SAMPLE Wein Saft from AUSTRIA

Weingut Urbanihof Familie Paschinger

INTRODUZIONE

In literature there is still no specific protocol analysis of tartaric stability of grape juice The increase in requests for such beverages, non-alcoholic, is leading the research methodologies and chemical principles that can give credible theories of stability state of such beverages, and make them applicable to the principles of analysis undertaken by the producers themselves or by laboratories enological analysis. With the ability to know the state of saturation of a salt solution on the KHT, use the tools on line CheckStab® (Delta Acque, Firenze), as for wine, the degree of stability of grape juice can be analyzed follows the course of electrochemical conductivity, and use it to create a model of stability classification

The electrochemistry conductivity derived from dissolved ions in solution, and wine as in grape juice, the ions arising from KHT are very abundant. This explains why the conductivity is used as a characteristic to be used to analyze the degree of saturation of this salt, and therefore know the degree of stability of the solution. Knowing the degree of stability enables us to know whether and under what conditions of the solution, salt crystals are formed and foresee if there is the presence of the precipitate.

Obviously the presence of precipitate in a beverage commercial degrades the quality of the drink itself, so the need to ensure the stability of the real product is a significant goal for producers.

In grape juice we find more salt dissolved KHT than wine. This difference is due to alcohol present in wine and it is absent in grape juice . The state of oversaturation in the juice is much more thrust than the wine. The thermodynamic properties are different between wine and grape juice, as can be seen in the table. The fall of conductivity during an analysis minicontatto in juices is much stronger than wine. Wines unstable in general show a drop in conductivity rarely exceed 100 µS, differently, in the grape juices often occur falls more than 300 µS. A stability analysis performed with CheckStab gives us the value of loss of conductivity after adding in the test sample with a quantity of KHT, at a temperature of 0 ° C, 1 gram for white and to 2 grams for red. Usually the wine and the juice are in a state of oversaturation, but without crystallization and then no formation of precipitate. The colloidal matrix block the formation of the crystal. The addition of excess salt leads to a collapse of the matrix, and the oversaturation is lost. The decrease of the conductivity value is proportional to initial state of oversaturation.

The stability of the solution is due to the degree of saturation. The higher the oversaturation greater the possibility that the collapse of the matrix occurs leading to the formation of crystals and precipitate. Thermodynamically, the temperature affects mostly on the grade of saturation of a salt in any solvent. We can calculate how much the temperature increases the solubility of a salt,or through CheckStab, the

saturation temperature (Tsat) for a solution to a salt that is the temperature where the amount of salt that continually melts and salt precipitates is equal..

At this temperature we are in a dynamic equilibrium concentrations, which may be affected only by varying the temperature or the concentrations of the species into equilibrium.

ESPERIENZA LABORATORIO

The grape juice samples analyzed are from Austria, taken at the **Weingut Urbanihof Familie Paschinger, Fels am Wagram Österreich.**

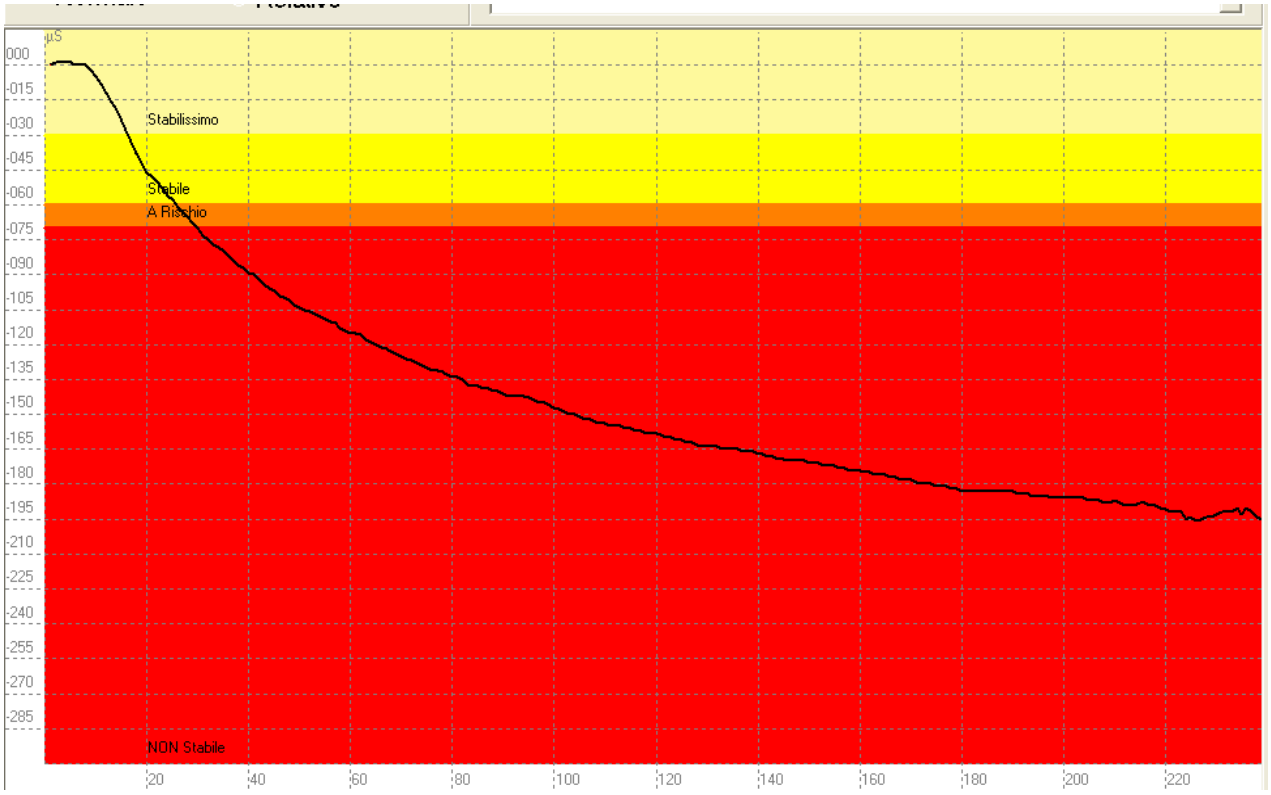
The samples were analyzed by αLIFE2008 Check Stab.

Most of the samples stabilized by the winery, both white and red, showed a fall of conductivity higher than 50 uS during a mini contact analysis µS.

