

THE EVOLVING ART OF LC/MS

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The technology behind the hyphenated on-line practice of liquid chromatography-mass spectrometry can be traced to significant work performed through the 1960s by a recognizable few. The legacy of that effort perhaps is today's single quadrupole LC/MS system. Predominantly found using an atmospheric pressure interface to the LC, it stands as an icon for the growth and interest in LC/MS that has changed the way scientists and technologists from a variety of industries approach analysis today. In rapid fashion over the last decade we have witnessed accessible accurate mass information, multiply charged high mass analysis for biological interests, and a necessary re-evaluation of the solution chemistry used in the chromatographic process. In a very real sense the practice of LC/MS is clearly neither LC with a mass detector or mass spectrometry with a liquid inlet - but a hybrid of the two worlds.

In a brief span of ten years, beginning in the late 1980s, the ponderous mass spectrometers relinquished the moving belts for thermospray, while a series of marketing decisions and alliances resulted in the culmination of a few significant manufacturing forces providing true benchtop, integrated applications-oriented LC/MS systems today⁵. While the mass spectrometer evolved for the benefit of chromatographic practice, chromatography has changed to accommodate the demands of the mass spectrometer. The non-volatile modifiers, stationary phases and requirements of a predominantly UV-driven practice have changed as dictated by the need to improve mass information while obtaining chromatographic fidelity. However, a count of presentations at a conference a few years ago indicating that 35% involved 'LC/MS' upon closer inspection showed many involved simple infusion rather than fully evolved chromatographic separations employing an LC column⁶. The presentation illustrates some of the critical points in the evolving practice and commercialization of LC/MS over this period with a look at some of the emerging technology that may find its way into practitioner's hands in the near future.

¹Balogh, M.P., *The Commercialization of LC-MS During 1987-1997: A Review of Ten Successful Years*, LC/GC, vol. 16 no 2, February 1998.

²Niessen, W.M.A. and Tinke, A.P., *Liquid chromatography-mass spectrometry General principles and instrumentation*, JChrom (A), 703 (1995).