



ORBION

High Resolution Multi-Pressure Chemical Ionization Mass Spectrometer

Built to resolve complex air chemistry

High Resolution

Atmospheric chemistry involves thousands of compounds, many with nearly identical masses.

High-resolution accurate-mass mass spectrometry (HRAM-MS), with resolving power up to **240,000**, separates these subtle differences, delivering fully resolved peaks and clear molecular detail.

- **Unveiling Hidden Species**

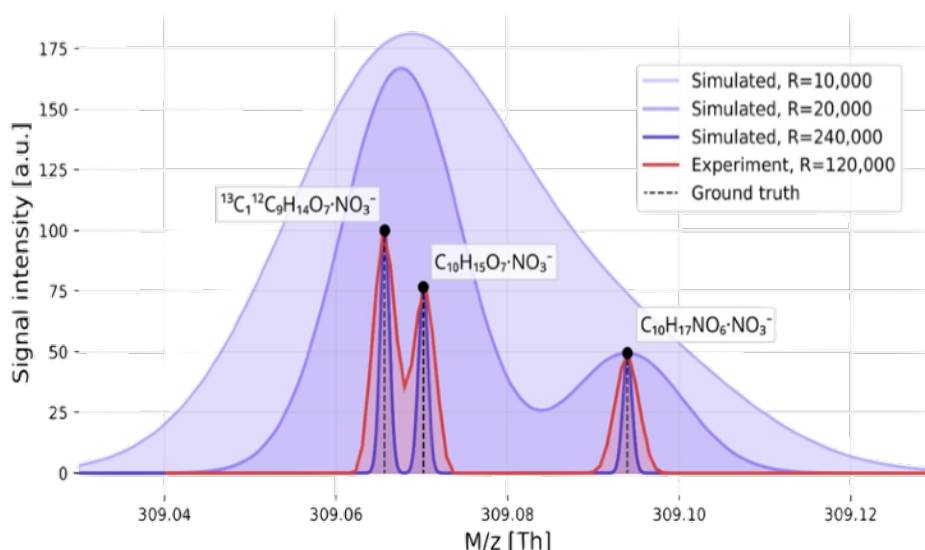
High resolving power brings previously merged signals into view.

- **Formula Assignment**

With **mass accuracy better than 1 ppm**, HRAM-MS constrains elemental compositions and turns spectral peaks into confident molecular identities.

- **Simplified Data Analysis**

Cleaner spectra reduce manual interpretation, streamline workflows, and enable faster scientific insight.



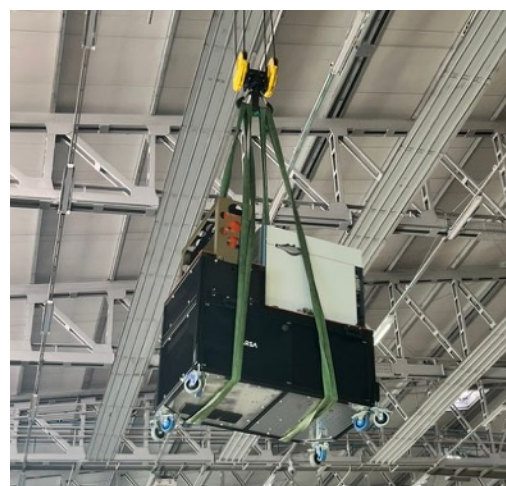
Example near m/z 309: isobaric nitrate species (incl. ^{13}C isotopologue) are indistinguishable at resolution of 10k–20k but clearly resolved at $\geq 120\text{k}$.

