

PT12 Comprehensive two dimensional gas chromatography with differential flow modulation and quadrupole mass spectrometry

Robert A. Shellie, Samuel D.H. Poynter

Australian Centre for Research on Separation Science (ACROSS), University of Tasmania, Hobart

GC-MS, multidimensional GC, essential oil

We report direct MS coupling with pneumatically modulated multidimensional GC.

Just about any modern gas chromatograph is suitable for fitment of a modulation interface for permits comprehensive multidimensional GC (GCxGC). Modulation can be achieved by thermal solute manipulation, by pneumatic modulation, or by using valve-based systems. Differential flow pneumatic-based modulators are gaining favour for their simplicity and robustness, but they employ high second dimension carrier gas flow rates (10 – 20 mL/min) for proper operation, so it is widely thought that this rules out direct mass spectrometric detection. GCxGC-MS has been performed using an open split interface [1] and with supersonic molecular beam MS [2] and we have recently shown that direct MS detection is possible [3].

This presentation will discuss advantages of GCxGC-MS and illustrate the approach used in our laboratory for performing GCxGC-MS with differential flow modulation. Examples of very high resolution essential oil analysis will be discussed to illustrate the improvement in detection and identification that GCxGC-MS offers over conventional GC-MS.

[1] J.W. Diehl, F.P. Di Sanzo, J. Chromatogr. A 2005, 1080: 157-165.

[2] M. Kochman, A. Gordin, T. Alon, A. Amirav, J. Chromatogr. A, 2006, 1129: 95-104.

[3] R.A. Shellie, LC-GC Eur. 2008, Nov: 572-578.