II.3.5.5 Oxygenation

Classification:

- Oxygen : processing aid

Definition:

Addition of oxygen or air to wine

Objectives:

a) To use "micro-oxygenation", “macro-oxygenation” and "nano-oxygenation" technologies on wines;

b) to initiate oxidation phenomena with the aim of:

contributing to stabilisation of colour and maturation of red wines by encouraging in particular the production of acetaldehyde, which can react with flavanols and anthocyanins to cause the formation of new pigments that are more stable and more intensely coloured (hyperchromic and bathochromic effect) than native anthocyanins,

preparing wines used in treatments to eliminate excess iron (*file II.3.3.1 ‘Removal of iron’*) through oxidation of ferrous iron into ferric iron;

c) to reduce the concentration of "volatile sulphur compounds" such as hydrogen sulphide, methane-thiol, etc.;

d) to reduce aroma compounds related to vegetal sensory characters;

e) to facilitate fining of wines.

Prescriptions:

a) In the case of “micro-oxygenation”, the rate at which the quantity of oxygen is added should be lower than that of the oxygen consumption by the treated wine; in other words, oxygen should not be accumulated in the wines during treatment. It is preferable to use this technique when wines have a high concentration of free anthocyanins.

b) “Macro-oxygenation” is defined by the addition of higher doses of oxygen compared to “micro-oxygenation” and by a shorter addition period. This is specifically practiced at the end of fermentation, at a post-fermentative stage and up until the first racking off lees.

c) In the case of “nano-oxygenation”, oxygen is added at regular intervals in very small quantities, such as 10 to 100 µg oxygen per litre of wine.

d) In the case of treatment of excess iron (file 3.3.1), oxygenation should be followed by an addition of tannin in proportion to the iron concentration of the wine, followed by fining, preferably with casein. The addition of oxygen should

always precede the removal of iron by calcium phytate.

e) For stabilisation of the colour and improvement of the quality of a red wine during maturation, the doses to be added to the wine, in the case of "micro-oxygenation", are around 1-5 mg/L per month – depending, mainly, on their initial anythocyanin and polyphenol concentration and concentration of free SO_2. In the case of treatment using "macro-oxygenation", the oxygen doses added are higher to take into account the oxygen consumption by the yeast lees.

f) Due to the potential for the development of oxidative aromas, wine that undergoes oxygenation should be tasted regularly in order to define an optimum duration and temperature depending on the desired aromatic profile of the wine. Micro-oxygenation is not recommended above 22 °C to avoid excessive oxidation or below 8 °C to avoid oxygen accumulation.

g) The aim of oxygenation should not be a reduction in sulphite of wines containing excess sulphur dioxide.

h) Microbiological stability (especially where Brettanomyces bruxellensis is concerned) should be monitored to avoid organoleptic deviations in wines.

Recommendation of OIV:

Admitted