Wine Colour Analysis using

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Introduction

Colour is one of the most important parameters to analyse wine quality. The presence of anthocyanin pigment is responsible for the richness of colour in red wine. The change in the structure of anthocyanin is generally attributed towards the apparent change in colour in red wines. White wines and rose wines also go through colour change due to oxidation of tanins over time. Sometimes defective brewing process also results in bacterial growth leading to contamination and consequent colour change.

UV-vis spectroscopy is a non-destructive technique which does not interfere with the physical and chemical characteristics of wine samples. It is generally used to measure the colour intensity and wine hue to determine quality.

Wine Colour Intensity

Generally, higher concentration and opacity of colour means higher intensity. The colour of wine indicates age, grape variety, density of flavor, acidity and more. The absorption measurements in the violet, green and red areas of the visible spectrum are used to analyse the darkness in wine. A good quality white wine is supposed to show low absorption in these areas.

Wine Hue

Wine hue indicates the tone of the wine. It is a ratio of absorption between 420 nm (violet) and 520 nm (green) in the spectral region.

Instrument and sample

- OPTIZEN Alpha double beam spectrophotometer
- Quartz cuvette
- Measuring pipette
- Standard laboratory glassware
- Red wine
- White wine
- Rose wine
- Distilled water

Sample preparation

1. Fill labelled cuvettes with diluted red wine (dilution factor 5).
2. Do the same with the white wine and rose (dilution factor 1 in both cases).
3. Fill an additional cuvette with distilled water and treat it as blank solution for the baseline correction.

Measurement Setting

Perform the measurement the following method parameters:
- · Method: Fixed wavelength
- · Path length: 1 cm
- · Dilution factor: 1 (5 in case of red wine)
- · No of Wavelengths: 3
- · Wavelength selection: 420, 520, 620 nm
- · Background correction: None

Calculations

Wine hue = A (420) / A (520)

Wine colour intensity = A (420) + A (520) + A (620)

Results

Wine Sample (Hue Value)	Acceptance Criteria
Red Wine	0.8 - 1.2
White Wine	> 1.2

Sample	A(420)	A(420)	A(420)	Wine colour Intensity	Wine Hue
Red Wine 1	0.5988	0.6811	0.1671	7.235	0.8792
Red Wine 2	0.5406	0.5881	0.1251	6.269	0.9192
White Wine	0.1338	0.0182	0.0036	0.1556	7.3516
Rose Wine	0.4821	0.2785	0.062	0.8226	1.7311

* Wine colour intensity values obtained after dilution factor calculation.

Conclusion

The measurements and results of this batch of wine samples comply with the acceptance criteria.

Related models: **OPTIZEN Alpha**

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