CHARON

> All-in-one:

Direct Aerosol & Gas-Phase Monitoring

CHARON PARTICLE INLET-SYSTEM

The new CHemical Analysis of aeRosol ON-line (CHARON) particle inlet coupled to IONICON PTR-TOFMS series instruments quantitatively detects organic sub-µm particulate matter as well as particulate ammonium and nitrate at single digit ng/m³ mass concentration levels in real-time.

This revolutionary new inlet enables PTR-TOF to measure aerosols directly with the most versatile, reliable and proven technology for VOCs analysis available in the market: PTR-MS. One single instrument covers VOCs and allows additionally the molecular-level characterization of sub-µm particulate organic matter in real-time.

MAJOR REASONS FOR CHARON

▶ On-line and real-time characterization of non-refractory organic sub-µm particulate matter
▶ Low limits of detection allow for laboratory-based and ambient measurements
▶ Detects the majority of atmospheric organic carbon with a single instrument
▶ An exclusive add-on to selected IONICON PTR-TOFMS series instruments

PTR-TOFMS SERIES

> One instrument for aerosols and gas
> VOC, IVOC, SVOC and LVOC
> Large linearity range
> High temporal resolution

Find out more:
www.ionicon.com/charon

IONICON

CHARON PTR-TOFMS
ALL-IN-ONE FOR GAS-PHASE & AEROSOLS

CHARON PTR-TOFMS is a designated on-line and real-time particle analyzer.

In addition, the CHARON particle inlet significantly extends the range of compounds that can be detected using PTR-MS from gas-phase volatile and intermediate volatile organics (VOC and IVOC) to particle-phase intermediate, semi and low volatile organic compounds (IVOC, SVOC and LVOC). Therefore, the PTR-MS technology allows for the detection of almost the full range of atmospheric organic carbon with a single IONICON PTR-TOF instrument.

With its high temporal resolution and the high degree of conserved chemical composition information, CHARON PTR-TOFMS is thus the perfect analytical technique to identify and quantitatively follow atmospheric particulate tracer compounds like levoglucosan and polycyclic aromatic hydrocarbons. One-minute resolved data of hundreds of identified chemical compositions boost the quality of source apportionment (e.g. by positive matrix factorization; PMF) to an unseen level.

TECHNICAL DETAILS & BENEFITS

The CHARON particle inlet consists of a honeycomb activated charcoal denuder that efficiently adsorbs organic gases and transmits particles, a high-pressure aerodynamic lens system that collimates and extracts sub-µm particles, and a thermo-desorber that evaporates non-refractory organic particulate matter at moderate temperatures of 100-160°C and reduced pressures of a few mbar.

These organics are subsequently analyzed as gas-phase analytes with an IONICON high-resolution PTR-TOFMS instrument. By coupling the CHARON inlet to a PTR-TOF, the VOC inlet remains fully operational. An automated valve system allows for scheduled switching between gas- and particle-phase measurements as well as zeroing of the particle inlet.

AVAILABLE FOR IONICON PTR-TOF SERIES

The CHARON particle inlet is available as an exclusive add-on for selected IONICON PTR-TOFMS series instruments. Sensitivities and limits of detection depend on the performance of the applied instrument. IONICON engineers conceived CHARON as an upgrade for existing systems or optional add-on for new instruments.

■ Learn more:
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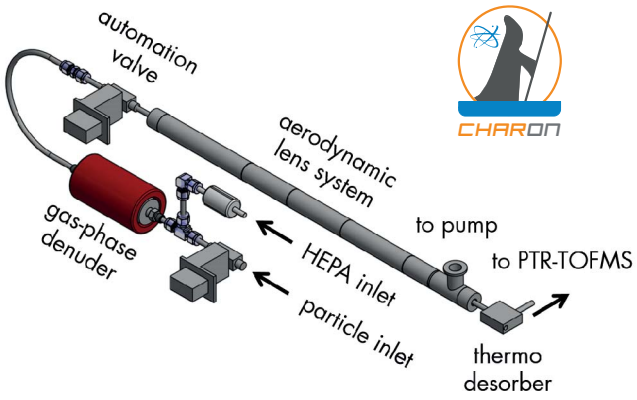

Fig. 1: Typical CHARON PTR-TOF set-up. First organic gases are adsorbed by a denuder, then the particles enter a high-pressure aerodynamic lens system that collimates and extracts particles, and finally a thermo-desorber evaporates non-refractory organic particulate matter before the gas-phase species are analyzed with an IONICON PTR-TOFMS.

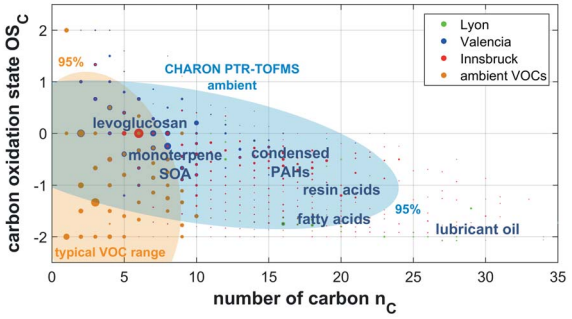

Fig. 2: CHARON significantly extends the range of measurable compounds from gas-phase volatile and intermediate volatile organics (VOC and IVOC) to particle-phase intermediate, semi and low volatile organic compounds (IVOC, SVOC and LVOC).

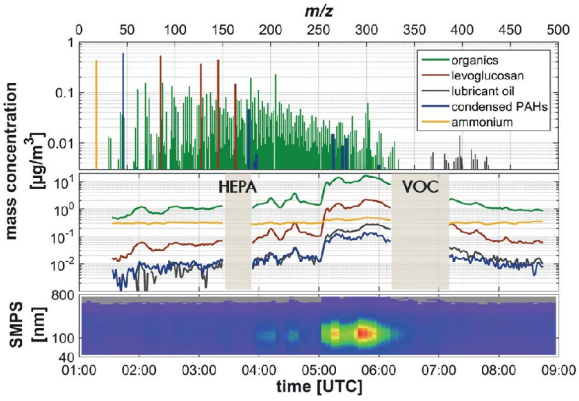

Fig. 3: A morning hour urban air-pollution event was measured in April 2017 in Innsbruck, Austria. Cold temperatures and a strong inversion led to a quick accumulation of primary particulate matter emitted from traffic and domestic heating. Good temporal agreements with in parallel Scanning Mobility Particle Sizer (SMPS) measurements are achieved.

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