Field Ready

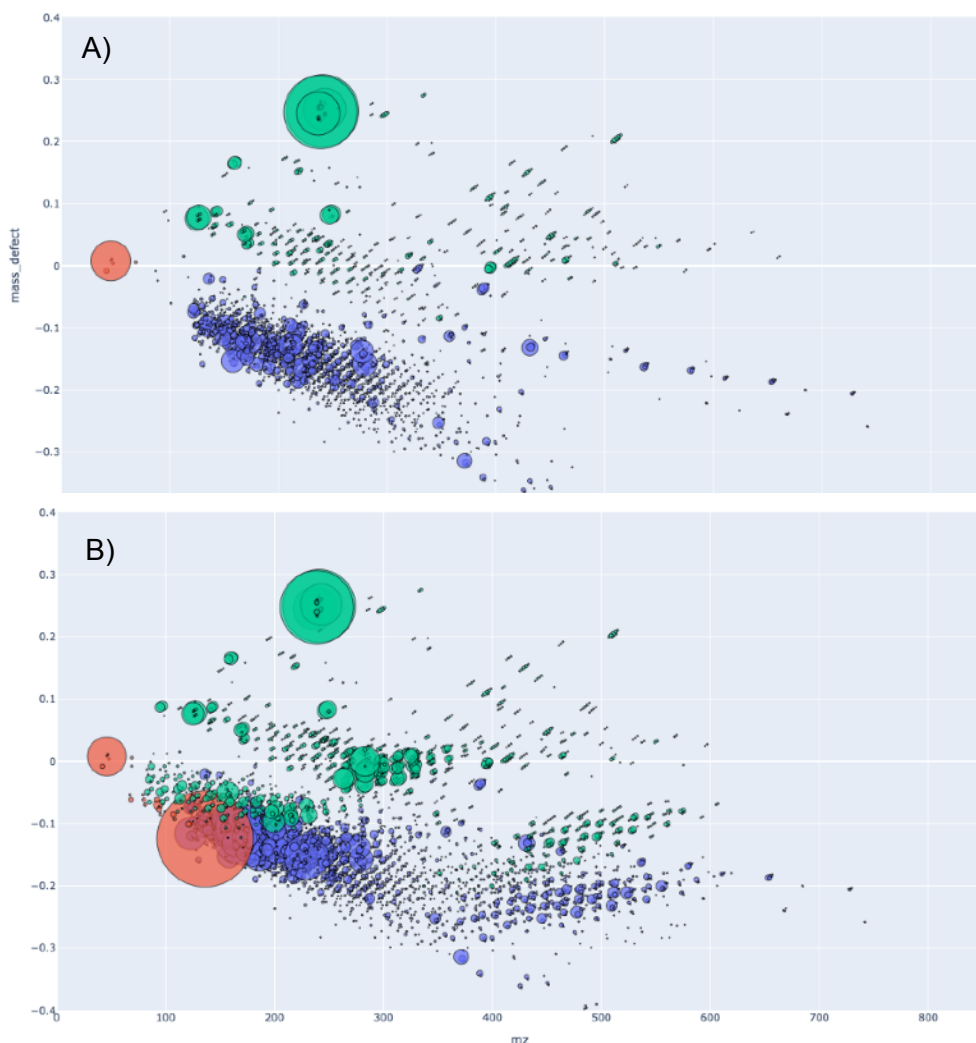
Orbion is a single, integrated system engineered for reliability and ease of use.

- **Uses safe, solid-state reagents** — eliminates hazardous chemicals and routine servicing.
- **Automates key workflows** — enables fast setup and continuous, unattended operation.
- **Combines all components** — delivers full performance from lab bench to field site.

Built as one system, Orbion delivers reliable performance from the lab to the field.



Broad Coverage



Multi-Pressure Chemical Ionization (MPCI) enables Orbion to detect a wide range of compounds in parallel — from volatile organics to acids, amines, and oxidation products. Automatic cycling between reagent ions (NO_3^- , Ur^+ , Fluoranthene $^+$) captures complex chemistry in real time.

In the *orange-peel experiment*, Orbion captures the full chemical cascade — from fresh emissions of volatile hydrocarbons to secondary products — all with one instrument.

Mass defect plot of indoor air spectra before (A) and after (B) peeling an orange.

Organized Data

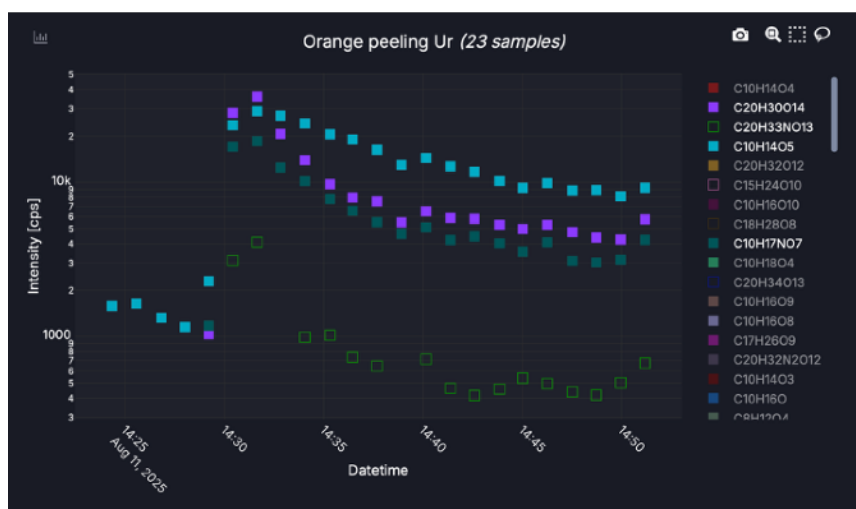
Orbion integrates seamlessly with **Mascope**, a collaborative, open-source data platform that automates ingest, processing, and visualization.

Mascope's built-in tools and JupyterLab connectivity simplify analysis while ensuring reproducibility.

Highlights:

- shared workspaces
- quality-control visualizations
- extensible Python and API workflows.

With Orbion and Mascope, atmospheric data flow naturally from measurement to scientific discovery.



*Built-in browser visualizations
Fast inspection, target analysis and QC for every batch and file*

Overview

Orbion is a deeply integrated system comprising next-gen chemical ionization, high resolution, accurate mass (HRAM) mass analyzers & an open-source analysis platform delivered as a single, validated instrument.

Resolving power 120,000–240,000

Clear molecular separation and formula identification.

Sub-pptv detection limits

Confidently tracks reactive species at ultra-trace level.

