COEI-1-ZEOLIT Zeolite Y-Faujasite

1. Object, origin and field of application

Zeolite Y-Faujasite is synthesized from alumina sources such as sodium aluminate and silica sources such as sodium silicate.

Zeolite Y-Faujasite incorporated in depth filtration filter sheets play an important role in simultaneously clarifying and selectively removing taint molecules which alter wine flavours

2. Characteristics

Zeolite Y-Faujasite for selectively removing taint molecules, such as tricholoanisole, are characterized by having a silica-to-alumina ratio of 3 or higher. The negative charges of the framework are balanced by the positive charges of cations in non-framework positions.

3. Test trials

3.1. Loss on drying

Put 5g of Zeolite Y-Faujasite in a capsule. Heat in an oven to 120 ± 2°C. After two hours, the mass loss should be smaller than 5%.

3.2. Odour and taste

Put 2.5 g of Zeolite Y-Faujasite in 1 L of wine. Leave standing for 24h. Compare the taste (for example with the duo-trio test or refer to the sensorial analysis document of the OIV) of the test wine to wine not containing any zeolite.

The test can also be carried out using filter sheets with Zeolite Y-Faujasite preconditioned according to the manufacturer usage instructions. Compare the taste of the filtered wine to wine filtered through standard depth filtration sheets not containing any specific zeolite.

The Zeolite Y-Faujasite should not impart any foreign odour or taste to the wine.

3.3. pH

Mix 1g of specific Zeolite Y-Faujasite in 40 mL of deionized water and shake for 20 minutes. After 5 minutes of rest, the pH of the supernatant is between 5 and 7.

3.4. Metal contents

3.4.1. Test solution preparation

Slowly add tartaric acid to 1 litre of deionized water until a pH of 3 is reached. Into a 500 ml flask with a large neck which can be hermetically sealed, add 500 ml of the tartaric acid solution. Weigh 10g of dried specific Zeolite Y-Faujasiteand sprinkle the sample in the constantly stirred solution. After this addition, shake vigorously for 5 minutes. Allow to stand for 24 to 48 hours. Decant, centrifuge, or filter if necessary to obtain at least 200 ml of clear liquid.

3.4.2. Arsenic

In the test solution obtained following the procedure in 3.4.1, determine Arsenic using an atomic absorption spectrometer, according to the method described in chapter II of the *International Oenological Codex*. Arsenic content must be less than 0.3 mg/kg specific Zeolite Y-Faujasite.

3.4.3. Cadmium

In the test solution obtained following the procedure in 3.4.1, determine Cadmium using an atomic absorption spectrometer, according to the method described in chapter II of the *International Oenological Codex*. Cadmium content must be less than 0.3 mg/kg specific Zeolite Y-Faujasite.

3.4.4. Chromium

In the test solution obtained following the procedure in 3.4.1, determine Chromium using an atomic absorption spectrometer according to the method described in Chapter II of the *International Oenological Codex*. Chromium content must be less than 0.3 mg/kg specific Zeolite Y-Faujasite.

3.4.5. Copper

In the test solution obtained following the procedure in 3.4.1, determine Copper using an atomic absorption spectrometer, according to the method described in chapter II of the *International Oenological Codex.* Copper content must be less than 0.3 mg/kg specific Zeolite Y-Faujasite.

3.4.6. Iron

In the test solution obtained following the procedure in 3.4.1, determine Iron using an atomic absorption spectrometer, according to the method described in chapter II of the *International Oenological Codex.* Iron

content must be less than 3 mg/kg specific Zeolite Y-Faujasite.

3.4.7. Lead

In the test solution obtained following the procedure in 3.4.1, determine Lead using an atomic absorption spectrometer, according to the method described in chapter II of the *International Oenological Codex.* Lead content must be less than 0.3 mg/kg specific Zeolite Y-Faujasite.

3.4.8. Manganese

In the test solution obtained following the procedure in 3.4.1, determine Manganese using an atomic absorption spectrometer. Manganese content must be less than 0.3 mg/kg specific Zeolite Y-Faujasite.

3.4.9. Mercury

In the test solution obtained following the procedure in 3.4.1, determine Mercury using an atomic absorption spectrometer, according to the method described in chapter II of the *International Oenological Codex.* Mercury content must be less than 0.1 mg/kg specific Zeolite Y-Faujasite.