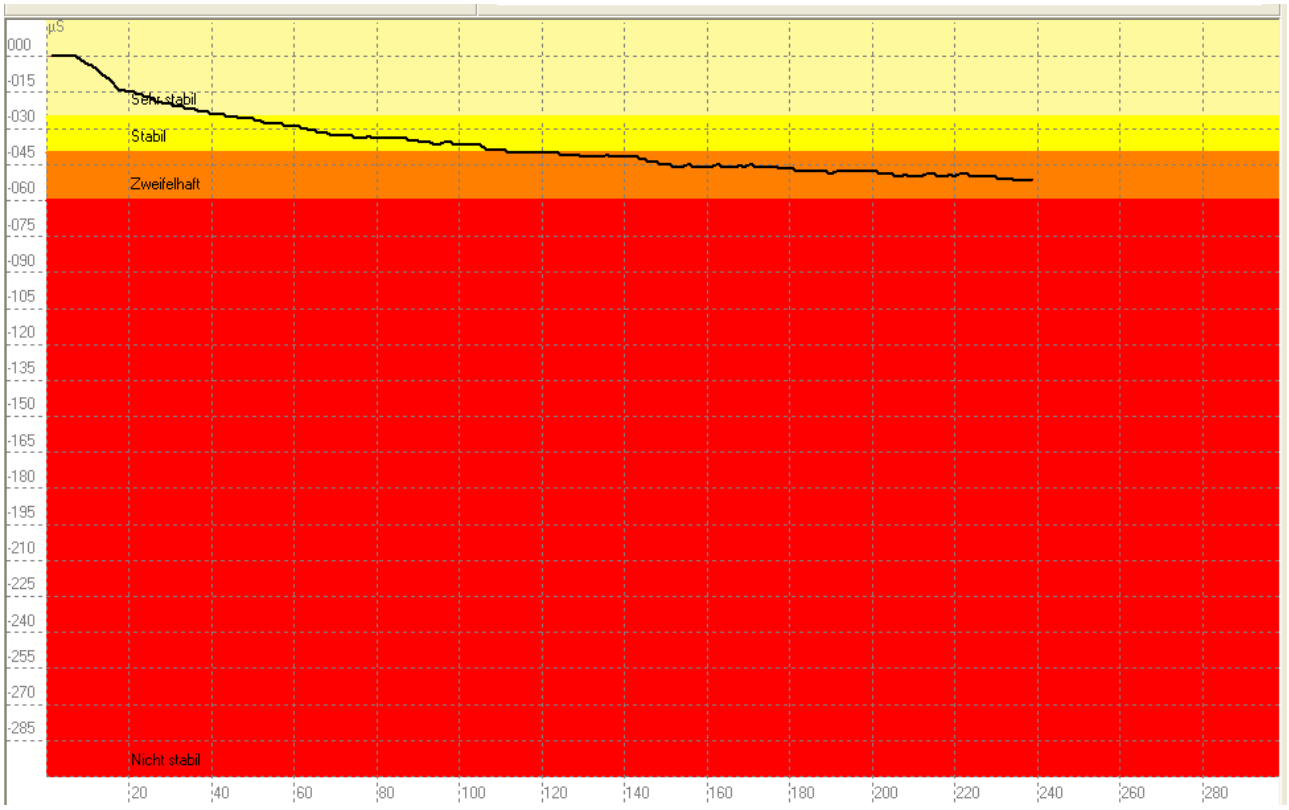
The stabilization at the winery of origin was made not so accurate, but only by storage at room temperature for 4 days. Given the Austrian environmental conditions, we consider average temperatures ranging from approximately 0 ° and 2 ° C.

Engineers of Urbanihof cellar, carrying out the stability tests with a CheckStab Fashion, found values of fall of the conducivity very high.

