

Bruker solariX XR 12T

Ultra-high resolution Fourier transform ion cyclotron mass spectrometer

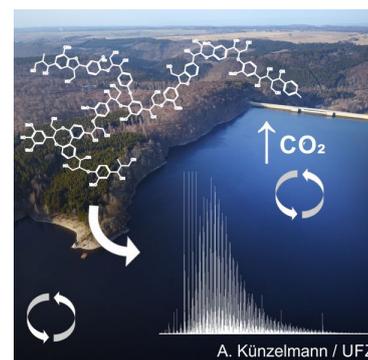
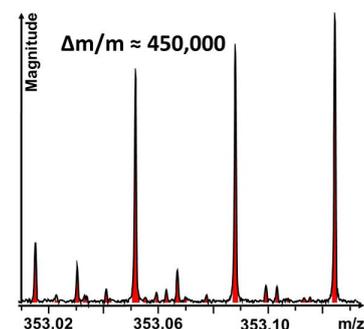
Instrument Description:

The Bruker Daltonics solariX XR 12T Fourier transform ion cyclotron resonance mass spectrometer is equipped with a next generation dynamically harmonized analyzer cell. It offers unrivalled resolution for the identification of molecules in highly complex mixtures in the mass range 200 – 2000 m/z (for single charged ions). The combination of mass accuracy (< 100 ppb) and mass resolution (> 1,000,000 at m/z 400) enables detection and molecular formula assignments of molecules that differ in their mass by just the mass of an electron. Different ionization techniques are available, for example positive and negative electrospray (ESI+/-), atmospheric pressure photoionization (APPI), atmospheric pressure chemical ionization (APCI) or even (matrix assisted) laser desorption ionization (MALDI/LDI, 1 kHz Smartbeam-II laser with spatial resolution down to 20 μm) for mass spectral imaging (MSI). Fragmentation studies of single masses can be realized via collision induced dissociation (CID) and electron capture/transfer dissociation (ECD, ETD).



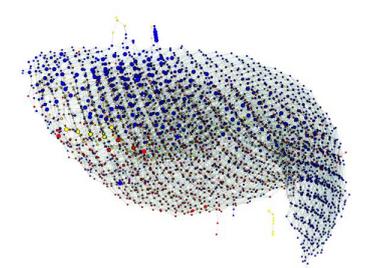
Application Examples:

- natural organic matter/complex mixtures:
 - dissolved organic matter in freshwater systems
 - dissolved and particulate organic matter in soils and aerosols
 - photolysis and ozonolysis products in waste- and drinking water treatments
 - bound residues from organic pollutant degradation in soils and aquatic organic matter
- metabolomics/proteomics:
 - transformation products of anthropogenic chemicals and pharmaceuticals
 - secondary metabolites in culture media (exometabolites) and cell extracts
 - top-down analysis of proteins up to 100 kDa
- mass spectrometry imaging:
 - distribution of lipids and other small/medium molecule biomarker in tissues
 - analysis of TLC fractions of petroleum or natural organic matter samples



Requirements for Samples:

Depending on the application, samples should be in dissolved phase, typically methanol or acetonitrile and in particular free of salts and buffer solutions. The carbon concentration in the solution should be $\approx 2 \frac{\text{mmolC}}{\text{L}}$ (or $\approx 20 \frac{\text{mgC}}{\text{L}}$) and the final sample volume should be in between 0.1 mL and 0.5 mL. MALDI images can be acquired from cryo-sectioned native tissue (10 to 20 μm), optional with a Bruker Autoflex speed LRF MALDI-TOF (2 kHz) for faster data acquisition. Contact us for specialized applications such as isotope labelling studies, fragmentation experiments or hyphenation with liquid chromatography (e.g. nanoLC).



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Picture captions (from top):

- 12T magnet and SolariX XR cart
- ultra-high resolution (mDa scale)
- Rappbode dam (Saxony-Anhalt)
- molecular compositional network
- MALDI masses in rat cerebellum