3.4.10. Selenium

In the test solution obtained following the procedure in 3.4.1, determine Selenium using an atomic absorption spectrometer. Selenium content must be less than 1 mg/kg specific Zeolite Y-Faujasite.

3.4.11. Silver

In the test solution obtained following the procedure in 3.4.1, determine Silver using an atomic absorption spectrometer, according to the method described in chapter II of the *International Oenological Codex*. Silver content must be less than 0.3 mg/kg specific Zeolite Y-Faujasite.

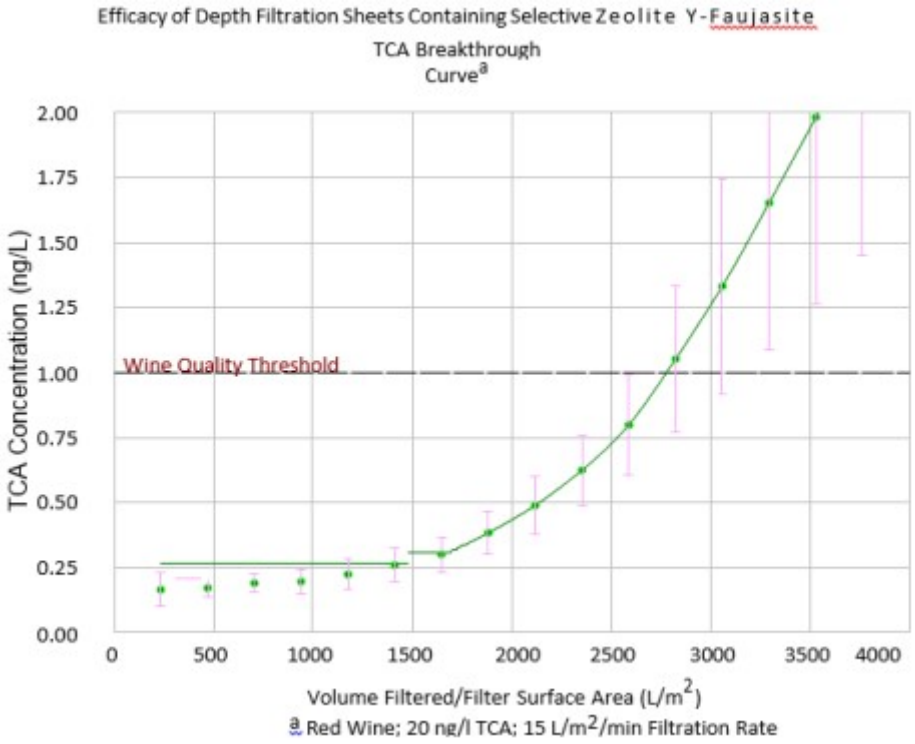
3.4.12. Zinc

In the test solution obtained following the procedure in 3.4.1, determine Zinc using an atomic absorption spectrometer, according to the method described in chapter II of the *International Oenological Codex*. Zinc content must be less than 0.3 mg/kg specific Zeolite Y-Faujasite.

4. Identification

4.1. Efficacy testing

Efficacy testing of depth filtration pads containing Zeolite Y-Faujasite for the selective removal of 2,4,6 trichloroanisole (TCA) involves treating wine contaminated with 20 ng/L of 2,4,6 trichloroanisole (TCA). The pad is set in an appropriate filtration device and preconditioned by rinsing with clean water. After preconditioning, the contaminated wine is pushed through the filter pad at a rate of 15 litres, per meter squared of filtration area, per minute. Samples of the filtered wine are taken every $\approx$ 235 litres per meters squared of filtration area. Each filtered wine sample is analysed using the GCMS. The TCA concentration data from each sampling event is then integrated to create a filter pad breakthrough curve.



The breakthrough curve shown was generated using a number of commercial pads produced on various production dates.

5. Storage conditions

Selective filter sheets incorporating Zeolite Y-Faujasiteshould must be stored in their original packaging in an odourless, dry and ventilated environment

Appendix 1

- Patent reference: WO 2007/061602 A1
- *Highly selective molecular confinement for the prevention and removal of taint in foods and beverages* John Cunningham.