SAMPLE RS 258 Stabilized 197 µS start 2217 µS to 2020 µS

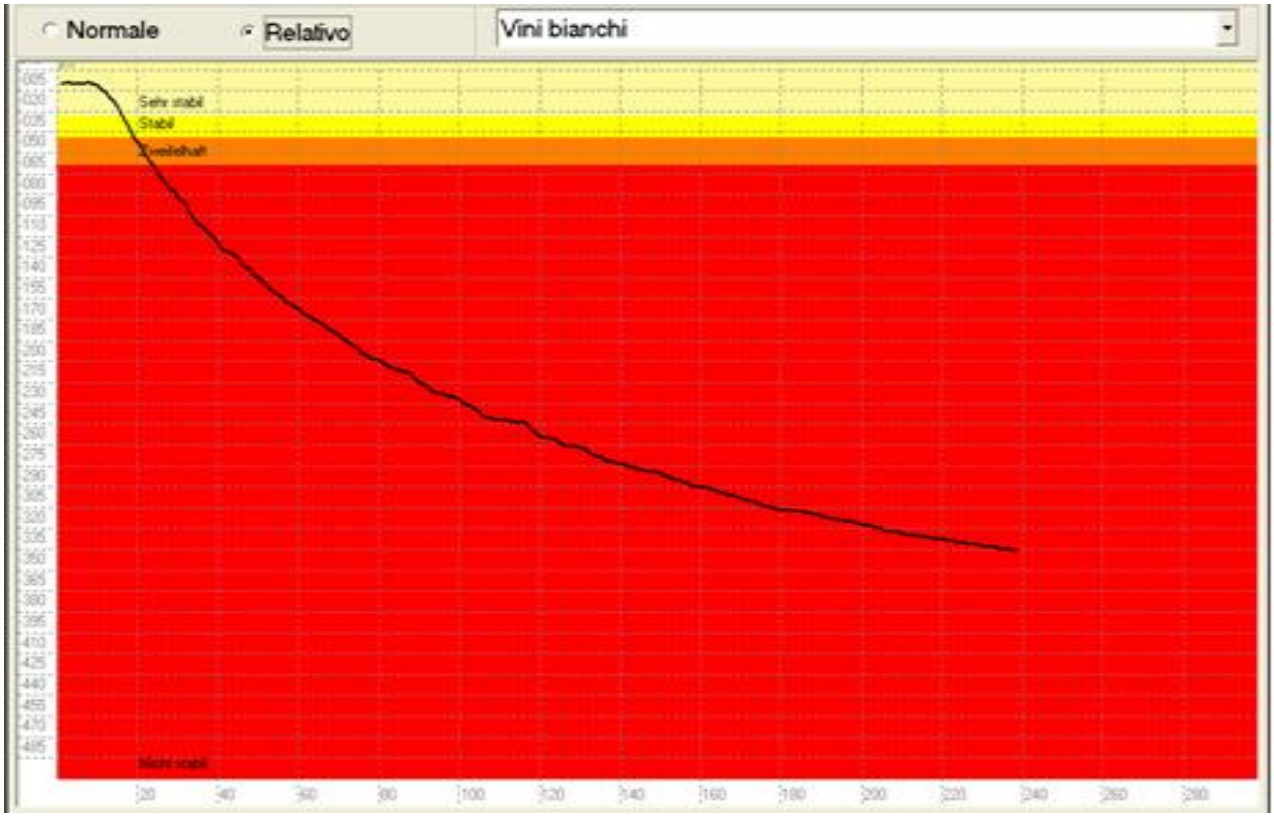


SAMPLE **WS 169 Stabilized** **Fall 52 µS** **start 1901 µS** **to 1849 µS**

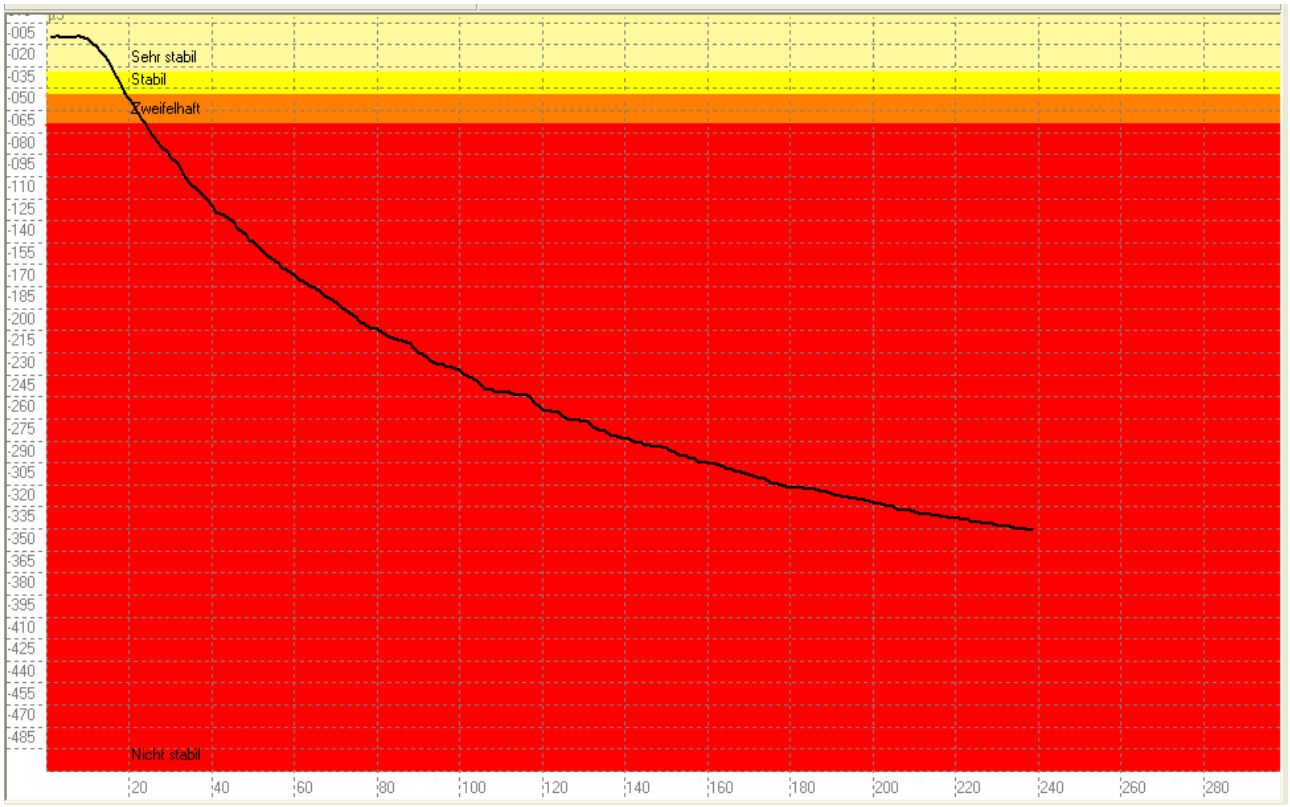


The sample RS 258 is a red grape juice and WS 169 is white. Before being taken out at low temperatures, minicontatto performed on samples yielded the following results:

SAMPLE WS169 NON Stabilized Fall 337 µS start 2308 µS to 1971 µS



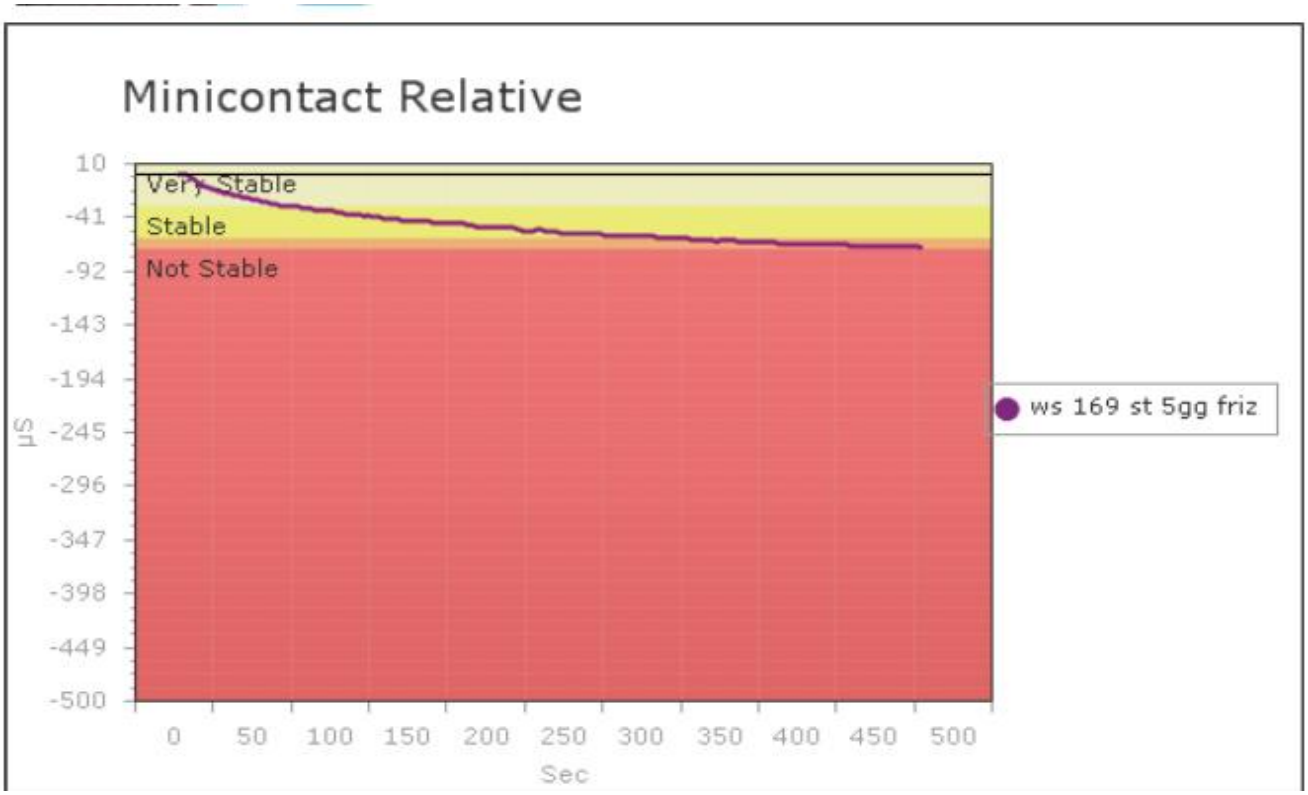
SAMPLE RS258 NN Stabilized Fall 337 µS start 2308 to 1971



