A new age for sulfur dioxide testing

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Introduction

Sulfur dioxide is used as a preservative in wine and there are restrictions limiting the amount that can be added in most wine producing countries. Careful monitoring and control of SO_2 can protect wine from microbial contamination, preventing spoilage and decrease in quality and taste.

Spectrophotometric based SO_2 methods present an important progression in SO_2 testing as they are rapid, reliable, economical and can be automated using discrete analysers (DA) (Gilchrist et al. 1999). Recent attempts to offer a spectrophotometric alternative to the aspiration method for free SO_2 analysis have been based around formaldehyde/pararosaniline chemistry and therefore pose occupational health and safety concerns for many winery laboratories (Grant, 1947).

The Vintessential SO_2 test kits are a fast, safe and easy way to determine the amount of sulfur dioxide in wine samples, without the need for the laborious setup associated with traditional methods. This method provides a novel, fast and easy way to determine the amount of sulfur dioxide in wine, can be used for both white and red wines and does not contain formaldehyde based solutions.

Method

The amount of sulfite present in wine is measured by monitoring the reaction with a colour changing compound (chromogen).

The reduction of the chromogen leads to formation of a strongly absorbing compound which can be measured at 340 nm using a DA.

The measurement of the activated chromogen is stoichiometrically proportional to the amount of sulfite present.

Results and Conclusion

There is a linear correlation between the DA method and traditional aspiration as shown in Figure 1 (A-D) for Free SO_2 and (A-D) for Total SO_2.

Rigorous testing of the method on four different DA's for wine, beer and cider show that the method is a fast and reproducible alternative to traditional aspiration (Table 1).

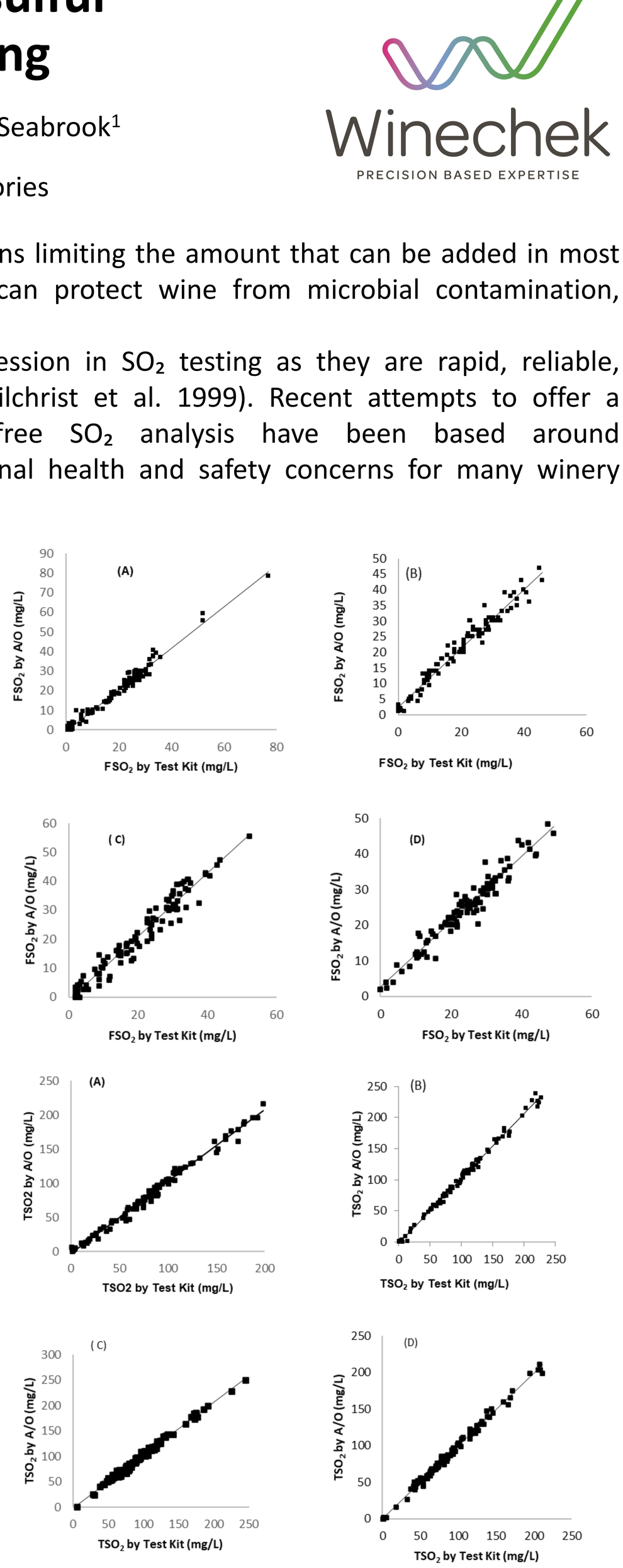

Figure 1 A-D. Correlation between aspiration and SO_2 kits for (A) Chemwell 2910, (B) Winery Pro, (C) Thermo® Arena, (D) Thermo® Gallery.

Table 1. Statistical analysis of method performance.

	2910		WineryPro		Arena		Gallery	
	FSO_2 n = 102	TSO_2 n = 100	FSO_2 n = 111	TSO_2 n = 102	FSO_2 n = 99	TSO_2 n = 101	FSO_2 n = 98	TSO_2 n = 109
Ave difference between test kit & A/O (mg/L)	0	2	1	2	1	2	1	0
Correlation (R^2)	0.97	0.99	0.96	0.99	0.95	0.99	0.92	0.99
Repeatability SD (mg/L)	0.98	1.92	0.63	1.29	0.79	1.35	0.57	1.60
Reproducibility SD (mg/L)			0.96	2.85	0.91	2.06	1.02	

References

Gilchrist A, Nobbs J. Colorimetry, theory. Encyclopedia of spectroscopy and spectrometry. 1999 Jan 1:337-43.

Grant WM. Colorimetric determination of sulfur dioxide. Analytical Chemistry. 1947 May 1;19(5):345-6.