

mipTOF

Field Deployable Real-Time Analysis of Trace Elements and Metals in Air



Trace elements in air.
Real-time, anywhere.



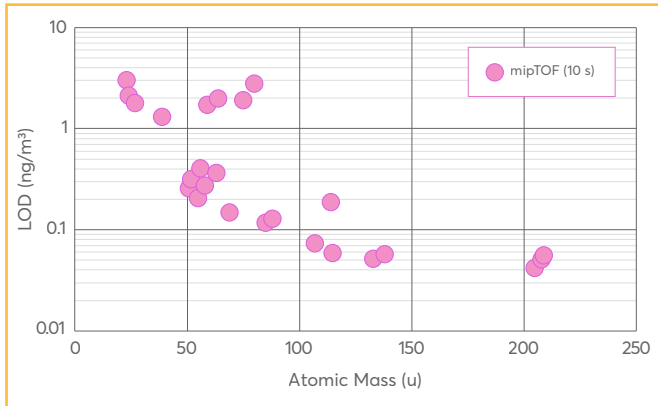
Features

- **High-Power Plasma Source.** Microwave-sustained inductively coupled atmospheric plasma (MICAP, RADOM Instruments), operable with N₂ gas or air
- **Field Deployable.** On-site gas generation eliminates the need for gas cylinders
- **Real-Time Sampling.** Direct, real-time air sampling for continuous particulate analysis
- **Maximum Sensitivity.** Detection of elements in individual particles at atto- to femtogram detection limits

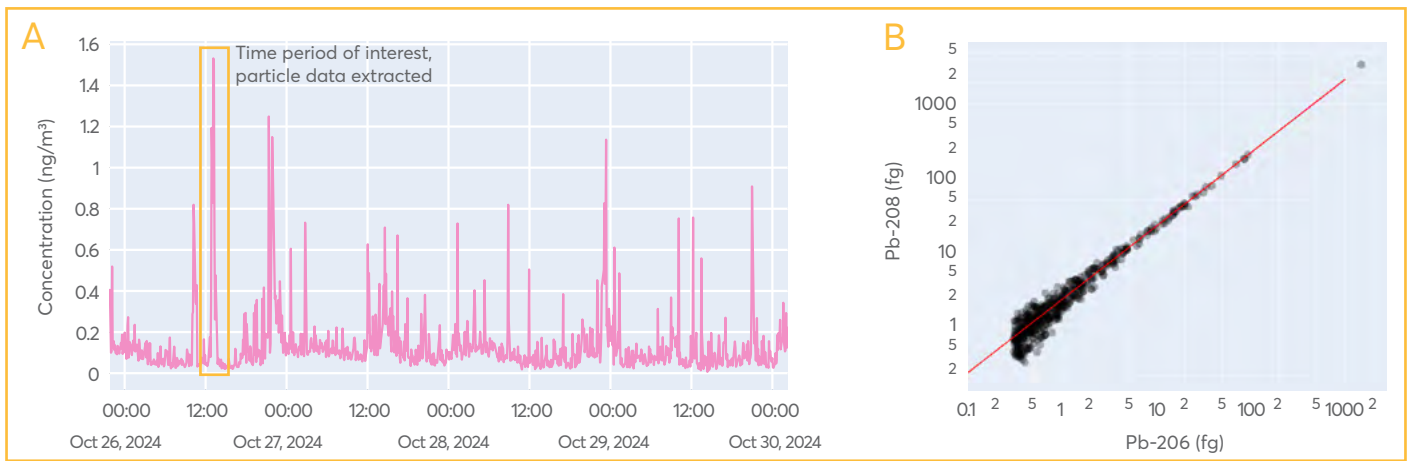
Applications

- Trace elements in air
- Ultrafine particle detection: PM_{0.1}, PM_{2.5} and PM₁₀
- Per particle element- and isotope ratio
- Source apportionment
- Mobile air monitoring

Metal Detection in Individual Aerosol Particles



The limits of detection and the time resolution of the mipTOF allow for metal detection in individual aerosol particles. The detection power for 10 seconds integration time is better than of state-of-the-art XRF based instruments in 30 minutes.



(A) Pb data from 4 days of continuous measurement, integrated into 5-minute time intervals. (B) Isotope correlation of ^{206}Pb and ^{208}Pb evaluated from individual particles detected during a specific 15 minutes period at day 1 of the campaign. The ratios found in the particles correspond to the natural abundance of the two isotopes. The scatter depends on the element mass per particle and follows Poisson statistics.

Specifications

Parameter (unit)	Specified Values
Mass Resolving Power, $M/\Delta M$ at FWHM	3,000
Sensitivity (cps/ μgL^{-1}) *	^{59}Co : >250 ^{115}In : >2,500 ^{238}U : >10,000
Oxide Formation Rate, CeO^+/Ce^+ (%) *	<5
Doubly Charged Ions, $^{137}\text{Ba}^{++}/^{137}\text{Ba}^+$ (%) *	<1
Background at m/Q 220 (cps) *	<2
Power Requirements (kW)	Active: 5.5, Standby: <0.35
Dimensions, L x W x H (m) Weight (kg)	0.8 x 1.3 x 1.0 195

*Using liquid sample introduction with nebulizer and spray chamber and no-gas mode in collision cell.