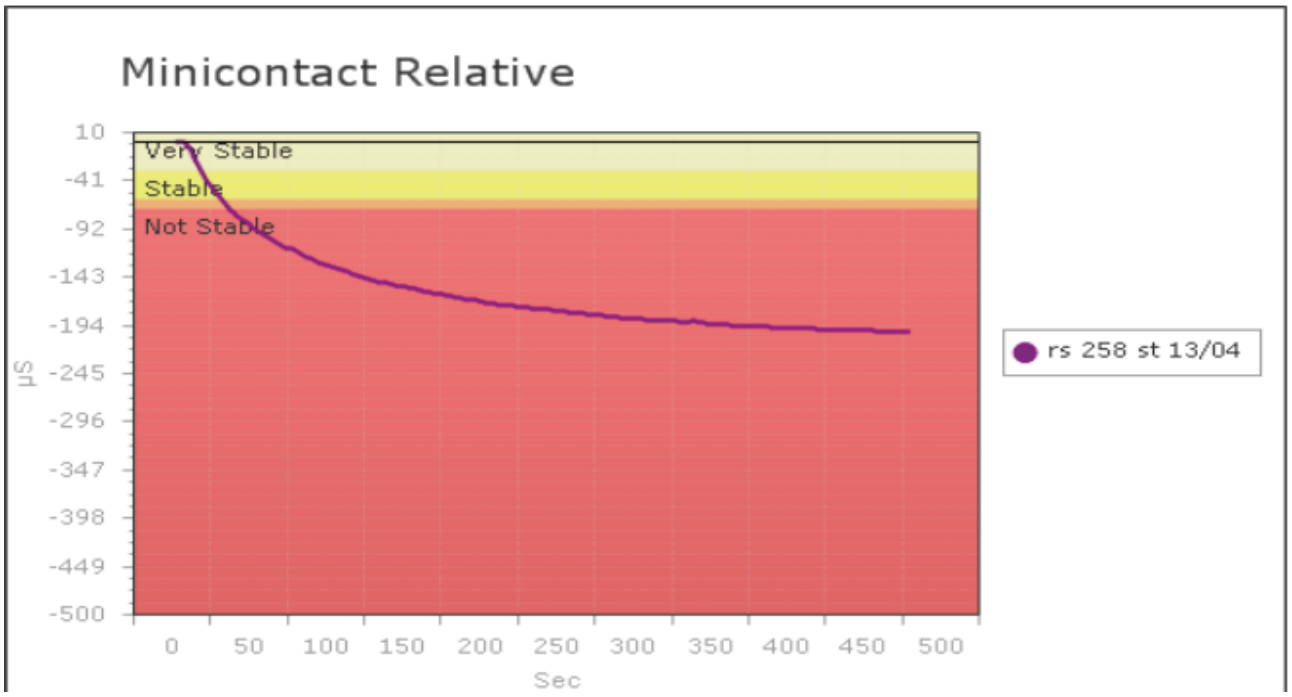
We note from results that the solution is in a large state of oversaturation, and the slopes of the curves show also a drop in conductivity after 240 seconds of duration analysis. A visual analysis of the samples after storage doesn't show a large precipitation of salt yet, as would be expected considering the result of Minicontatto.

The same samples, WS169 and RS258, kept at a temperature of -4 ° C in our laboratory for five and six days, respectively, show a rather abundant precipitation early after two days.

SAMPLE WS169 5 Days -4°C Fall 70,00 µS start 1956,00 µS to 1886,00 µS



SAMPLE RS258 (6 Days -4°C) Fall 200µS start 2271,00µS to 2071,00µS



In this case, the formation of the precipitate at -4 ° C is abundant, as was considered reliable the results found by analysis of the fall of conductivity by CheckStab.

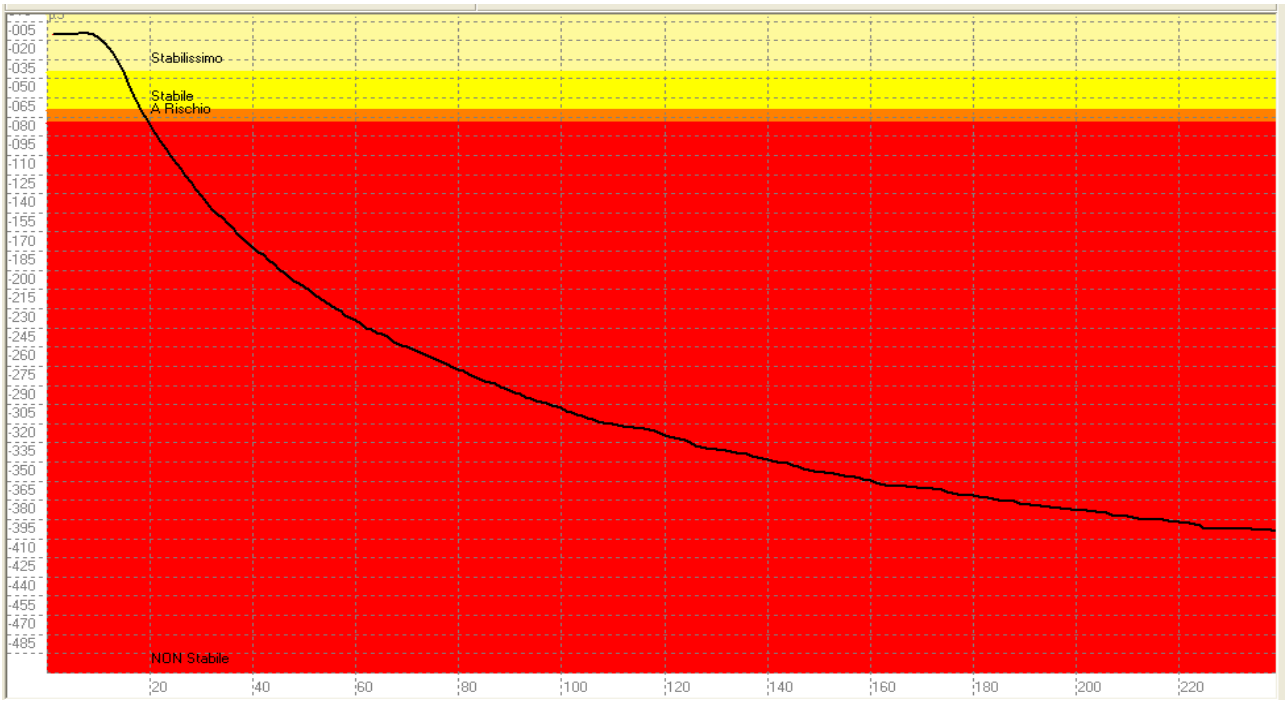
This confirms the fact that average temperatures above 0 ° C does not lead to the collapse of the matrix solution, and the precipitation is still hampered. Temperatures below 0 ° C (between -2 ° and -4 ° C) lead the collapse of the matrix rather quickly, with formation precipitate, it is then losing the state of supersaturated.

