

CON-THE-030

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## CONFIRMATORY METHODS

### Chromatography-MS coupling

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#### • Context

Chromatography coupled to mass spectrometry is the current confirmatory method of choice in the field of residue and contaminant analysis, mainly because of uncomparable advantages in terms of both sensitivity and specificity. In addition to the main technical parameters to consider regarding the pure mass spectrometric aspects, this type of coupling introduces supplemental specificities linked to gas or liquid chromatographic considerations and/or ionisation interfaces. Then, the choice of GC-MS versus LC-MS related systems, the main theoretical analytical advantages and limitations of such equipments, the compatibilities and optimised performances of various type of mass filters combined to LC or GC, as well as some typical examples of application of these techniques are required information prior to eventual investment.

#### • General objective(s)

The first objective of this theoretical session is to describe the basic principles of chromatography-MS coupling technologies, i.e. fundamental aspects of gas and liquid chromatography which have direct impact and/or are of crucial importance when coupled to MS, main sources of potential troubleshootings associated to these techniques (matrix effect, ion suppression, crosstalk...). The second objective is to detail several real-case examples of application of GC-MS and LC-MS related techniques for the analysis of various classes of residues in order to illustrate and comment their main advantages and limitations.

#### • Main items

GC-MS and GC-MS<sup>n</sup> / LC-MS and LC-MS<sup>n</sup> / Ion Suppression / Application examples: steroids, beta-agonists, corticosteroids, antibiotics, growth hormone, pesticides...

#### • Pedagogical objectives

- ✓ To understand the link between chromatographic resolution and MS acquisition rate (dwell-time)
- ✓ To be aware about the last generation of ultra-resolutive chromatographic systems (GCxGC, fast LC)
- ✓ To know the 2 main causes and 3 main possible solutions to solve/minimise ion suppression phenomenon

#### • Pedagogical tools

- ✓ PowerPoint slide show (+ paper printout and PDF file copy)

#### • Duration

- ✓ 4 hours

#### • Pre-requisite

- ✓ Knowledge of the chemistry of contaminants of interest (REG-THE-010)
- ✓ Basics of MS (CON-THE-010, CON-THE-020)