

What's in your Air?

Benefits of SIFT-MS
for protecting the
Environment and
People.



| | |
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Simply. Faster.

Dr. David Müller – Applications Scientist - Syft Technologies GmbH
Marino Beenhakker – Systems Engineer - Syft Technologies NZ

Presentation outline

Overview of Syft Technologies and our products

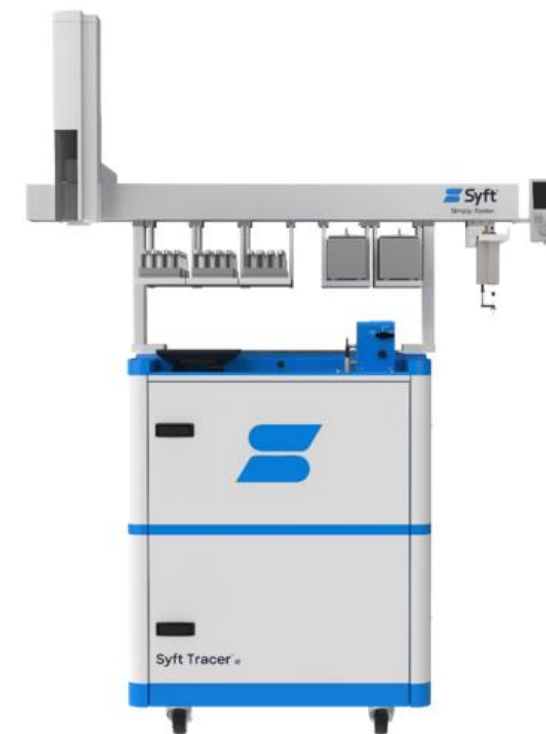
What is SIFT-MS

Case Study 1 - Ambient monitoring in New Zealand

Case Study 2 - PFAS measurement in consumer goods

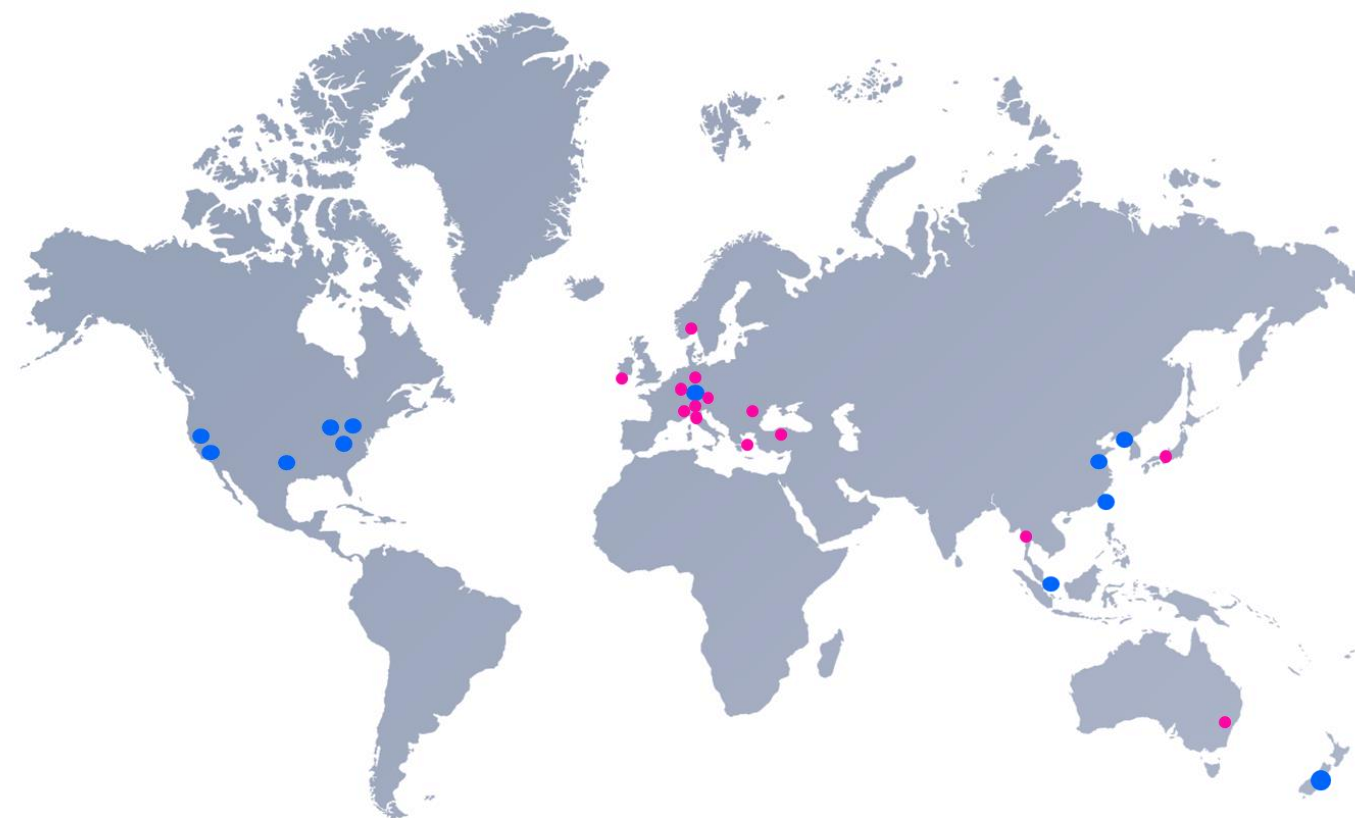
Syft Tracer Pharm11

Summary



Syft Technologies: More than just technology!

Global customer support offices, 24/7 service and support, application development support and more!



● Syft offices

| | |
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Clients and Industries

We work with a range of clients across countries, industries, and applications. We bring global experience in providing solutions to problems.

| Semiconductor | Safety & CBRNE | Environmental | Pharmaceutical | Consumer Goods | Other Industries |
|---------------|----------------|---------------|----------------|----------------|------------------|
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What Makes SIFT-MS Special?



Real-time, dynamic analysis, data in seconds



Enhanced selectivity for VOCs & Inorganics



Great sensitivity at ppt level



Quantitative compound identification



High throughput 21 CFR Part 11 compatible



SIFT-MS

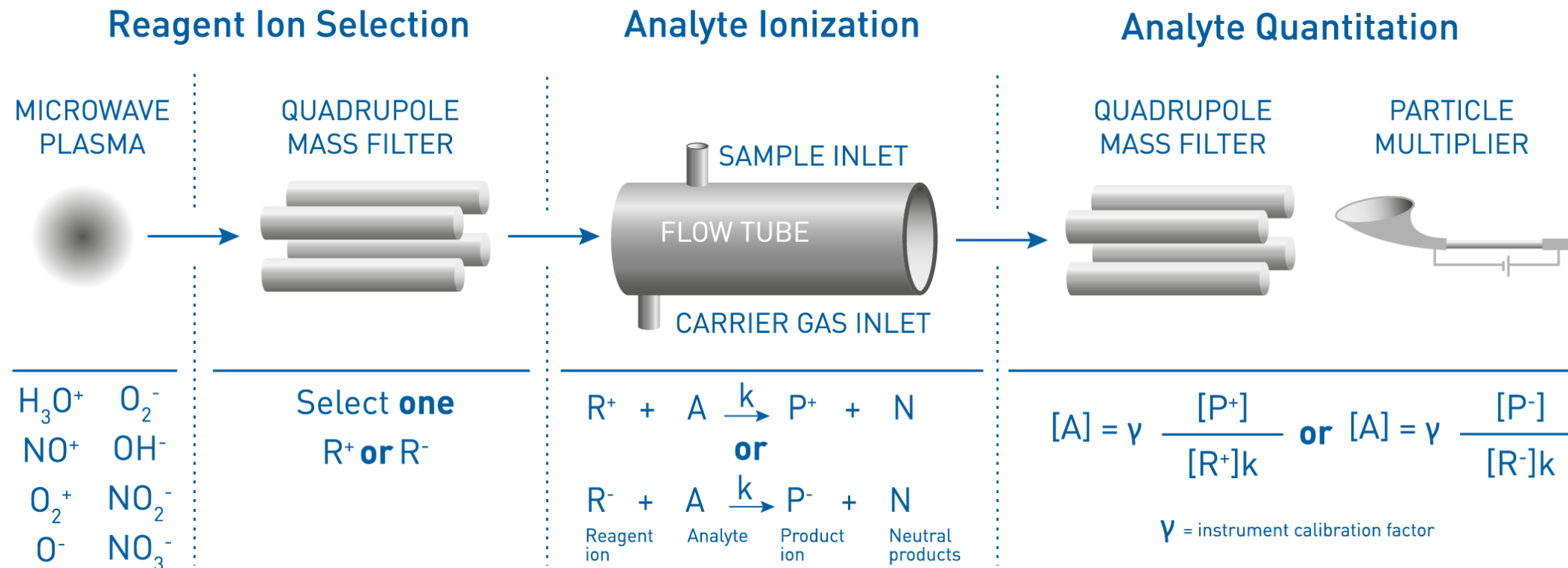
Selected Ion Flow Tube
– Mass Spectrometry