Other samples analyzed by minicontatto during cold storage at -4°C show a rather abundant precipitation early after two days.

SAMPLE	Caduta µS Iniziale	Dopo cold storage -4°C	n. giorni
W 169 nns	335	70	5
6 w 9	280	16	6
Rs 229 st	335	132	6
9 R 9	273		6
R 88 nn	302	41	6
Rs 179 st	348		6
Rs 258 st	274	200	6

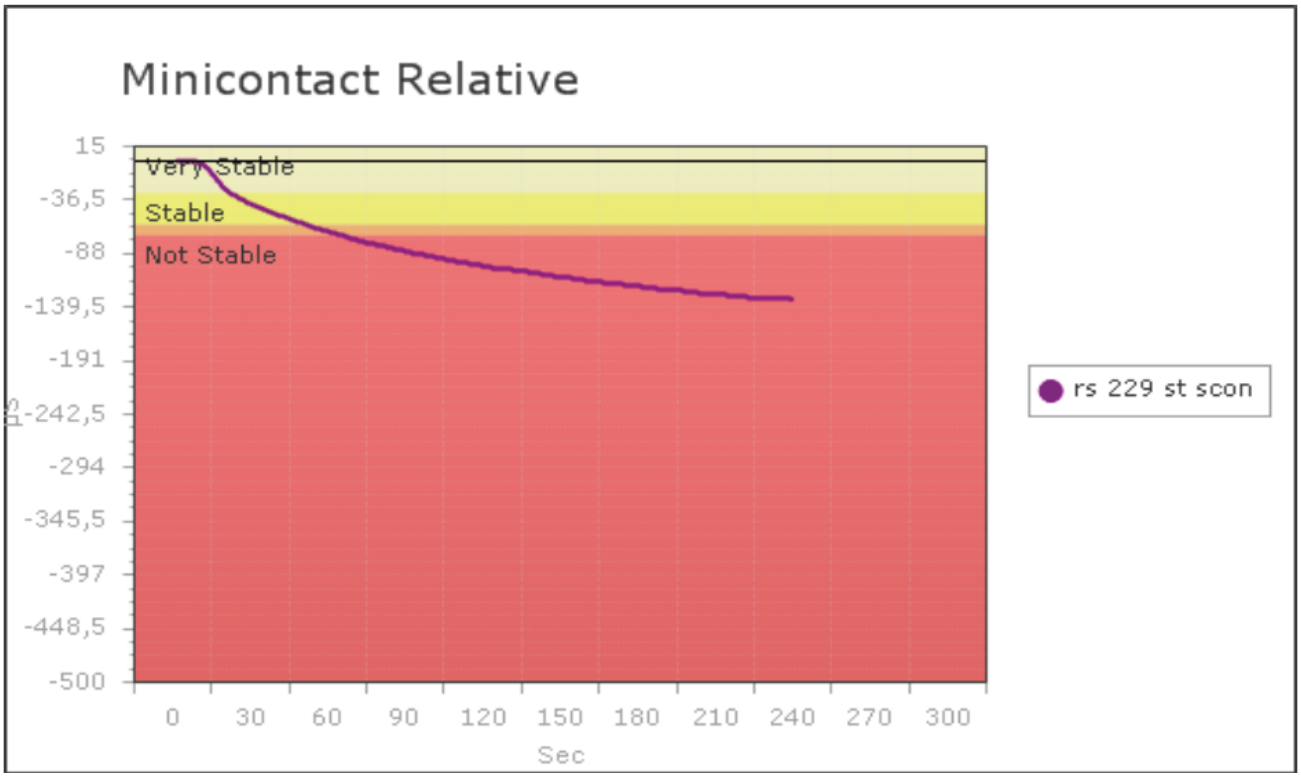
The sample RS 229 stabilized at the winery Urbanihof, have a fall of 389 µS,

SAMPLE RS229 NON Stabilised Fall 389 µS start 2412 µS to 2023 µS



The same sample, kept in the refrigerator for 6 days at -4 ° C in our laboratories, formed a precipitated relatively abundant.

