

Fully Automated MOSH/MOAH Analysis

Hans-Joachim Huebschmann, Tobias Uber

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The MOSH/MOAH Challenge

- Mineral oil hydrocarbon residues are found in numerous food or food contact materials originating from e.g. recycled card board, printing inks, or even the production machinery.
- The mineral oil hydrocarbons are classified as saturated (MOSH) and aromatic hydrocarbons (MOAH) with very different toxicological context.
- MOAH compounds are considered genotoxic causing cancer. The EFSA confirmed 2023: LOD as low as analytically possible.
- Chromatographic separation of MOSH from MOAH can only be achieved by normal phase liquid chromatography (LC) collected as two separate fractions.
- Biogenic alkanes and olefins require prior online sample treatment to avoid overestimation for MOSH (AIOx clean-up) and even more serious for MOAH (per-acid epoxidation).
- Efficient sample analysis requires the transfer of the separated MOSH and MOAH LC fractions of approx. 450 µL for a parallel 2-channel GC separation while the LC column is backflushing.
- Quantitation has to be achieved for a wide range of chain length C10 to C50 by GC with FID detection (GC-FID).
- A dedicated data evaluation is required for the EFSA compatible reporting according to different C-chain length (Chrolibri).

Automated AIOx Clean-up

- Recommended to avoid a MOSH overestimation by biogenic alkanes, occurring e.g. in olive oil, coconut oil and others.
- Retained by an in-line AIOx-column for the MOSH fraction.

Automated Expoxidation

- Recommended to avoid a MOAH overestimation by biogenic olefins, occurring e.g. in palm oil products.
- Removal by online oxidation with per-benzoic acid (mCPBA) or per-formic acid during LC separation.

Dual GC-FID Configuration

- Dual pre-column with solvent vapor exits (SVE) for LC fraction transfer.
- Parallel dual channel dual FID analysis for fast results.
- Full flow and time control by the CHRONECT interface box.

Conclusion

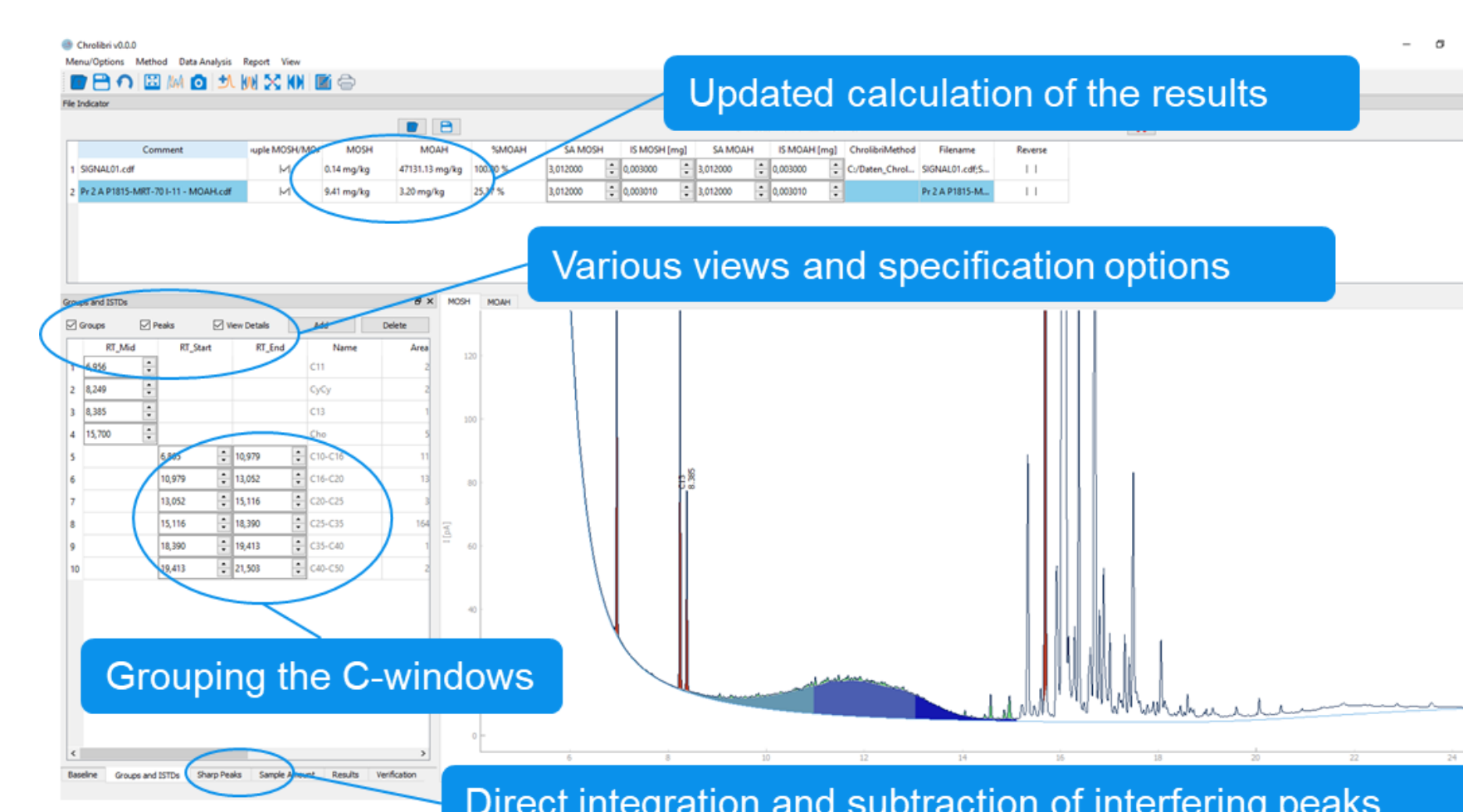
- Based on more than ten years of experience in MOH analysis
- 2 channel GC-FID setup, optional direct coupling to GCxGC-MS
- Automated online epoxidation and AIOx clean-up
- Chrolibri EFSA compliant evaluation and reporting software
- Comprehensive 250 pages user handbook
- Optional: MOSH depletion for cosmetics and Fract-and-Collect
- Optional: Fully automated workflow including saponification
- Approved consumables for MOSH/MOAH analysis

Automated MOSH/MOAH System

A hydrocarbon free LC tower with UV detector, and a dual channel dual FID GC system with solvent vapor vents and interface box is automated by the CHRONECT PAL system with mounted valves and modules using syringe tools.



Efficient Reporting



The new dedicated Chrolibri software provides all tools for integration of C-chain lengths. Full reporting with export options to xls, pdf, or LIMS.