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The emergence of low-cost compact MS chromatographic detectors for chemical analysis

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Highlights

- New trends in low-cost compact MS chromatographic detectors for chemical analysis
- Recent developments in LC-MS methods using compact MS detectors
- Compact MS instruments at half the cost of conventional spectrometers provides excellent detection sensitivity
- Use of Microsaic 3500 MiD, Advion Compact and Acquity QDa MS detectors across academia and industries
- Use of LC-mini MS for reaction monitoring, biomolecule / high-throughput microplate / impurities / degradation products / trace / PMIs analyzes

ABSTRACT:

An overview of recent progress in the development of compact mass spectrometers for use as chromatographic detectors in chemical analysis is presented. As the applications of HPLC-MS technologies have grown in recent years there has been a continued expansion of the approach to new user groups. Within the pharmaceutical industry, the recent development of small, inexpensive and quiet MS detectors for HPLC has enabled the rollout of this important technology well beyond the initial user base of researchers in drug metabolism and bioanalysis to the direct support of research areas such as discovery chemistry, process chemistry, chemical engineering, manufacturing and formulation sciences, with comparable broadening of the MS user base occurring in other industries and in academia. In this review we survey recent developments and applications ranging from reaction monitoring, biomolecule analysis and high-throughput microplate analysis to the identification and analysis of impurities, degradation products and potential mutagens, offering thoughts on current limitations and future directions.

Keywords: Compact MS; Liquid Chromatography-Mass Spectrometry; Method development; High-throughput analysis; Pharmaceutical analysis; Process chemistry support.