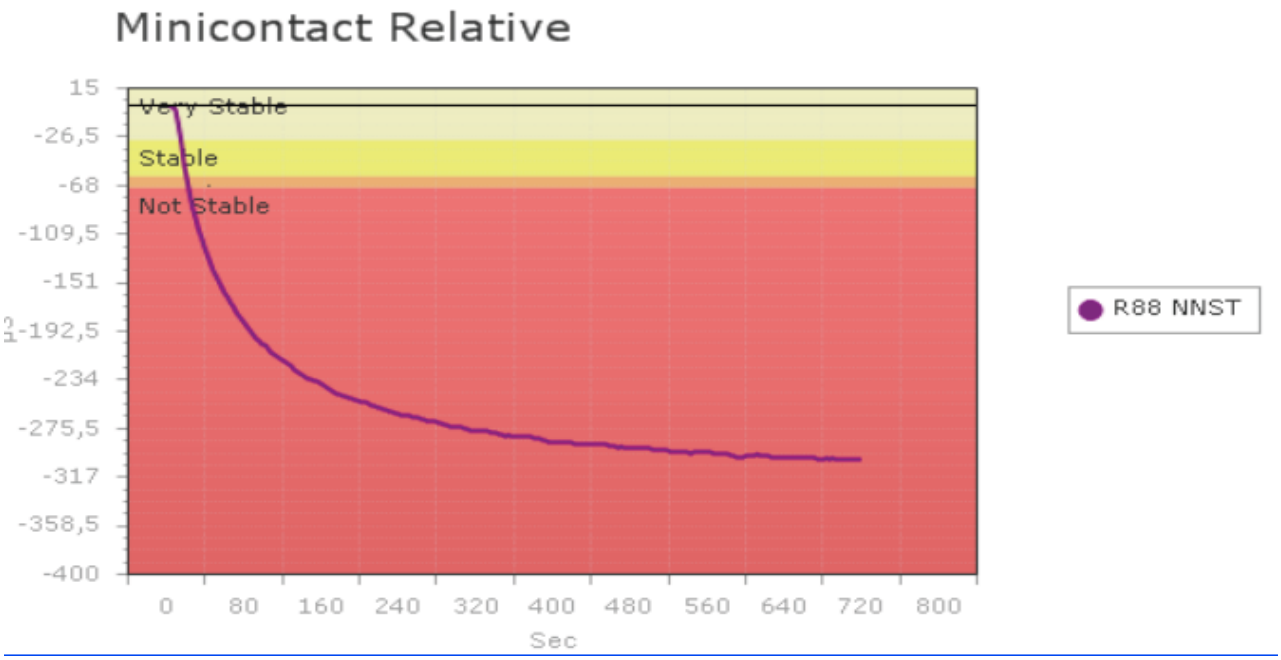
SAMPLE RS229 (6 Days -4°C) Fall 132,90 µS start 2166,70µS to 2033,80µS



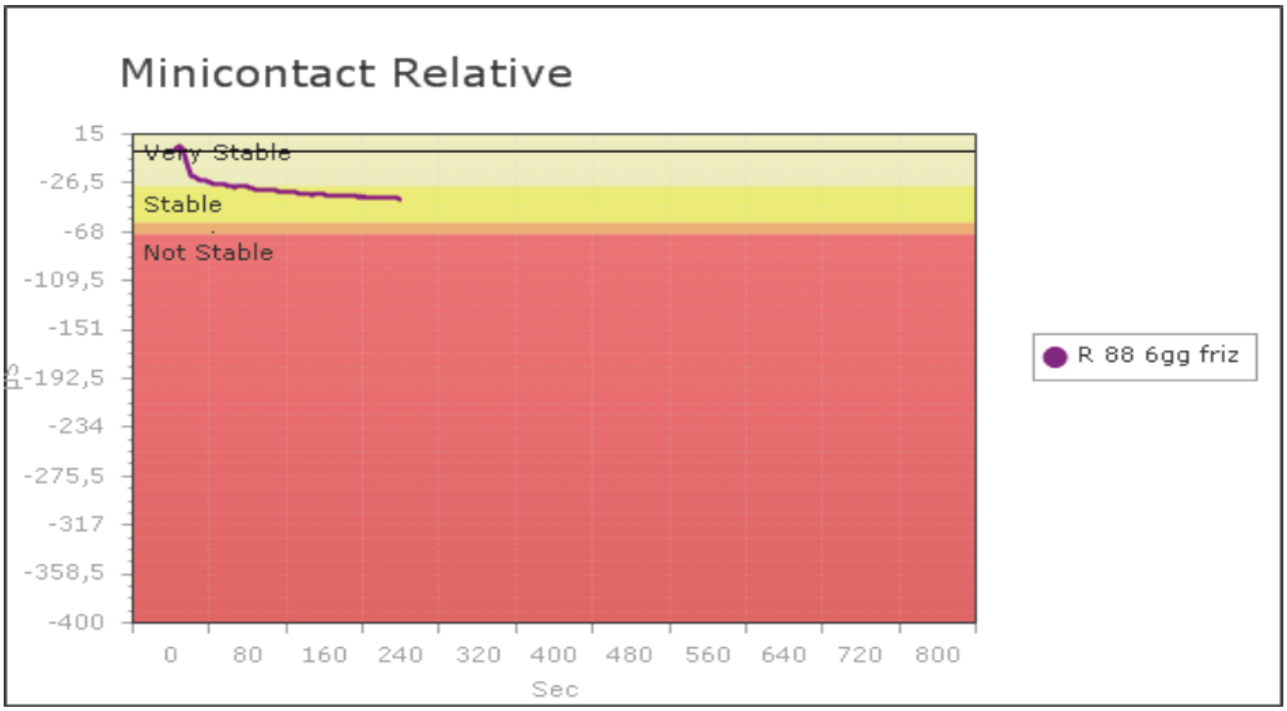
When it is at room temperature, 50 ml of sample are kept again at -4 ° C for 2 weeks. In the sample, however, after this period we don't find large amounts of precipitation, contrary to what could be expected considering the fall that we found in minicontatto analysis.

Therefore, the sample RS229, red grape juice, with a fall of 132.90 µS could consider at risk or mildly unstable.

SAMPLE **R88 NON stabilized** **Fall 302µS** **start 2600,00 µS** **to 2298,00 µS**



SAMPLE **R88 (6 Days -4°C)** **Fall 41,00µS** **start 2236,00µS** **to 2195,00µS**

