

SmartNotes

How can software support the analysis of challenging samples with the DFS Magnetic Sector GC-HRMS?

QA

For especially challenging samples, no matter how good your sample clean-up is, your final extract always contains a certain amount of matrix. For example, sulfuric sediments or fly ashes are challenging for the sample clean-up for dioxin analysis. Squalene, a natural organic compound originally found in oil or plant sources, used in cosmetic or dermatological products, is a challenging sample type. In the worst-case scenario, when analyzed, the sample matrix can affect the performance of any analytical instruments. The consequence might be the failed determination of target compounds and it means for labs to need of redoing the analysis or in the worst case to repeat the sample preparation.

With the Smart MID feature of the Thermo Scientific™ DFS™ SmartTune Operating Software you can reduce the negative effects of complex matrices for their analysis with the Thermo Scientific™ DFS™ Magnetic Sector GC-HRMS. By determining all calibration parameters before the analysis (when no sample is present in the instrument), the lock mass scan can be narrowed, excluding potential matrix interference signals.



The analysis is performed on the DFS Magnetic Sector GC-HRMS which uses high resolution technology for the selectivity of different masses. This requires a calibration that matches the target mass positions.

The DFS Magnetic Sector GC-HRMS is equipped with a reference gas inlet system which allows to introduced reference gases such as PFK. The known ion masses of this reference gas are monitored during the whole analysis. The intensity variation range of these mass traces is the acceptance criteria defined in official regulation, as they are an indication for the quality of the sample preparation in terms of cleanness.

Unlike other technology the DFS Magnetic Sector features an automated real-time calibration, which requires the determination of starting parameters based on the reference gas. In the system the calibration is based on known ion masses of a reference gas.

The calibration is a two-step process. The first step is the critical one, as the determination requires an identification of the reference mass, known as lock mass. To identify the lock mass, a certain mass range section is scanned around the theoretical mass position of the lock mass.

When highly abundant matrix ions appear within this lock mass scan, two signals are detected: in addition to the correct lock mass ion, the interference ion is detected. In such a case, the interfering ion from the matrix can be misinterpreted as reference mass and affect the overall calibration.

In the standard approach the calibration is carried out during the analysis, when the matrix is already in the ion source.

With the Smart MID Feature all parameters for the calibration are determined before the analysis when no sample is present. This allows you to narrow the lock mass scan, which ensures the correct calibration by excluding potential matrix interference signals.

During the run there is a continued process of updating of the calibration. The calibration parameters are stored for the following runs.

No matter the analysis, the DFS Magnetic Sector GC-HRMS performs compliant Dioxins and POPs Analysis, supported by software features that are aimed at productivity and ease-of-use of your lab.



Find out more at thermofisher.com/DFS

ThermoFisher
SCIENTIFIC