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SIFT-MS: How it works



MULTIPLE REAGENT IONS

PURE REAGENT ION DELIVERY

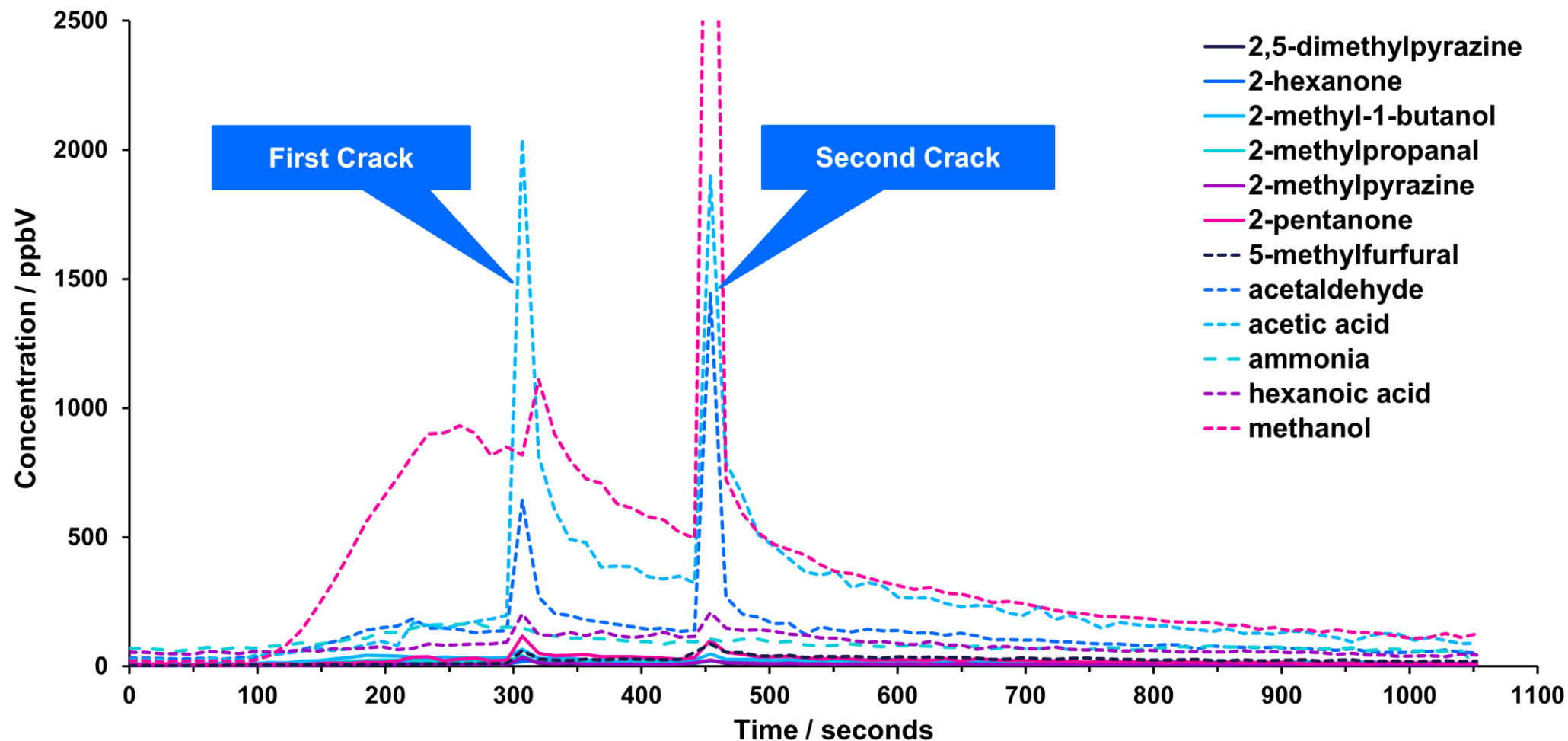
ULTRA-SOFT SAMPLE IONIZATION

MASS SPECTROMETER

SIFT-MS Ion Chemistry

| Mechanism | H ₃ O ⁺ | NO ⁺ | O ₂ ⁺ | OH ⁻ | O ⁻ | O ₂ ⁻ | NO ₂ ⁻ | NO ₃ ⁻ |
|------------------------|-------------------------------|-----------------|-----------------------------|-----------------|----------------|-----------------------------|------------------------------|------------------------------|
| Proton transfer (PT) | ✓ | ✗ | ✗ | | | | | |
| Electron transfer (ET) | ✗ | ✓ | ✓ | ✗ | ✗ | ✓ | ✗ | ✗ |
| Dissociative ET | ✗ | ✓ | ✓ | | | | | |
| Hydride abstraction | ✗ | ✓ | ✓ | | | | | |
| Association | ✓ | ✓ | ✗ | ✓ | ✓ | ✓ | ✗ | ✗ |
| Proton abstraction | | | | ✓ | ✓ | ✓ | ✓ | ✓ |
| Hydrogen atom transfer | | | | ✗ | ✓ | ✗ | ✗ | ✗ |
| Associative detachment | | | | ✓ | ✓ | ✓ | ✗ | ✗ |
| Displacement | | | | ✓ | ✓ | ✗ | ✗ | ✗ |
| Elimination | | | | ✓ | ✓ | ✗ | ✗ | ✗ |