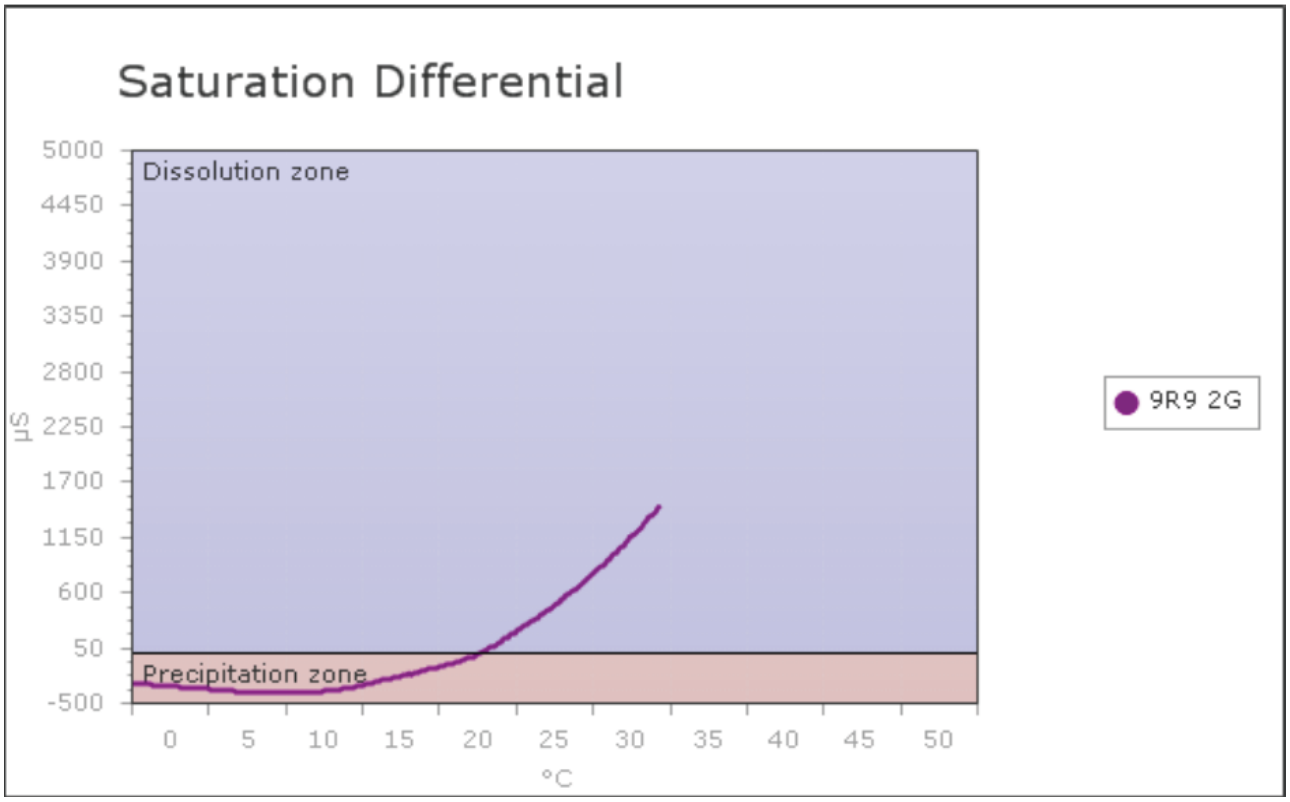


50 ml of sample R88 after storage at -4 ° C for 6 days was kept for two weeks at -4 ° C. After this period there is no precipitate.

A red grape juice in these conditions, falling 41.00 µS, can be considered stable.

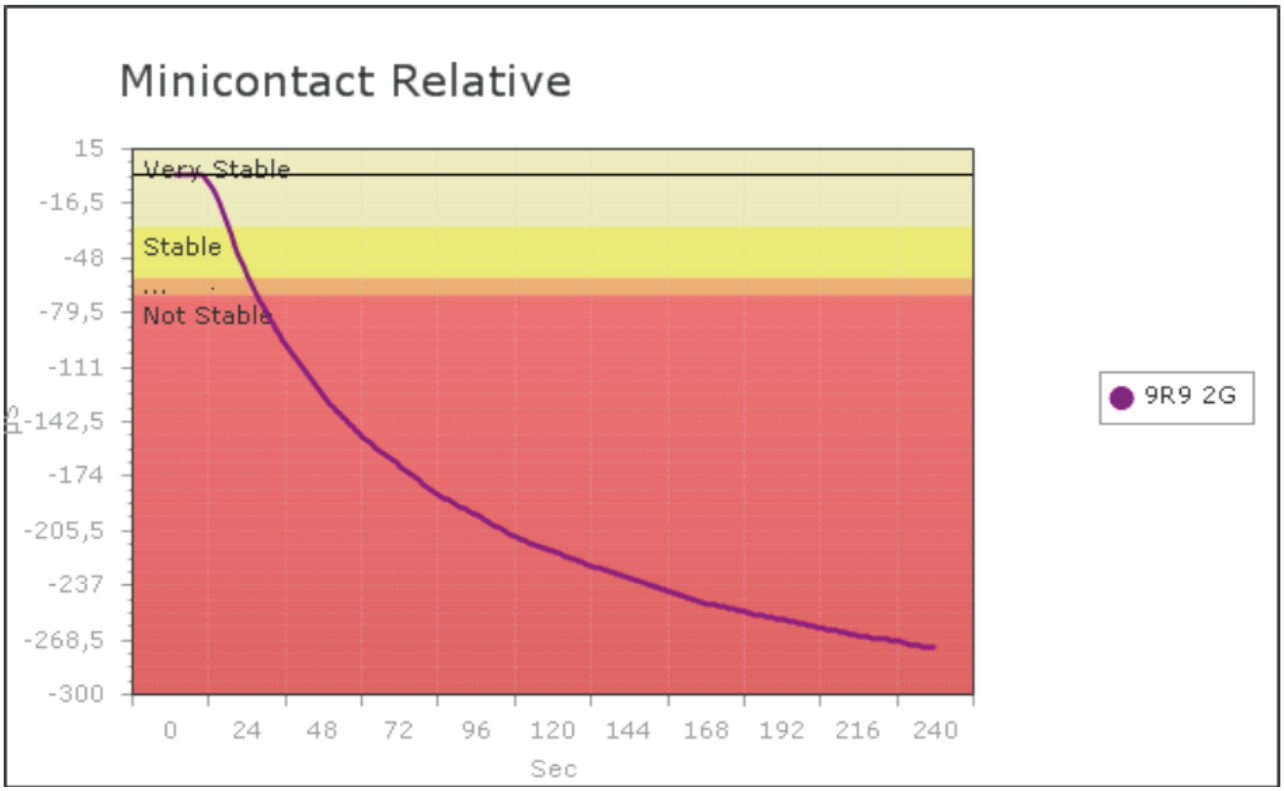
The sample 9R9, red grape juice, not stabilized, was analyzed for minicontatto and saturation point.

