COEI-1-OXYGEN Oxygen

$O_2 = 32.0$

N°SIN :948

N°CAS= 7727-44-7

1. Object, origin and field of application

Gas used for operations of hyperoxygenation of must or oxygenation of wine. It is also used pure or mixed with nitrogen (reconstituted air) during alcoholic fermentation (pumping).

2. Labelling

The label must mention the nature of the gas and refer to its composition and purity. The safety conditions should also be indicated on the package.

3. Characteristics

Colourless, odourless gas without flavour. Non flammable, it supports combustion.

The weight in grams of a litre of oxygen under normal conditions under the pressure of 760 mm of mercury and at 20°C is 1.429 g.

A volume of water dissolves 0.0325 volume of oxygen (44 mg/l). This solubility is 0.049 ml at 0°C (70 mg/l) and a volume of alcohol dissolves 0.1428 volume of oxygen.

It is therefore possible to dissolve 44 ml of oxygen at 20°C in a litre of wine with an alcoholic strength of 12% vol.

In association with nitrogen (air) the maximum solubility of oxygen is 10.27 ml/l in water at 20°C that is about 13.9 ml in a litre of wine whose alcoholic strength is 12% vol.

4. Test trials

The global purity of the oxygen used in oenology should be above or equal 99% in volume.

Before any measurement, it is advisable to allow the gas to escape for a few minutes in order to purge the piping.

4.1. Chromatographic dosage

Search and determination of gases: nitrogen, carbon monoxide (less than 10 µl/l), argon, carbon dioxide (less than 300 µl/l), etc. are quickly obtained by chromatography in gaseous phase.

4.2. Oxygen dosage

Place a sufficient quantity of ammonium hydroxide and ammonium chloride solution prepared by mixing equal volumes of water and ammonium hydroxide and by saturating with ammonium chloride at room temperature in an apparatus made up of:

- 100 ml burette calibrated with a bi-directional stopcock,
- pipette for gas absorption and
- level vase with an appropriate capacity and all the connections for linking the whole set.

Fill the pipette for gas absorption with copper turnings, wire or metallic lattice or any other appropriate system.

Eliminate all the gas bubbles from the liquid in the testing apparatus. Use the test trial solution two or three times without performing any measurements.

Fill the calibrated burette, all the connections, the two stopcock openings, and the liquid uptake tube.

Entrain 100.0 ml of oxygen in the burette while lowering the level vase.

Open the stopcock facing the absorption pipette and force the oxygen to penetrate in the absorption pipette by lifting the level vase. Shake the pipette in order to favour the close contact of the liquid, gas and copper.

Continue shaking until no other decrease in volume occurs.

Entrain the residual gas again in the calibrated burette and measure its volume:

A volume of gas more than 1.0 ml should not remain.

In solution, oxygen can be determined by polarography.

5. Packaging

Oxygen is supplied in highly resistant steel cylinders painted white, with needle valves. The resistance of these cylinders must be periodically checked.