Diverse functionalities in one real-time analysis





Case Study Ambient monitoring in New Zealand

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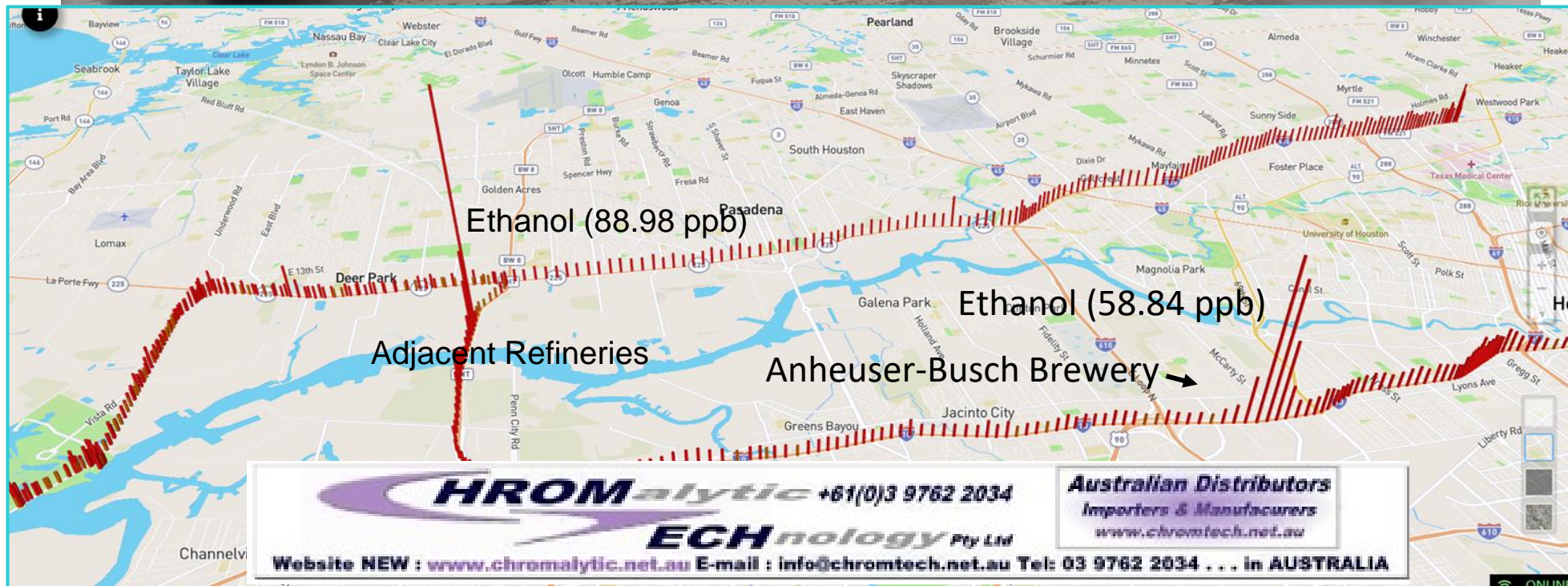
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Syft Tracer: Mobile Van Mounted

Syft products have been mounted in mobile van laboratories with our 3D mapping software for monitoring agencies to conduct air quality assessments across countries and around suspect facilities.

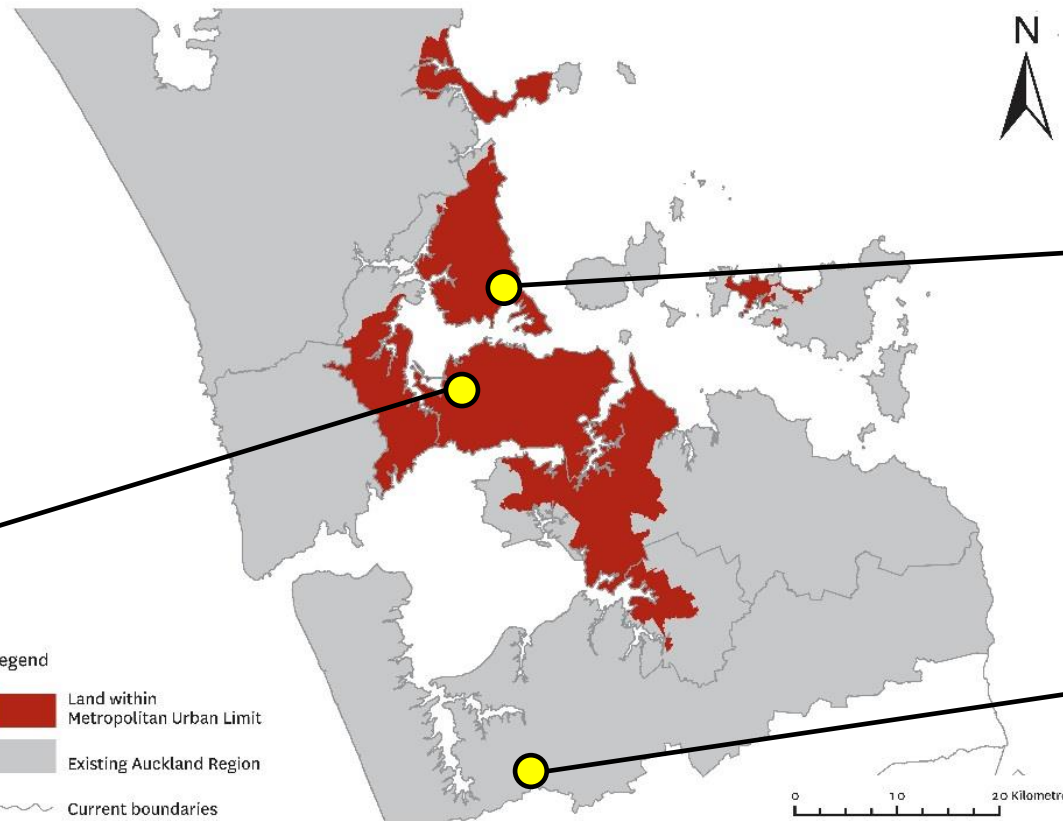
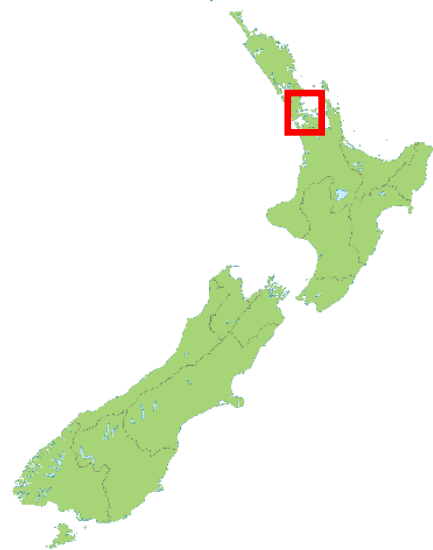


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Application of SIFT-MS to Air Quality Monitoring

