PURPOSE OF THE TEST

Potassium is the most abundant cation in wine. Its concentration depends on both the variety of the grape, the soil conditions and growing procedures, and the methods used in the winemaking process. High values of potassium in the grape are associated with more basic musts, something that may adversely affect the quality of the wine. Although most potassium salts are soluble, potassium bitartrate decreases its solubility as the alcohol concentration increases, giving rise to precipitates that can be perceived as a loss of quality, even if do not affect the organoleptic properties of the wine.

METHOD

Potassium ion forms a stable precipitate with the tetraphenylborate able to remain in suspension, thus causing turbidity in the sample. The degree of turbidity, measured as the variation of absorbance at 578 nm, is proportional to the concentration of potassium.

CONTENT

R1	1 x 30 mL	Buffer, preservatives
R2	1 x 30 mL	Tetraphenylborate
CTRL	1 x 2 mL	Potassium chloride 750 mg/L (640 – 860 mg/L)
STD	1 x 5 mL	Potassium chloride 1500 mg/L

REAGENT PREPARATION

Reagents are ready to use and are stable up to expiry date as supplied when stored at 15-25 ºC. Do not freeze.

Discard if absorbance of blank is higher than 0.300 OD at 578 nm.

SAMPLES

The samples must be free of turbidity and particles. Centrifuge or filter if necessary. The presence of CO_2 introduces instability in the measure. Samples containing CO_2 must be degassed beforehand. In samples with very high colour intensity, the pigment may interfere with the measurement. Treat with polyvinylpolypyrrolidone (PVPP 0.1g for each 10 mL) to reduce the level of colour. Samples with concentration higher than the measurement range must be diluted accordingly with distilled water. Multiply the final result by the dilution factor.

PROCEDURE OVERVIEW

Treat standard, controls and samples as sample. Use distilled water as Blank.

Volumes stated below can be adjusted to other analytical procedures. Expected performance can vary if those ratios S:R1 are not used exactly as stated.

Pipette into a cuvette:

	Blank reaction	Test Reaction
Reagent 1	450 µL	450 µL
Distilled water	90 µL	--
Sample/Standard	--	90 µL

Mix, incubate at 37ºC for 1 minutes and read absorbance at 578 nm (A_1). Then add to cuvette:

	Reac. Blank	Reac. Sample
Reagent 2	450 µL	450 µL

Mix and incubate for 5 minutes at 37 ºC. Read absorbance at 578 nm (A_2)

Concentration of potassium is calculated as:

$$Potassium = \frac{(A_2 - 0.55xA_1)_{\text{sample}} - (A_2 - 0.55xA_1)_{\text{blank}}}{(A_2 - 0.55xA_1)_{\text{standard}} - (A_2 - 0.55xA_1)_{\text{blank}}} \; x \; C \text{ g/L}$$

Factor 0,55 is used to correct absorbance after adding R2. C is the concentration of standard as stated in the label.

ASSAY PARAMETERS FOR ANALYZERS DIONYSOS®

Dionysos model	**150**	**240**
Name	POTASSIUM	
Method	End Point A	
Direction	Increasing	
Main Wavelength	578	
Sec. Wavelength	--	
Sample	4	
Reagent 1	200	
Reagent 2	200	
Calibration	Linear	
Blank cycle [150 | 240]	3 - 4	3 - 4
Reading cycle [150 | 240]	14 - 15	20 - 21
Units	mg/L	
Decimals	0	
Measure range	20 ~ 1500	
R1 Lim. Abs	3000	
Ratio Dil. Auto.	–	
Vol. Sample Dil. Auto	–	

Procedure is linear up to 1500 mg/L. Calibrate with a single point using the highest concentration standard or with several points as per your quality procedures.

PERFORMANCE

Limit of quantification: 20 mg/L
Limit of linearity: 1500 mg/L

NOTES

It is recommended to use wine controls to verify quality of calibration. Each laboratory should establish its own quality criteria for acceptance, as well as proper corrective action procedures in case of rejection.

REFERENCES

1. Compendium of International methods of analysis – OIV, Vol 1&2 (2008).
2. Bermeyer, HU. Methods of Enzymatic Analysis, 2nd Ed. Vol. 1, p. 112-117. Academic Press, Inc. NY.