

## The Role of LC-MS in Forensic Toxicology

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Interfacing HPLC with MS already started in the 1970s, but applications in the field of forensic toxicology only emerged substantially later. Earlier interfaces, such as those based on continuous-flow fast atom bombardment, particle-beam and thermospray are now vanishing in the literature. On the other hand, the advent of atmospheric pressure ionization drastically increased the number of LC-MS applications, also in forensics.

API-based applications, i.e. electrospray ionization (ESI) and atmospheric pressure chemical ionization (APCI), are by far the most popular and this will probably not change in the near future. ESI seems to be more applicable to very polar and thermolabile compounds while APCI is more useful for apolar compounds, a lot of them inaccessible for other techniques such as GC-MS.

An overview will be given of the applications of LC-MS in forensic toxicology and more especially in the analysis of drugs of abuse in biological matrices.

Most of these applications include screening and confirmation of target compounds such as opiates, cocaine, amphetamines and related designer drugs, cannabinoids and LSD. However, systematic toxicological analysis (STA) i.e. using LC-MS as a screening technique for unknown compounds is much less encountered in literature.

Challenges for future research include the lowering of the high background ion current in the total ion chromatogram (TIC), the build-up of MS-libraries, and the elimination of matrix suppression. More recent developments such as the sonic spray interface may also offer new possibilities. The influence of eluent composition on ionization efficiency using this new interface will be compared to the more classical interfaces.