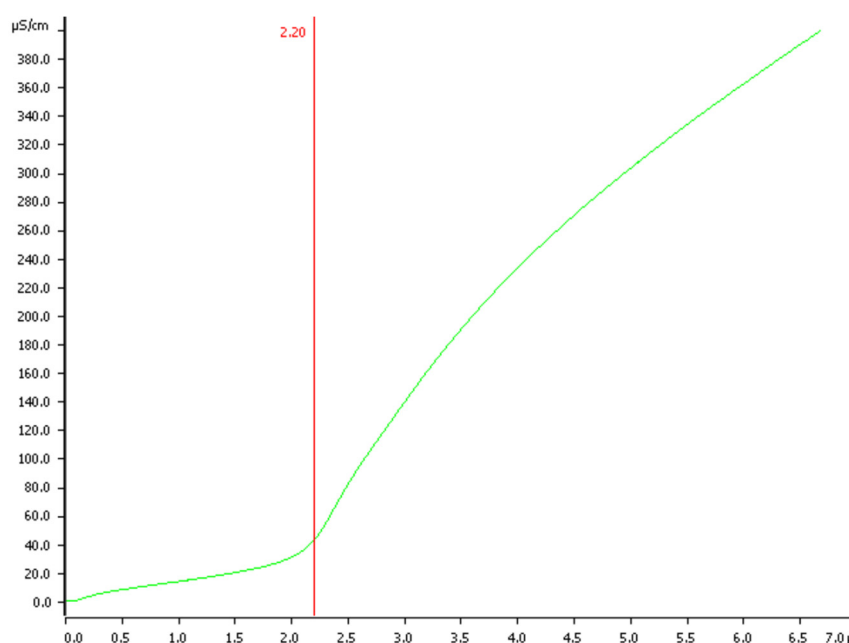


Oxidation stability of wine

Fast determination of oxidation stability without sample preparation



The determination of the oxidation stability of wine with the Rancimat is a newly developed method able to determine the antioxidant potential of wines. Different grapes as well as varied processing methods impart the color, taste, and antioxidative capacity for each wine blend or varietal. With the Rancimat and Polyethylene Glycol (PEG) methods, the antioxidant potential in different wines can be easily compared.

Red wines contain the highest amount of antioxidants. The total polyphenol content of red wine can vary between 700–4000 mg/L. Rosé and white wines only contain about 90–850 mg/L. The PEG method is used to compare the antioxidant capacity of different vintages and grape varieties. The induction time can be used as a quality criterion for different types of wine or different vintages.

In this Application Note, the oxidation stability of different wines is determined in this way.

Method description

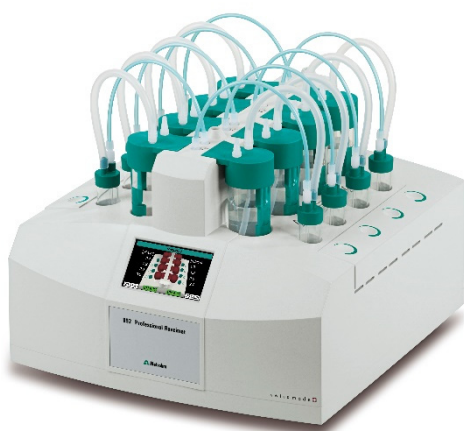
Samples

red wines
rosé wine
white wine

Sample preparation

No sample preparation is required.

Configuration



Analysis

3g of polyethylene glycol and 0.1g sample (wine) is weighed into the reaction vessel, and the analysis is started.

With the Rancimat method, the sample is exposed to an airflow at a constant temperature between 100–180 °C. Highly volatile, secondary oxidation products are fed into the measuring vessel with the air stream and absorbed there into the measuring liquid (demineralized water). The conductivity is measured continuously. The secondary oxidation products lead to an increase in the conductivity. The time until this increase in conductivity occurs is known as the induction time, which is a good indicator of oxidation stability.

In the PEG method, polyethylene glycol is used as the carrier material. The induction time depends on the amount of antioxidants. The more antioxidants available, the greater the oxidation stability. With this method, samples can be analyzed which cannot be determined with the conventional Rancimat method.

Results

Sample (n = 4)	Mean value / h	s(abs) / h	s(rel) / %
Pinot Noir, Badischer Landwein (red wine, Saint-Gregoire Germany)	2.10	0.09	4.1
Cabernet-Syrah, JP Chenet (red wine, Pays d'Oc France)	2.61	0.25	9.1
Cabernet Sauvignon (red wine, Valle central Chile)	1.56	0.03	2.1
Zinfandel rose (rosé wine, California USA)	0.54	0.04	6.8
Chenin Blanc (white wine, Western Cape W.O. South Africa)	0.54	0.04	7.0

Summary

The results show that red wines contained the highest number of antioxidants. With the PEG method, it is possible to obtain a statement about the constant quality of a wine over different vintages. The three measured red wines show a clear differentiation in anti-oxidative capacity.

Overall, the demonstrated method delivers acceptable values for all samples with $s(\text{rel}) \leq 10\%$.