potassium hydrogen phthalate, $CO_2HC_6H_4CO_2K$, at 20°C. (This solution may be kept for up to two months.)

$$\text{pH} \begin{cases} 3.999 \text{ at } 15\ ^{o}\text{C} \\ 4.003 \text{ at } 20\ ^{o}\text{C} \\ 4.008 \text{ at } 25\ ^{o}\text{C} \\ 4.015 \text{ at } 30\ ^{o}\text{C} \end{cases}$$

Solution containing:
potassium *di*-hydrogen phosphate, KH_2PO_4 ...……..... 3.402 g
di-potassium hydrogen phosphate, K_2HPO_4 ...……..... 4.354 g
water to .....… …./....……. 1 litre
(This solution may be kept for up to two months)

pH { 6.90 at 15 °C
6.88 at 20 °C
6.86 at 25 °C
6.85 at 30 °C

Note: commercial reference buffer solutions traceable to the SI may be used.

For example: pH 1.679 ±0.01 at 25°C

pH 4.005 ±0.01 at 25°C

pH 7.000 ±0.01 at 25°C

4. Procedure

4.1 *Zeroing of the apparatus*

Zeroing is carried out before any measurement is made, according to the instructions provided with the apparatus used.

4.2 *Calibration of the pH meter*

The pH meter must be calibrated at 20°C using standard buffer solutions connected to the SI. The pH values selected must encompass the range of values that may be encountered in musts and wines. If the pH meter used is not compatible with calibration at sufficiently low values, a verification using a standard buffer solution linked to the SI and which has a pH value close to the values encountered in the musts and wines may be used.

4.3 *Determination*

Dip the electrode into the sample to be analyzed, the temperature of which should be between 20 and 25°C and as close as possible to 20°C. Read the pH value directly off the scale.

Carry out at least two determinations on the same sample.

The final result is taken to be the arithmetic mean of two determinations.

5. Expression of results

The pH of the must or the wine is reported to two decimal places.