Colloidal characteristics

Cellulose gum is a colloid with a negative surface charge, as metatartric acid. Its dissolution into the wine takes place quickly, in less than 8 hours at 18°C. AEB suggests to utilize New-Cel 24-48 hours before bottling or before any filtration stage, once this period has passed we can be sure that the product is perfectly integrated with the wine. As metatartric acid, even New-Cel may react with the proteins present in the wine, therefore it is suggested to verify that white and rosé wines are stable as far as proteins are concerned.

<table>
<thead>
<tr>
<th>New-Cel addition with</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gelatin</td>
<td>Clear solutions compatible.</td>
</tr>
<tr>
<td>Casein</td>
<td>This protein immediately builds flocks at the wine pH value. The addition of New-Cel into the clarified wine does NOT cause any clouding.</td>
</tr>
<tr>
<td>Lysozyme</td>
<td>Immediately cloud solution: unstable.</td>
</tr>
<tr>
<td>Albumin</td>
<td>Sample stabilized with bentonite: clear solution.</td>
</tr>
</tbody>
</table>

Compatibility TEST in a solution similar to wine

Stabilizer of tartaric precipitations

Colloidal characteristics

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In-depth study about New-Cel

Effective, easy and quick to be used

The EC Regulation 606/2009 enables the utilization of cellulose gum (carboxymethylcellulose) for the tartaric stabilization of wines. This preparation has been used in the food sector for many years, where it is preferred to many other additives because of its total biodegradability, production ecology and healthiness. The utilization of carboxymethylcellulose is widely spread, it is used for: baker’s products, fruit juices, low-calorie drinks, liquors, for the preparation of soups, creams and ice-creams.

The carboxymethylcellulose is in the form of an odourless white powder, that must be previously dissolved in water: the direct addition to the wine would cause the formation of filamentary floccles that would require a following vigorous stirring.

To enable the easy and effective utilization of the carboxymethylcellulose, AEB Group set up a proper solubilisation protocol that, through low-speed mixers and the sterilization of the process water, enabled to obtain New-Cel a watery solution, transparent, sterile, chemically stable and with a high viscosity degree.

New-Cel viscosity

The cellulose gums available on the market are differentiated by the molecular dimensions and the intensity of the electronegative charge. These two parameters are strictly related with the effectiveness of the carboxymethylcellulose in preventing the increase of the tartaric crystals. New-Cel has a high surface charge giving a strong power in blocking the potassium ions of the tartar crystal, avoiding the precipitation without altering any other chemical parameter of the wine.

The composition characteristics, which make New-Cel so effective, originate also from its high viscosity: 200 cps at 25°C; 350 cps at 5°C.

New-Cel effectiveness

The utilization of New-Cel grants the tartaric stabilization during time, as it does not degrade nor alter with the heat, unlike metatartaric acid.

The suitable dosage of New-Cel may be determined with the mini-contact test or with the test of cold storage at -5°C of the sample for time, as it does not degrade nor alter with the heat, unlike metatartaric acid.

New-Cel in red wines

Normal cellulose gums facilitate the precipitation of unstable colouring compounds, so if the bottled wine is stored at a low temperature, there is an important decrease of the colouring intensity. New-Cel has been suitably studied even to prevent the colour precipitation. In the case of a particularly accentuated instability of the colouring matter, it is suggested the utilization of New-Cel 24 hours before the refrigeration of the sample and the contemporaneous addition of Arabino, Arabic gum with a high stabilizing power.

In order to verify the effectiveness of New-Cel in red wines, an experimental protocol has been defined as follows: the addition of New-Cel to the wine at the dose of 350 g/hL, the warm storage for one week and a following refrigeration at 5°C for another week.

The samples treated with AEB cellulose gum have been compared with some untreated samples and with other samples where a cellulose gum with a lower substitution degree has been used.

Trials to determine the tartaric instability

In order to determine if a wine is stable from the tartaric point of view, four different methods can be used: cold storage test, freezing test, mini-contact test, analysis of the saturation temperature.

Cold storage test: it is used above all in the research field but, because of its duration, it is scarcely used in the practice. This test consists in putting a wine sample, with or without stabilizers, into an isobathic bath containing distilled water cooled down at 6°C with an external circuit. The possible formation of crystals and the conductivity variation, determined in microSiemens, are observed after 5-6 days.

The tartaric precipitations take place almost always during the first 2 days of storage at 6°C and, if a proper equipment is used, the obtained results are very reliable.

For the determination of the tartaric instability, it is based on the evaluation of the wine conductibility at 5°C before and after the addition of cream of tartar, inducing the immediate formation of tartrate crystals in unstable samples. The formed crystals remove potassium ions and tartaric acid from wines and cause therefore a conductivity decrease.

This quick and reliable test is the most widespread in the routine analysis: a white wine is considered stable from the tartaric point of view when the variation in microSiemens (ΔµS) is lower than 30; for a red wine, considering the presence of colloids, a difference of 40 microSiemens is accepted.

Determination of the saturation temperature: it is based on the continuous measurement of the wine conductivity when the wine is cooled down from 25°C to 5°C. If we compare the results of the wine as it is with those of the wine added with crystalization agents, we observe that the values are substantially the same, if the temperature reaches a critical point: here the crystals begin to precipitate and the conductivity of the wine with cream of tartar becomes lower than the untreated wine. The temperature limit where values begin to differentiate is called “saturation temperature”. This trial, rather used in the past, is now in disuse and the mini-contact test is preferred.

New-Cel in red wines

The wine is a Barbaresco 2009, unstable from the tartaric point of view with a pH 3,57, NTU 6,3.

The wine is at the limit of the tartaric stability and has a stable colour that in fact takes advantage of the light oxygenation occurring during the handling of the samples: the cold TQ has a higher absorbance than TQ. The sample with New-Cel is stable both from the tartaric point of view and for the colouring matter.

As a conclusion, if the colouring matter is unstable, the utilization of New-Cel prevents the tartaric precipitation. If on the contrary the colouring matter is unstable, it is necessary a short cold passage of the wine, in order to remove the excessive colour which may cause a clouding in the bottle.