SAMPLE **9R9 NON Stabilized** **Minicontatto Fall 273µS** **Tsat 20° C**

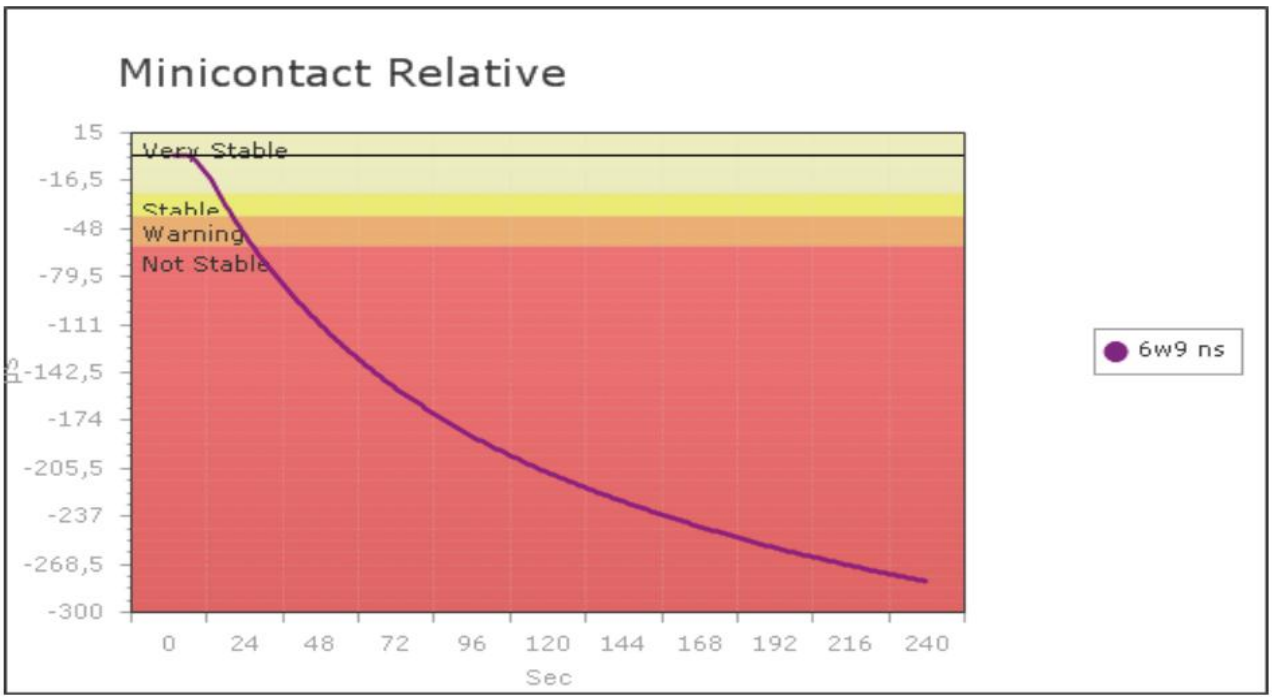


The high value of saturation temperature is understandable given the high degree of supersaturation found in grape juice.

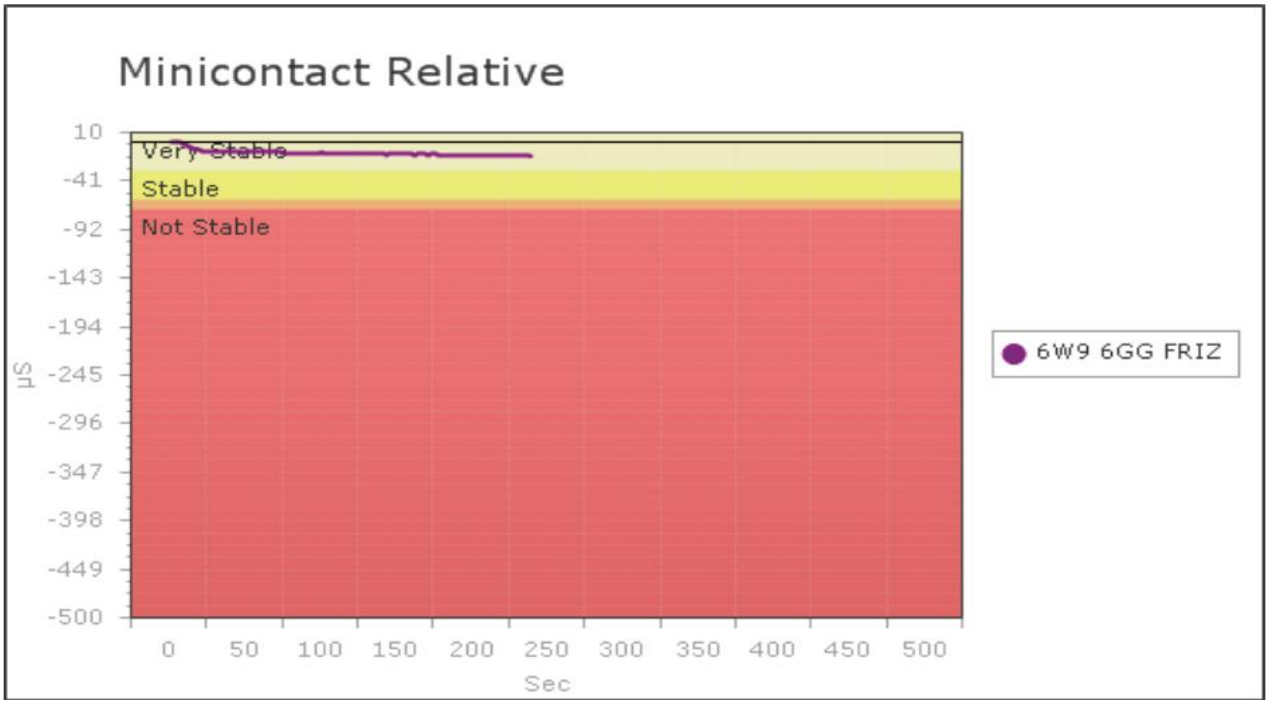
SAMPLE **9R9 NON Stabilized** **Fall 273,30µS** **start 2566,20µS** **to 2292,90µS**



SAMPLE **6W9 NON Stabilize** **Fall >280,00µS** **start 2412,10µS** **to < 2132,10µS**



SAMPLE 6W9 (6 Days -4°C) Fall 16,00µS start 1877,00µS to 1861,00µS



In this case, in graph of analysis of minicontatto is evident that the fall of conducivity is greater than how showed during 240 seconds of analyse, 280 µS. In fact, after 6 days of storage at -4 ° C, the initial value of conductivity is the value at which the conductivity tends during the analyse Minicontatto carried out before coldstorage.

The fall after storage at -4 ° C is 16µS, a white grape juice in these conditions can be considered very stable

CONCLUSIONI

The graphs of minicontatto of samples showed that the limits of stability used for wines are not applicable on grape juice.

GRAPE JUICE RED

VERY STABLE	**FALL < 40 µS**	
STABLE	**FALL 40-80 µS**	
AT RISK	**FALL 80-130 µS**	
INSTABLE	**FALL >130 µS**	

GRAPE JUICE WHITE

VERY STABLE	**FALL < 20 µS**	
STABLE	**FALL 20-60 µS**	
AT RISK	**FALL 60-110 µS**	
INSTABLE	**FALL >110 µS**	

NT:These parameters are indicative and relative to the experience in our laboratories and to tests carried out at the winery of origin of the samples. Don't take them us absolutely. These values are not to be considered absolute, but only to start a possible application of CheckStab instruments.All analysis MINICONTATTO were performed at 0° C.