

## Detection of some wine flaws with rapid correlative analytical methods – preliminary results

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### Abstract

With the increasing demand for high-quality wines there is a need for instrumental analytical methods to test and monitor the quality in large quantities. The correlative analytical methods offer alternative solutions of the traditional human sensory tests and classical analytical approaches. With these novel methods special quality characteristics can be tested rapidly and with good accuracy, giving the opportunity for early detection of the appearance of some defects causing wine faults and flaws. In our development, wines with artificially produced flaws were examined using near-infrared (NIR) spectroscopy and electronic nose technology based on ultrafast gas chromatography. The acetic acid, typical for ‘volatile acidity’, was used in a concentration-range of 0.25 - 1 g/l, and the 4-ethylphenol (4EP) and 4-ethylguaiacol (4EG), which cause the barn smell characteristic of ‘Brett’ wine, were used in a concentration-range of 0.2 - 8 mg/l, matching the human sensory thresholds. With NIR spectroscopy, 4EP and 4EG proved to be poorly estimable, however, accurate results ( $R^2 > 0.9$ ) were obtained for acetic acid. The applied electronic nose was not suitable for the detection of acetic acid, however, higher concentrations of 4EP and 4EG ( $> 1$  mg/l) were detectable. To be able to measure lower concentrations ( $< 1$  mg/l), various sample preparations were used, with which the dissolved volatile compounds were released, helping to extend the detectability.