Maintenance-free solid reagents

Minimal interventions, consistent uptime.

Fast polarity & ion switching

Automated mode-cycling in seconds without compromising the results.

Wide chemical coverage

VOCs · Amines · Acids · HOMs/OOMs

Analysis built for discovery

Live dashboards and automated processing; focus on insight, not peak fitting.

Size / Weight / Power

H1400 × W730 × L1240 mm excl. pump

280kg excl. pump

Complete system 3000W

Gases

Nitrogen 99% HP 35 l/min

Nitrogen 99.999% UHP 0.03 l/min

Can be supplied by a single nitrogen generator

Operating environment

Temperature 18–27 °C

Max. temp. fluctuation 0.5 °C / min

Humidity 20–80% non-condensing

Transport & Installation

Transit case for easy transportation

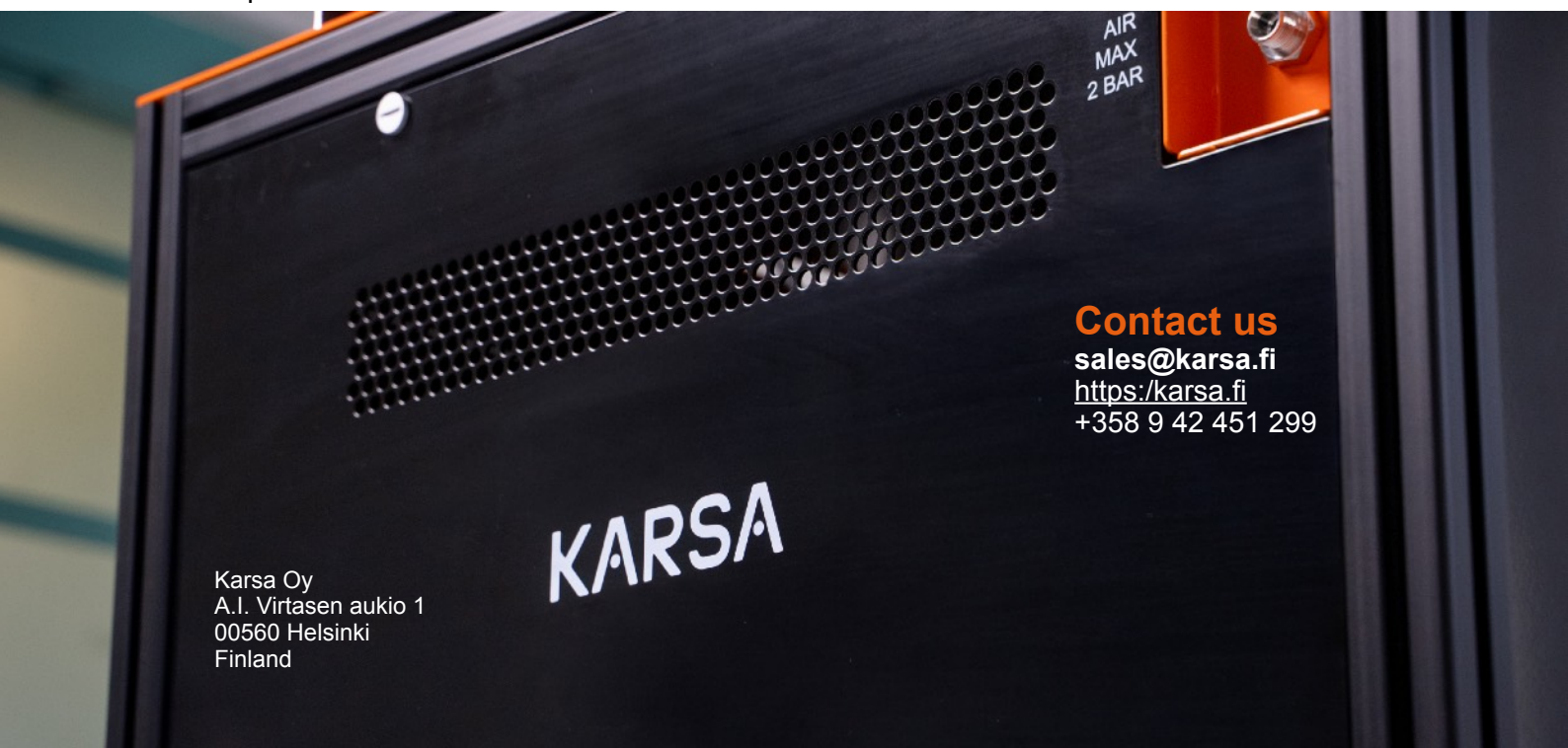
60 minute to set up

first measurements in 12 hours

Three models

	Orbion 120	Orbion 180	Orbion 240
mass analyzer resolution $\Delta M/M$ at m/z 200	Up to 120,000	Up to 180,000	Up to 240,000
MS/MS capabilities	yes	no	yes
polarity/reagent switching	up to 1.4 Hz, 0.1 Hz global		
mass accuracy	1 ppm RMS with lock mass		

See full specifications for details



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