Ambient monitoring campaign – Auckland, New Zealand



Freeway site

Suburban residential



Rural farmland

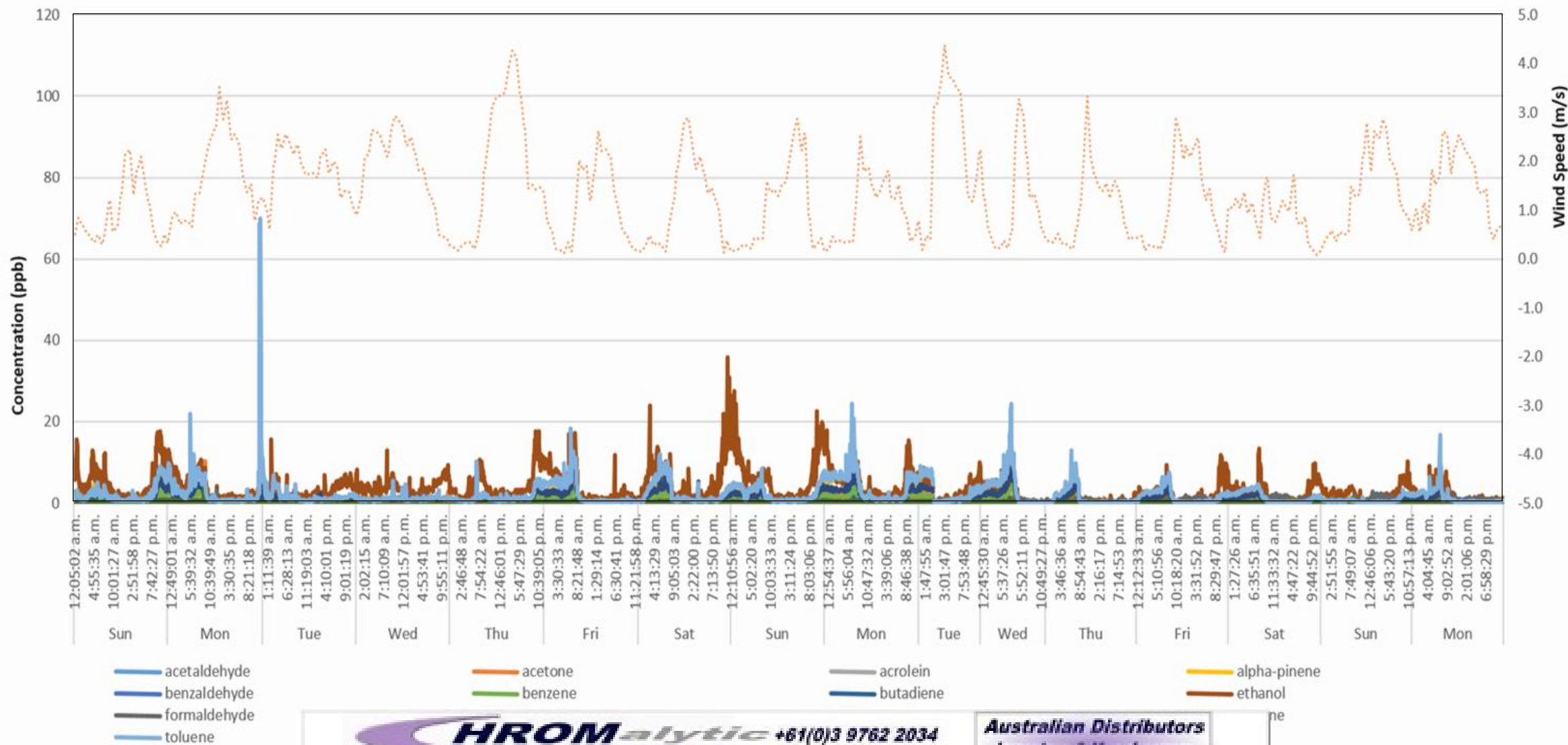


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Ambient monitoring in a residential area



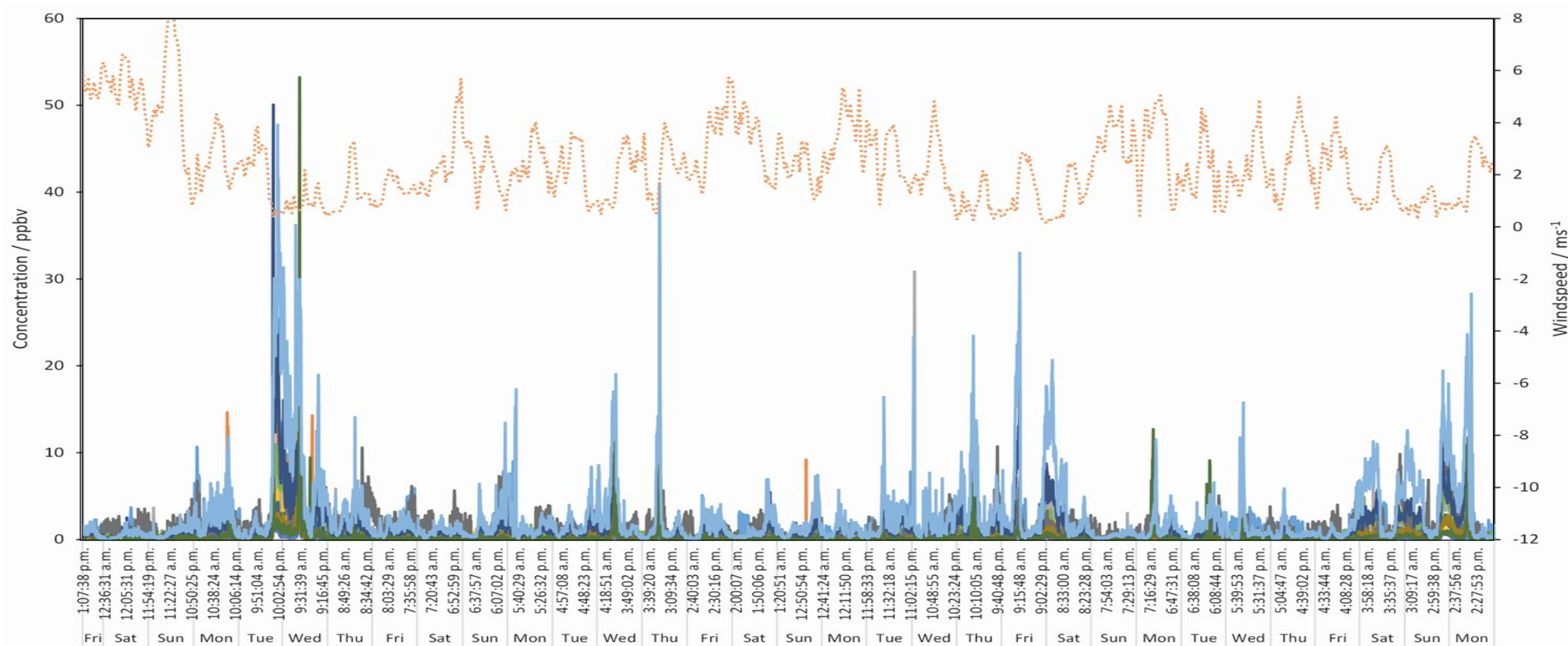
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Ambient monitoring near a freeway



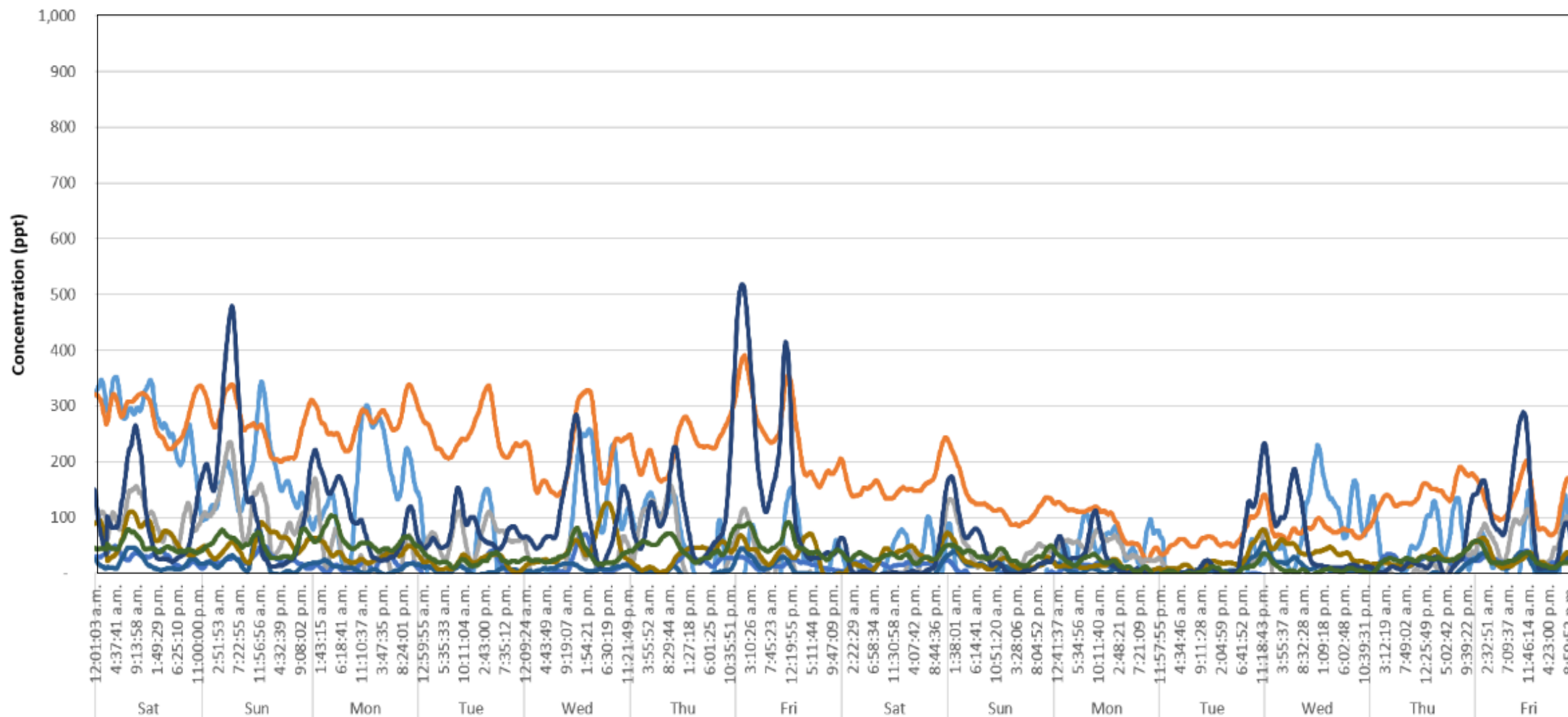
- acetaldehyde
- acetone
- acrolein
- alpha-pinene
- benzaldehyde
- benzene
- butadiene
- formaldehyde
- isoprene
- ethylbenzene + toluene
- styrene
- toluene
- Wind Sp

