



Vocus IMS

Ion mobility mass spectrometry for real-time monitoring of isomer populations



Ideal for applications requiring fast, sensitive, real-time isomer separation



Overview

When a compound is masked by either an isomeric or isobaric interference, this presents ambiguity in analysis. Interferences introduce uncertainties in mass spectrum peak identification as there is no definitive measurement of the structures contributing to a mass spectrum peak.

TOFWERK's Vocus CI-IMS-TOF conducts isomer separations on a much faster timescale than GC, providing powerful utility for those needing fast isomer separation analysis.

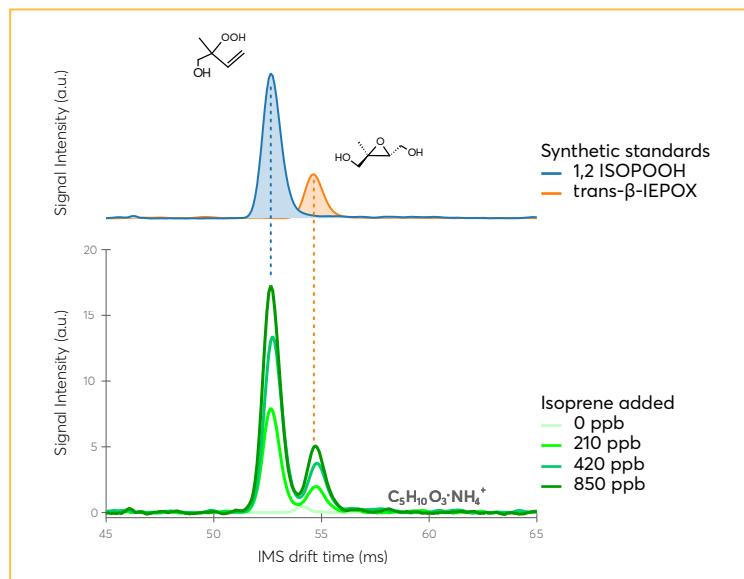
Features

- Fast isomer separation (<100 ms)
- pptV limits of detection
- PTR and Aim Reactor compatibility
- Toggle between MS and IMS modes

Analyzing Isoprene Oxidation Isomers

Isoprene oxidation chemistry has been well characterized by the atmospheric science community. During this process, several isomeric species are produced, including the isoprene epoxydiols (IEPOX) and isoprene hydroxy hydroperoxides (ISOPOOH). As these have the same empirical formula (e.g., $C_5H_{10}O_3$), they cannot be differentiated using mass spectrometry alone.

By reproducing atmospheric conditions in an oxidation flow reactor, we produce a mixture of species and use ion mobility to reveal the populations of specific isomers or isomer families.



Mobility analysis of the $C_5H_{10}O_3$ mass channel reveals at least two prominent peaks (green traces), which increase in intensity when the concentration of isoprene is increased while the OH· concentration remains constant. By utilizing chemical standards of the proposed chemical intermediates, we identify the first and second peaks in the mobility distribution as being consistent with 1,2-ISOPOOH (blue trace) and trans-β-IEPOX (orange trace), respectively.

System Specifications

Reactor Compatibility	PTR and Aim
Sensitivity cps/ppb	10 000
Mass Resolution	10 000
IMS resolution ($\Delta t/t$) for trimethylbenzene	> 70
LOD (pptv, 1 min)	< 10 pptv in 1 min typical
Operating Temperature Humidity	10-40 °C <90%
Dimension Weight Power	787 x 600 x 1517 mm 250 kg ~850 W
Certification	CE

MOBILion is the exclusive licensee of the SLIM technology for commercialization purposes. TOFWERK has been authorized to implement the proprietary technology in select products.