

**CHARACTERISATION OF METHOXYPYRAZINES IN WINES BY SPME
AND COMPREHENSIVE TWO DIMENSIONAL GAS
CHROMATOGRAPHY-ISOTOPE DILUTION TIME OF FLIGHT MASS
SPECTROMETRY (GC×GC-IDTOFMS)**

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This study focussed upon the determination of methoxypyrazines analytes in model wines. Methoxypyrazines are strikingly potent odorants with a bell pepper-like aroma, and are important sensory descriptors in particular wine varieties. Extraction of the methoxypyrazines analytes was achieved using headspace solid phase microextraction (HS-SPME), whereby extraction time and temperature were simultaneously optimised using a Box-Behnken experimental design. A labelled methoxypyrazines analogue was used as the internal standard, ensuring that the target and standard analytes exhibited the same response factors, and so would be extracted to the same extent by the SPME fiber. This ensures the quantitative fidelity of the HS-SPME method.

Analysis was performed using comprehensive two-dimensional gas chromatography, resulting in a significant increase in signal intensity compared to single dimension gas chromatography (GC). This was critical, since methoxypyrazines exist in trace and ultra-trace concentrations, and in Sauvignon blanc wine, iso-butylmethoxypyrazine concentrations have ranged from 0.6-38.1 ng/L [1]. The GC×GC was coupled to a fast scanning time of flight mass spectrometer, and quantitation of the analytes was achieved using stable isotope dilution assays. The combined HS-SPME GC×GC-IDTOFMS method represents a highly sensitive and novel approach for the quantitative determination of methoxypyrazines in wines.

[1] M.J. Lacey, M.S.Allen, R.L.N. Harris and W.V. Brown. Methoxypyrazines in Sauvignon blanc grapes and wines. *Am. J. Enol. Vitic.* 42 (1991) 103.