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Ambient monitoring at a clean air site





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Fenceline continuous emissions monitoring: oil production

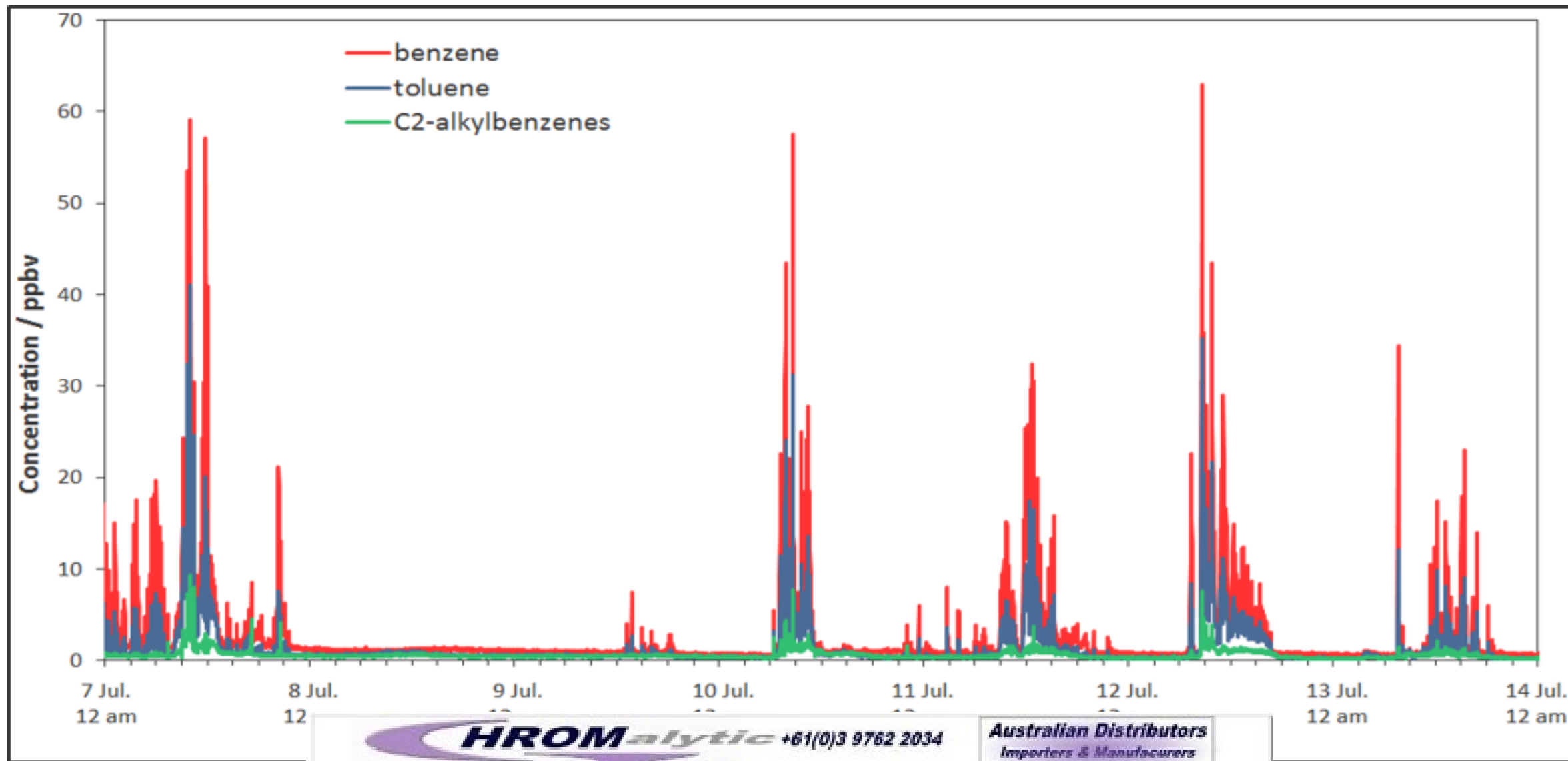
Taranaki
New Zealand



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Fenceline continuous emissions monitoring: oil production



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A scientist wearing a white lab coat, safety glasses, and a white face mask is working in a laboratory. They are using a white pipette to transfer liquid into a multi-well plate. The background shows a clean, professional lab environment with stainless steel surfaces and equipment.

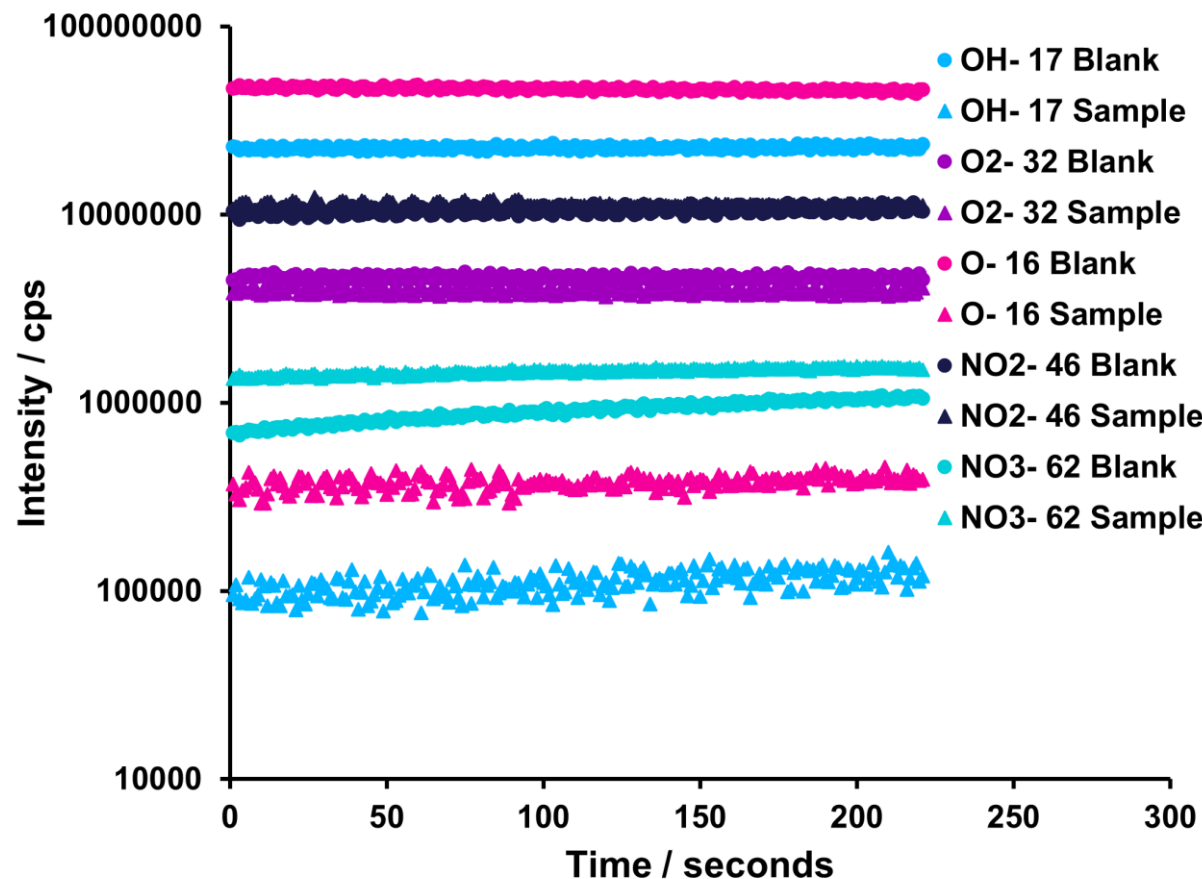
Case Study PFAS measurement in consumer goods

