

CON-THE-032

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## CONFIRMATORY METHODS

### Gas Chromatography-MS coupling

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#### • Context

Gas Chromatography coupled to mass spectrometry is the historical confirmatory method of choice for measuring many classes of residues and contaminants in biological matrices, mainly because of the extremely good performance achieved by these techniques for relatively non polar compounds in terms of chromatographic separation (for example complex mixtures of steroid and related metabolites or persistent organic pollutant congeners such as dioxins or PCB) or the variety of associated ionisation techniques. The very significant recent technological improvements on this type of instruments (last generation of bi-dimensional GCxGC and/or mass filter) also participate to this observed success and implementation of these techniques in control laboratories. In addition to the main technical parameters to consider regarding the pure mass spectrometric aspects, this type of coupling introduces supplemental specificities linked to chromatographic considerations and/or associated ionisation interfaces.

#### • General objective(s)

The first objective of this theoretical session is to describe the basic principles of gas chromatography-MS coupling technologies, i.e. fundamental aspects of gas chromatography which have direct impact and/or are of crucial importance when coupled to MS, main sources of potential troubleshootings associated to these techniques (derivatisation, injection modes, matrix effect, ion suppression, crosstalk...). The second objective is to detail several real-case examples of application of GC-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 / Fast-GC / GC-MS and GC-MS<sup>n</sup> / derivatisation / crosstalk / Application examples: steroids, mycotoxins, carbadox, ...

#### • Pedagogical objectives

- ✓ To understand the link between chromatographic resolution and MS acquisition rate (dwell-time)
- ✓ To be aware about the variety and respective applicability of derivatisation reactions

#### • Pedagogical tools

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

#### • Duration

- ✓ 2 hours

#### • Pre-requisite

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