# ULTRA-SENSITIVE SOLUTIONS FOR REAL-TIME TRACE GAS & AEROSOL ANALYSIS

# CORPORATE, PRODUCT & TECHNOLOGIES PORTFOLIO









### **WELCOME TO OUR WORLD**

We are pioneers and the world's leading company in Proton Transfer Reaction – Mass Spectrometry (PTR-MS), an extremely sensitive technology for monitoring volatile organic compounds (VOCs), invented by the founders of our company.

Our renowned PTR-MS trace gas analyzers have contributed to hundreds of high-impact publications and continuously enable new insights in various science domains. We also produce automated air monitoring systems for the semiconductor industry, environmental applications and illicit substances detection markets.

The modular "ioniTOF" time-of-flight mass spectrometers are a core component of our systems and are now also available for research & OEM clients. We have more than 20 years of experience in analytical instrument engineering that account for reliability, ultra-low detection limit, very high sensitivity, fast response time and robustness of our products. We manufacture air monitoring solutions at our head-quarters in Innsbruck, Austria. In our demo lab we offer analyses of samples to customers from all over the world.

Get in touch and we'll solve your analytical challenge!

# QUICK COMPANY FACTS:



Success story since 1998



400+ PTR-MS instruments sold



100+ ioniTOF produced



40+ international experts









### **WELCOME TO OUR PRODUCTS**



## HIGH-END SCIENTIFIC INSTRUMENTATION

Extremely Sensitive Real-Time Analyzers

Our Proton Transfer Reaction – Mass Spectrometers are considered the "gold standard" for real-time organic trace gas analysis. Invented by our company's founders, PTR-MS is nowadays available in various innovative configurations based on our ioniTOF time-of-flight mass spectrometers. Given our expertise in ion chemistry for more than two decades, we consider it our mission to provide scientific instrumentation for well-reproducible measurement results and the highest possible level of quantification accuracy. Being robust, fast, accurate and extremely sensitive we satisfy the highest demands of the world's best scientists.



### **TOF-MS FOR RESEARCH AND OEM**

Time-of-Flight Mass Spectrometers - ioniTOF Platform

Benefit from our unique modular TOF-MS systems! We develop our ioniTOF platform as a multi-stage system offering entry-level, mid and high-resolution analyzers based on the same peripheral components, purpose-built for your experimental set-up. A unique feature of the continuously evolving ioniTOF is its modular design that allows a flexible choice of performance configuration and front-end, such as different mass resolving powers, hexapole ion-guides, positive/negative polarity, APi-TOF etc. Get the analyzer you need for your project with the assistance of our R&D experts.



### **AIR MONITORING SOLUTIONS**

Reliable Continuous Process Monitoring

Our automated direct trace gas analysis solutions are trusted by many industrial customers from all over the world. Based on our real-time analyzers equipped with integrated calibration and multiplexing systems for covering various sampling points in factories or semiconductor fabs, we conceive fully automated air monitors supplying crucial data for process engineers and executives. The core of all our industrial solutions is the Automated Measurement and Evaluation (AME) framework for monitoring, identifying, quantifying and displaying complex sets of substances in a user-friendly interface. We collaborate with renowned system integrators as OEM and are a reliable partner for industry certified (e.g. SEMI S2) products.



# ANALYTICAL SERVICES

Applications Demo Lab and Contract Research

Let us demonstrate the unique capabilities of our instruments during a showcase tailored to your specific application. If you face more complex analytical challenges we offer various forms of analytical services. You don't want to invest in a scientific instrument or lack the manpower? You want to get data on your samples before investing in a PTR-MS instrument? Let us analyze your samples in our lab. We will implement a study design, adapted to your needs. After the experiments we will help in the interpretation of data and create reports for you. Happy with what you receive from us? Let us continue with services, or benefit from our flexible try & buy options.