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PFAS Measurement in complex matrices

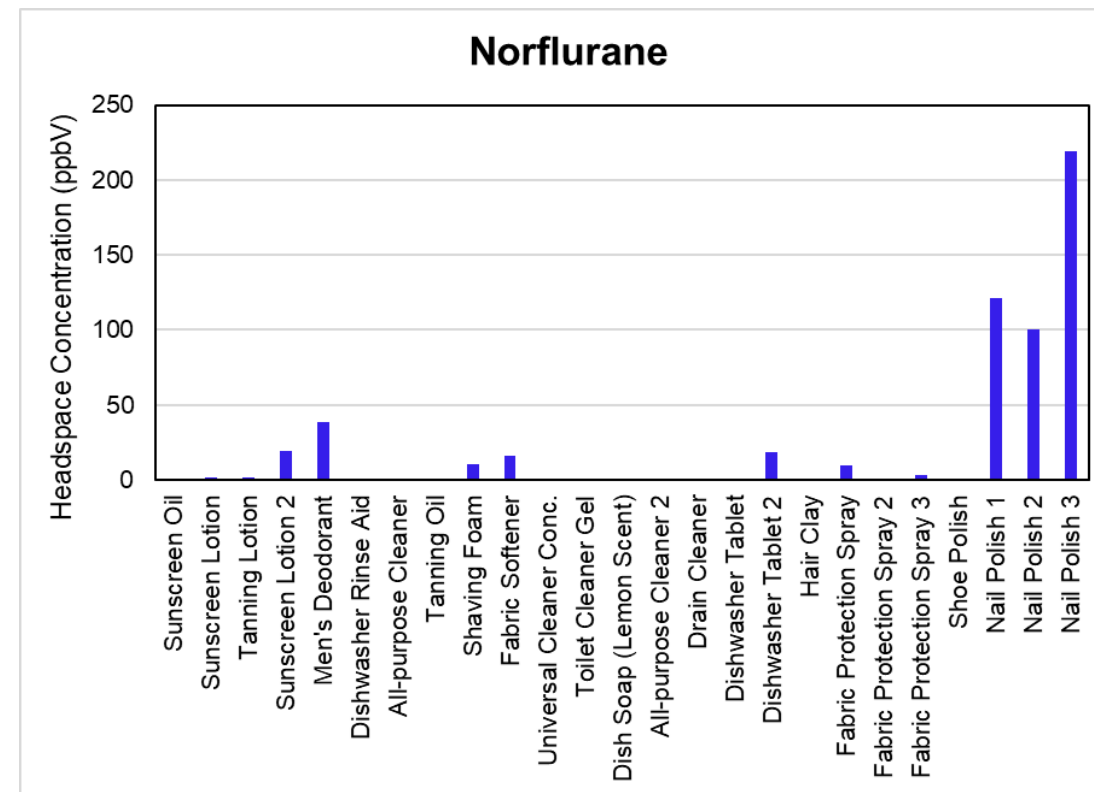
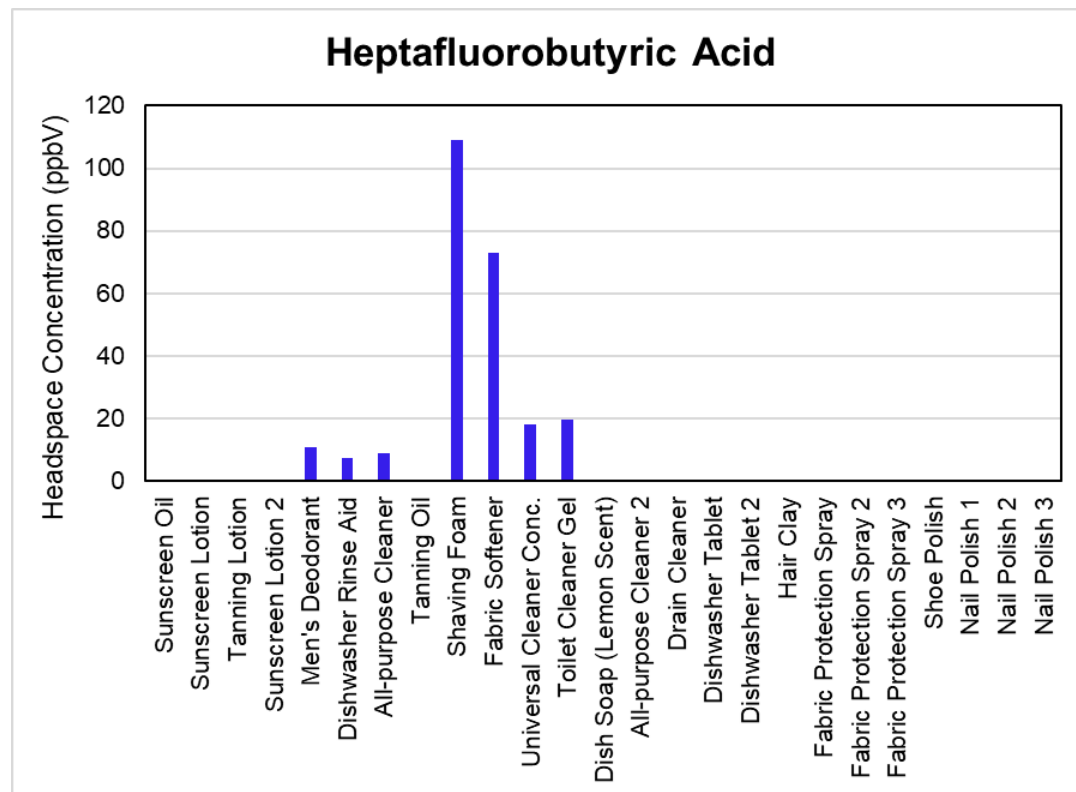


- PFAS can be measured with all reagent ions
- Several of these reagent ions prone to ion suppression effects in complex matrix conditions
- O_2^- , NO_2^- and NO_3^- do not react with common components in consumer products, yet measure PFAS well

