BE PREPARED FOR FUTURE THREATS

Bruker Mobile Mass Spectrometer

Detection and Identification of all threat relevant Novichoks

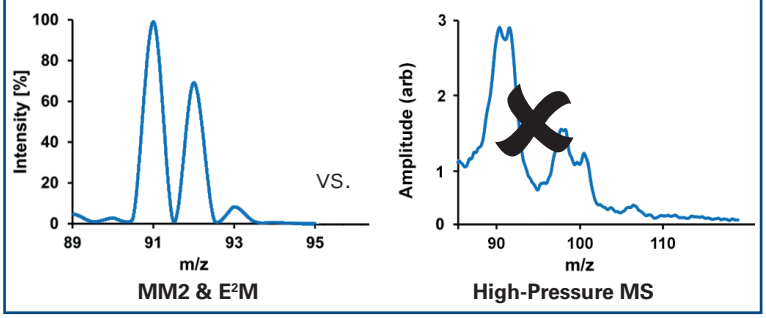
Innovation with Integrity

In 2019 the OPCW (Organisation for the Probition of Chemical Weapons) amended the Annex on Chemicals Schedule 1 by adding a new class of nerve agents called Novichoks also known as fourth generation agents (FGAs).

Due to their unique sample analysis and identification capabilities Bruker´s latest iteration of mobile mass spectrometer could be expanded now to detect besides the well-known A-230, A-232 and A-234 all threat relevant Novichoks comprised in Pos. (13), (14) and (15) of OPCW schedule 1 list.

What is required for Analysis?

- E²M or MM2, software upgrade for existing MS is possible
- Resolution better than 1 Da



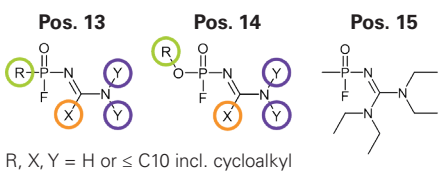
MM2 & E²M | High-Pressure MS

What is new?

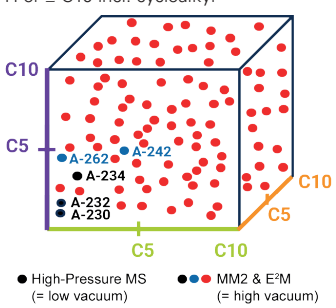
- New library and spectra data for all threat relevant Novichoks
- New methods for direct measurement via air/surface probe and GC/MS
- Analysis of swabs

How many Novichoks are defined by the OPCW?

- According to OPCW schedule 1 list
  ≥ 3000 Novichoks possible



R, X, Y = H or ≤ C10 incl. cycloalkyl



Tackle all CWAs and TICs: Bruker´s GC/MS Solution for LVOCs

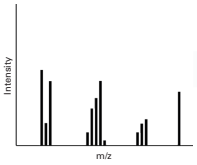
-20°C (-4°F)

49°C (120°F)

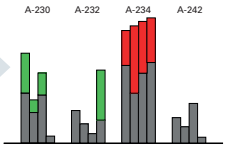
(A) Selected Ion Monitoring (Response Time approx. 60 s)

Direct

MM2 - Air/Surface Probe



Mass Spectrum



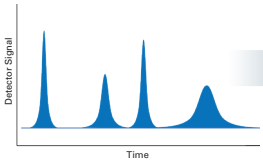
Selected Ion Monitoring

(B) Full GC Analysis (Analysis Time 10-15 min)

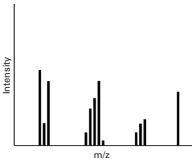
Complex

Air/Surface Probe + Surface Sampler

MM2 + GC Probe



GC Separation



Mass Spectrum

Normally, detecting Novichok agents presents a unique challenge due to their low vapor pressure and high boiling points, making gas-phase detection extremely difficult. Analyzing real-world, complex samples and covering all threat relevant Novichok agents is now easily possible with the standard E²M/MM2 system.

For direct and fast target analysis (A) the heated probe head is pressed onto a surface (or swab) for the vaporization of chemicals. Predefined methods verify the presence of A-230, A-232, A-234 and other Novichok derivates, CWAs or TICs within minutes.

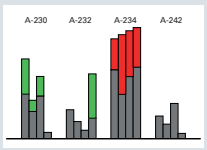
For **very low concentrations** or **complex chemical mixtures** (B), the surface sampler can be equipped with the air/surface probe to trap chemicals on a sampling tube. Through thermal desorption the enriched chemicals can be released in the GC probe and separated by their different chemical properties using predefined methods. Full mass spectra are recorded in the E²M/MM2. These fingerprints are used for clear identification through automated comparison with library spectra.

Take Advantage of the unique E²M/MM2 Setup

Air/Surface Probe

Heatable up to 220°C

Fast Target Analysis

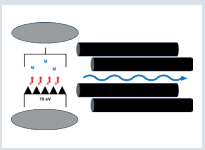


ID within seconds

Full GC Analysis

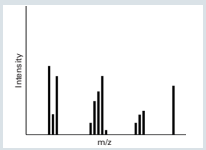
Analyze complex mixtures

70 eV EI Ionization



Fully NIST compatible

Unit Resolution



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Bruker Optics is ISO 9001, ISO 13485, ISO 14001 and ISO 50001 certified.

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