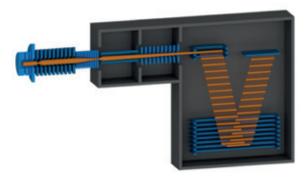






### **WELCOME TO PTR-MS**

# ION SOURCE | REACTION REGION | ION-BOOSTER ION-GUIDE | TRANSFER LENSES | TOF-MS



IONICON TRU-E/N® PTR-TOFMS schematic incl. ION-BOOSTER funnel and Hexapole ION-GUIDE

 ${\rm H_3O^+}$  is generated in the IONICON ULTRA-PURE ion source. In the downstream PTR drift tube, these  ${\rm H_3O^+}$  reagent ions efficiently ionize the traces of Volatile Organic Compounds (VOC) in the sample at precisely-defined reaction conditions. This quantitative ionization process is soft and conserves the chemical composition of the molecules. After the extremely efficient PTR ionization process, ions are separated according to their m/z and detected in a high-resolution TOF mass analyzer in real-time.

# **OUR TECHNOLOGY OFFERS A MULTITUDE OF ADVANTAGES:**



very efficient and quantitative



Limit of Detection < 1 pptv



very soft - and adjustable fragmentation



no sample preparation required









### **OUR QUALITY PROMISE**

1

## **ULTRA-PURE IONIZATION**

Our ultra-pure ionization technique combines the production of clean reagent ions with IONICON's homogeneous and fully controllable ion-molecule reaction chamber. Therefore, only IONICON PTR-MS instruments allow for measuring complex mixtures of VOCs without significant artifacts.

3

### **REAL-TIME RESPONSE**

As the "gold standard" for real-time response, the IONICON PTR-MS technology offers sub-second response times of most volatile organic compounds (VOC) and with the optional Extended Volatility Range (EVR) technology also of the IVOC range. IONICON's exclusive CHARON® particle inlet even extends the real-time response to condensed SVOCs and LVOCs.

2

## **SOFT ION-EXTRACTION**

Unlike many CIMS technologies, which operate at undefined reaction conditions, we rely on our patented TRU-E/N® technology (EP3309817B1, US10074531B2), which offers well-defined ion chemistry that can be adjusted over a wide range. This promise also holds true when our performance enhancing ION-BOOSTER and Hexapole ION-GUIDE technologies are installed, which are designed for soft and pristine ion extraction.

4

## **QUANTITATIVE RESULTS**

IONICON-grade PTR-MS offer a predictable instrumental response. Combined with our ultra-pure ionization and soft ion-extraction, we can therefore quantify uncalibrated VOCs simply based on reaction rate constants.

# SRI-MS

Selective Reagent Ionization - Mass Spectrometry

IONICON's PTR-MS instruments equipped with SRI capability offer a variety of reagent ions. With NO $^+$ ,  $O_2^{\phantom{2}+}$ , NH $_4^{\phantom{4}+}$ , Kr $^+$  and Xe $^+$  the ideal reagent ion for virtually every field of application can be selected. Moreover, all reagent ions are produced at excellent purity levels. The implementation of some reagent ions is protected by international patents (e.g. EP2606505B1, US9188564B2) and thus exclusively available from IONICON.







### **OUR MISSION IS YOU**

With over 20 years of experience in the development of analytical instruments, leading to award-winning technological breakthroughs and numerous international patents, we are proud to be denoted the world's leading PTR-MS company. IONICON PTR-MS has become the benchmark method for simultaneous direct monitoring of VOCs in ambient air with a wide range of applications. Hundreds of leading scientists, institutions and multinational corporations are benefiting from our solutions.

With more than 400 instruments sold since the invention of PTR-MS, our world class customer support and growing team of experts make us a trusted and appreciated partner of our customers. The IONICON sales & analytical services team is looking forward to working with you.

Get in touch and we'll solve your analytical challenge!

# **OUR CLIENTS:**























PFEIFFER VACUUM











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