Product ions used for quantification of PFAS

| Reagent ion | PFHA | HFBA | PFPA | NF |
|-------------|---|---|---|-------------------------------------|
| O_2^- | $C_6F_{11}O_2^-$ 0.83 m/z 313 $C_5F_{11}^-$ 0.17 m/z 269 | $C_4F_7O_2^-$ 0.88 m/z 213 $C_3F_7^-$ 0.12 m/z 169 | $C_3F_5O_2^-$ 0.96 m/z 163 $C_2F_5^-$ 0.04 m/z 119 | $C_2H_2F_4 \cdot O_2^-$ 1.0 m/z 134 |
| NO_2^- | $C_6F_{11}O_2^-$ 1.0 m/z 313 | $C_4F_7O_2^-$ 1.0 m/z 213 | $C_3F_5O_2^-$ 0.98 m/z 163 $C_2F_5^-$ 0.02 m/z 119 | |
| NO_3^- | $C_6F_{11}O_2^-$ 0.81 m/z 313 $C_6F_{11}O_2 \cdot NO_3^-$ 0.19 m/z 376 | $C_4F_7O_2^-$ 0.81 m/z 213 $C_4F_7O_2 \cdot NO_3^-$ 0.19 m/z 276 | $C_3F_5O_2^-$ 0.85 m/z 163 $C_3HF_5 \cdot NO_3^-$ 0.15 m/z 226 | |

PFAS in commercial products: HFBA and NF





Syft Tracer Pharm11

Compliant SIFT-MS
Solution for Pharmaceutical
Testing

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The Syft Tracer Pharm11 Bundle Solution

 First and only compliant **real-time** solution for direct mass spectrometry

➤ Make critical decisions faster

 A **complete solution** for volatile impurities analysis including:

➤ Syft Tracer – Next Gen SIFT-MS

➤ CTC autosampler

➤ SyftAuditTracer – 21CFR-11 compliant software

 One configuration for multiple, **diverse analyses**

➤ Nitrosamines, ethylene oxide, formaldehyde, and residual solvents

➤ Run diverse samples and methods back-to-back **without changeover**



The Syft Tracer Pharm11 Bundle Solution



High-throughput workflow automation

- Headspace automation enables > 200 samples / day
- Ability to **append** sequences to running batches
- **Stable** sample delivery across hundreds of daily injections



Syft Tracer differentiates **difficult analytes**

- Trace-level **sensitivity** to detect residual impurities
- Superior **selectivity** for multi-analyte targeting

