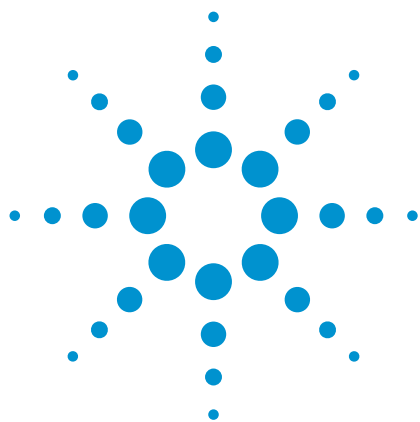




Fast analysis of resveratrol in red wine using the Agilent 1290 Infinity LC System

Application Note

Food

Author

Keiko Nakamura
Agilent Technologies Japan
Hachioji, Tokyo

Abstract

Red wine contains various polyphenols, which function as antioxidants. This Application Note shows the analysis of one of the antioxidant resveratrol in red wine. A recent study found that resveratrol improves health and extends maximum lifespans in various species¹. The fast and highly sensitive analysis of resveratrol was done on an Agilent 1290 Infinity LC using an Agilent ZORBAX RRHD sub-2 μ m column and the Max-Light high-sensitivity flow cell with 60 mm path length.

Configuration

Agilent 1290 Infinity LC System
Agilent 1290 Infinity LC Binary Pump (G4220A)
Agilent 1290 Infinity LC Autosampler (G4226A)
Agilent 1290 Infinity LC Thermostatted Column Compartment (G1316C)
Agilent 1290 Infinity LC Diode Array Detector with 60 mm Max-Light high-sensitivity flow cell (G4212A)
System control by OpenLab CDS ChemStation Edition software

Analytical conditions

Column:	Agilent ZORBAX RRHD SB-C18 2.1 x 100 mm, 1.8 μ m
Mobile phase:	A = Water + 0.1% formic acid, B = Acetonitrile + 0.1 % formic acid
Isocratic:	25 % B
Flow rate:	0.5 mL/min
Column temp.:	40 °C
Injection vol.:	1 μ L
Detection:	320 nm/4, reference off



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Experimental

A chromatogram of the standard solution is shown in Figure 1. The retention time of resveratrol is 1.91 min. Figure 2 shows the overlaid chromatograms of standard solutions at different concentration levels of 0.001, 0.0025 and 0.01 mg/L. With a S/N of 4.2 for the 0.001 mg/L solution even the lowest concentration was well over the limit of detection (LOD, S/N > 3). For the calibration, a set of external standards was used giving a good linearity with a R^2 value of 0.999 between concentrations from 0.001 to 0.1 mg/L (Figure 3). Precision of retention time and area was 0.12 % (RSD) and 3.32 % (RSD), respectively. For the analysis of a real-life sample, red wine was filtered through a 0.45 μm filter before injection. Figure 4 shows the chromatogram of a red wine sample containing 0.014 mg/L of resveratrol. For compound confirmation, the retention time of resveratrol was used and the UV spectrum of the peak was matched with a standard with a match factor 981. The total run time of the analysis was less than 3.5 minutes

Conclusion

This Application Notes shows the analysis of the antioxidant resveratrol in red wine in less than 4 minutes run time with excellent sensitivity, precision of area and retention time and linearity. The analysis of a real-life sample confirmed the good results.

References

1. "Resveratrol improves health and survival of mice on a high-calorie diet", Joseph A. Baur, Kevin J. Pearson, Nature, Volume 444 Number 7117 pp 337-342, 2006

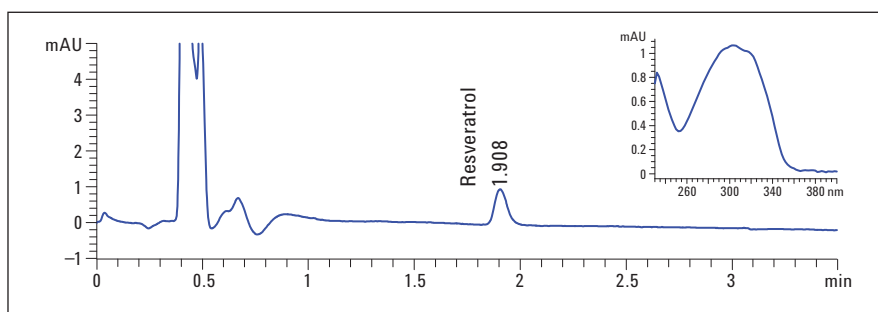


Figure 1
Chromatogram of reference solution (0.01 mg/L) and spectrum of resveratrol.

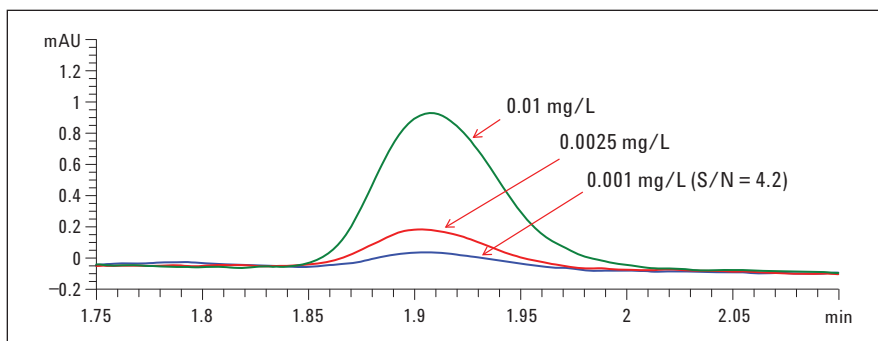


Figure 2
Chromatogram of standard solutions with different concentrations.

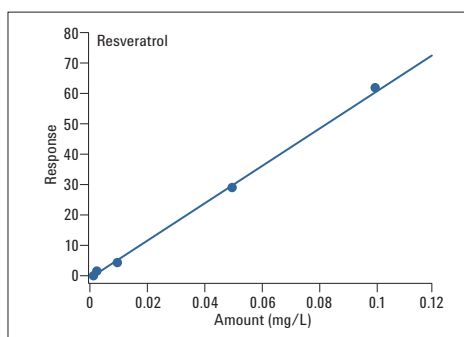


Figure 3
Calibration curve.

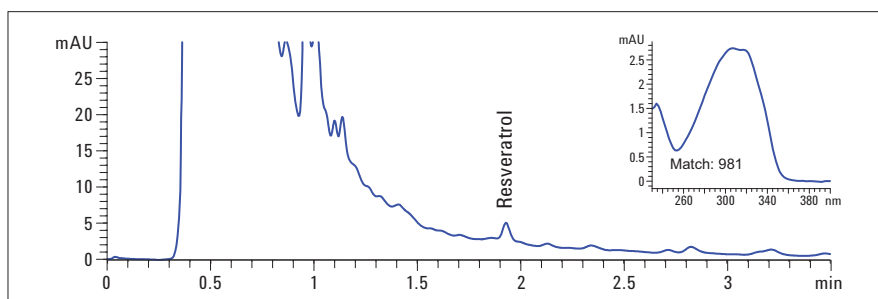


Figure 4
Chromatogram of red wine and spectrum of resveratrol.

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