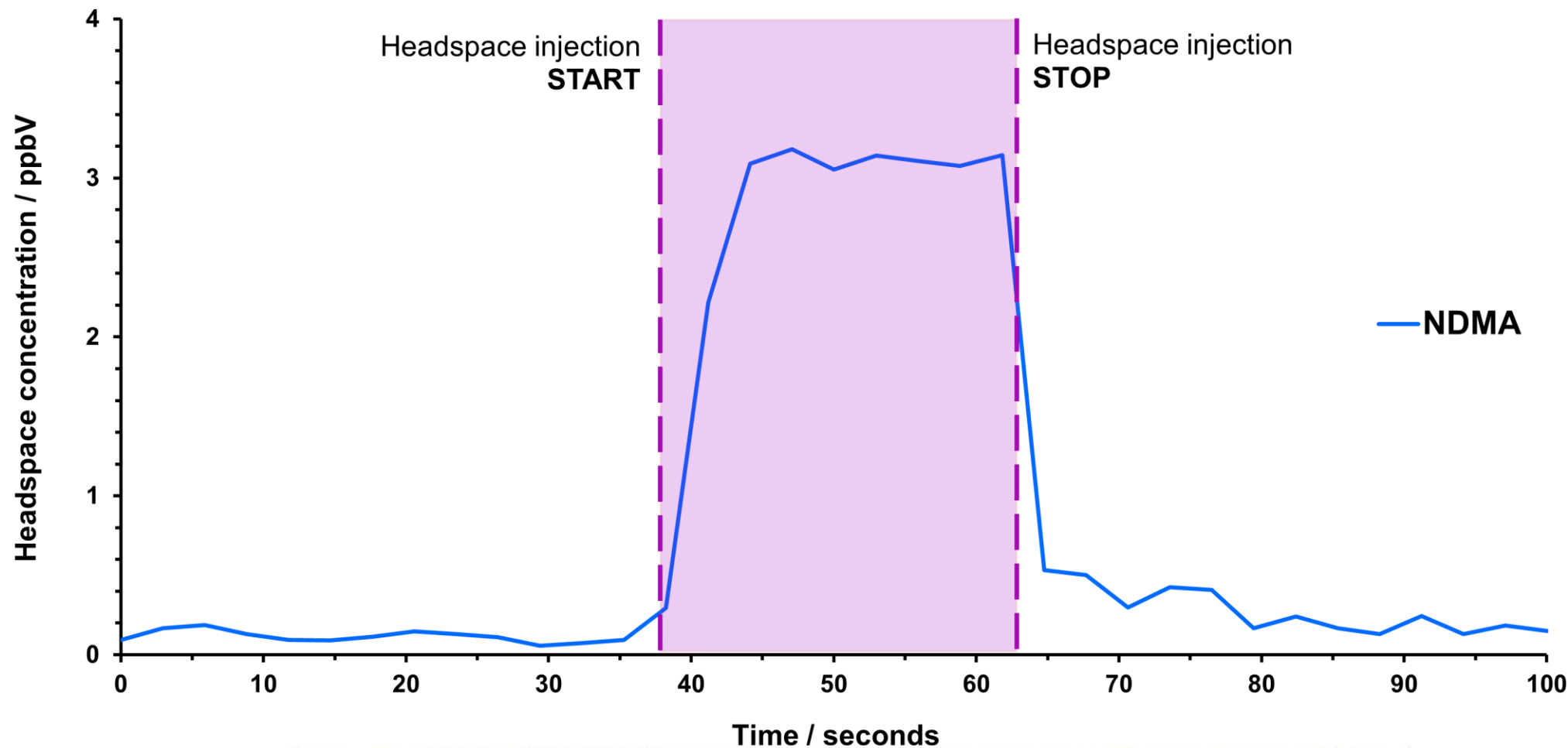


Simplicity of workflow

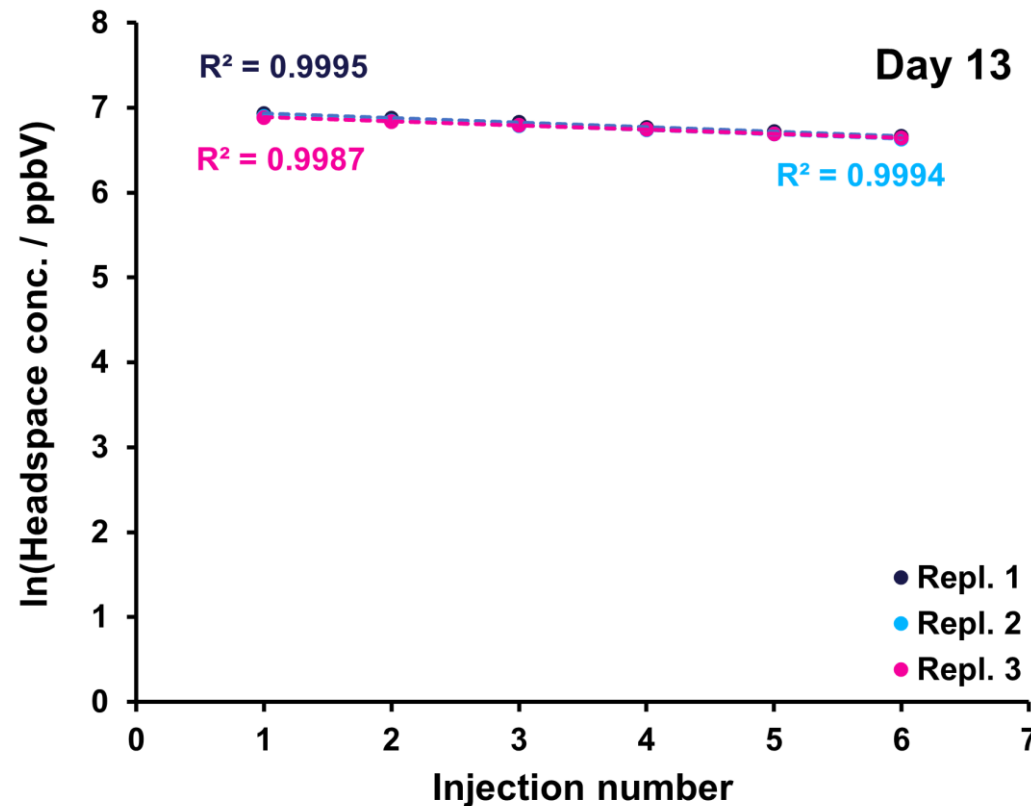
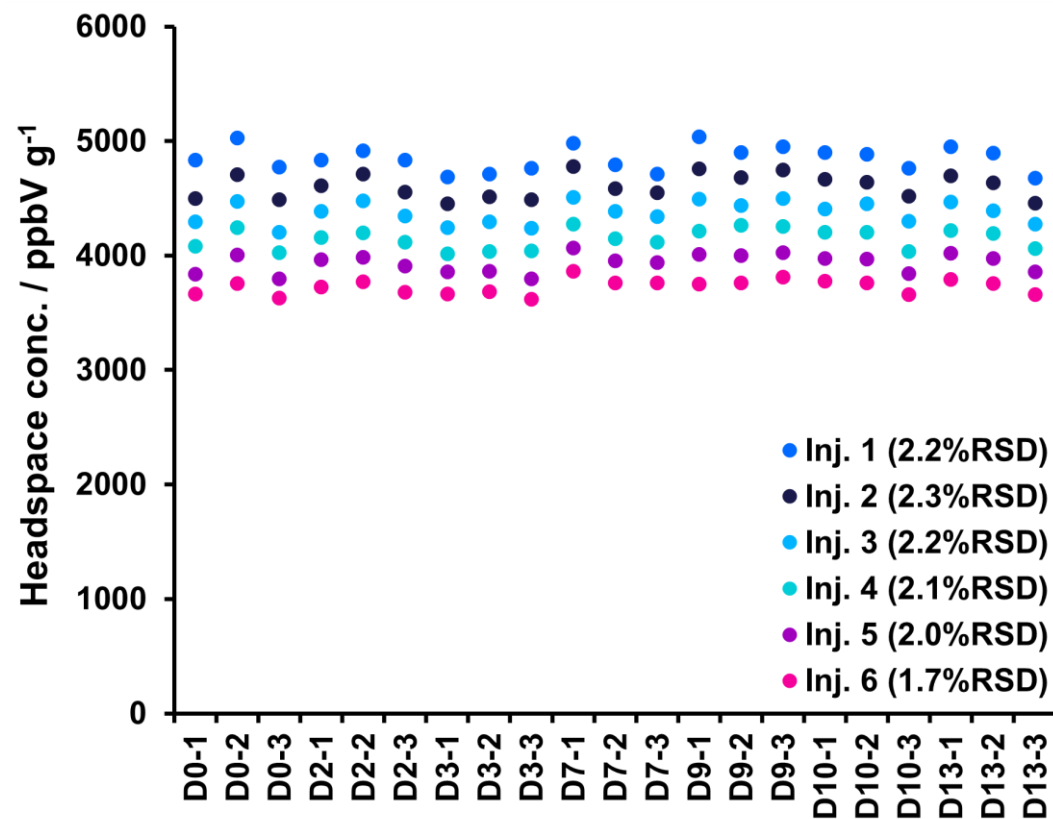
- No chromatography or pre-concentration required
- Walkup solution



Data in seconds, not minutes – at high sensitivity!

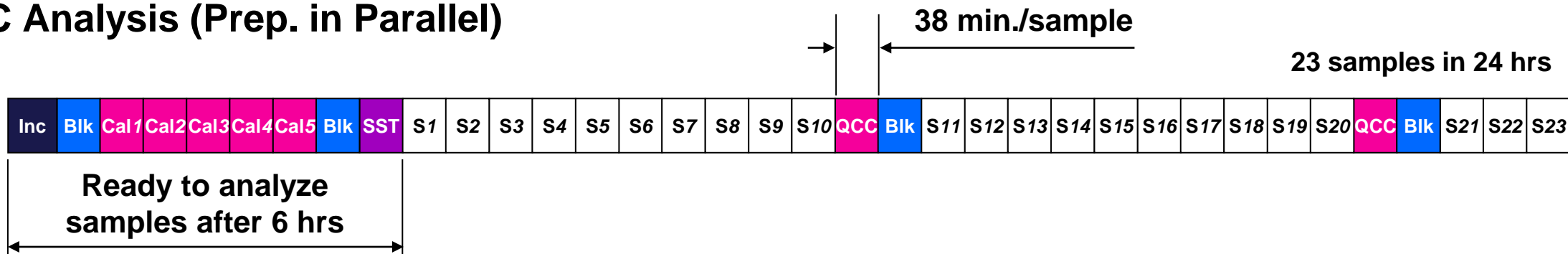


Stable and Reproducible: Durable calibration



Syft vs GC: 9-14x throughput + 4-11x faster to first result

GC Analysis (Prep. in Parallel)



Syft Tracer™: Revolutionary workflow + maximum productivity

Residual solvents

Ethylene oxide

Nitrosamines

Formaldehyde

Benzene

- 5 methods run seamlessly
- 36 + 15 + 5 + 4 + 10 samples in just 9.25 hrs
- *First result after 85 min.*

Prep












Legend:



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suitability test S Sample

SyftAuditTracer Compliant Software

-  Password protected login
-  Audit logs ensure full traceability
-  Records retained in non-editable format
-  Configurable user profile permissions
-  Import, build and manage methods
-  Walkup capable with the ability to append sequences to an existing run
-  Data processing
 -  Option for blank subtraction
 -  Calibration from curve or single point
-  CSV export option with data report
-  Digital signatures and PDF reporting

The screenshot displays the SyftAuditTracer software interface. The top window shows a login screen with fields for Username (murraym), Password (masked), and Analyzer IP (10.0.20.176), along with a Login button. A prominent overlay features the **FDA 21 CFR Part 11** logo. The bottom window shows a data review screen for 'Report_033_01 (Draft)' with a search for 'chloroform'. It includes a chromatogram plot with peaks at 4833.4 and 7540.9 minutes, and a 'Data Selection' table.

| Analysis Results | Points | Mean | RSD |
|---------------------------------|--------|---------|-------|
| SEQUENCE-3 | | | |
| SAMPLE-1111 | | | |
| CH(Cl-35)(Cl-37)-(85)Q2-/chloro | 6 | 5872.13 | 1.230 |
| SAMPLE-1112 | | | |
| CH(Cl-35)(Cl-37)-(85)Q2-/chloro | 6 | 4915.99 | 1.059 |
| SAMPLE-1113 | | | |
| CH(Cl-35)(Cl-37)-(85)Q2-/chloro | 6 | 5170.15 | 1.119 |
| SAMPLE-1114 | | | |
| CH(Cl-35)(Cl-37)-(85)Q2-/chloro | 6 | 5681.83 | 1.241 |
| SAMPLE-1115 | | | |
| CH(Cl-35)(Cl-37)-(85)Q2-/chloro | 6 | 4887.36 | 1.029 |

Summary

SIFT-MS

- Real-time, Rapid, Repeatable
- Reduced sample preparation
- Diverse matrices and volatiles
- High sensitivity
- Stable and reproducible
- Rugged system

Successful in

- Simplified analysis of challenging VOCs
- Real-time analysis for continuous manufacturing
- Environmental monitoring – stationary & mobile
- High throughput

Syft Tracer Pharm11

- Only compliant real-time solution for MS
- Automated high throughput analysis
- Walk-up capability



Thank you



Learn more: www.syft.com

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