# Soft ionization GC coupling to LC-MS systems



Combine the best of both worlds – all advantages from GC and LC-MS in an integrated solution



### A powerful combination instead of separate solutions

GC-MS is the method of choice for many challenges in routine analysis. However, most samples require GC-MS as well as LC-MS analyses to cover the broad range of suspected target substances.

For both analyses dedicated instrumentation is required, which causes higher costs for acquisition, maintenance, and consumables.

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Here, the SICRIT<sup>®</sup> solution offers a cost-effective alternative, enabling GC analyses on any LC-MS instrument.

With its high sensitivity and soft ionization the SICRIT<sup>®</sup> Ion Source expands your mass spectrometric view and combines all advantages from GC and LC-MS in one integrated solution.

GC-SICRIT<sup>®</sup> coupling to the LCMS-9030 Q-TOF for non-target screening workflows and identification of unknowns based on accurate mass measurements.



## Enabling a unique range of applications

Separation and soft ionization of n-Alkanes for determination of molecular weights.



Soft ionization of PCBs forms [M]<sup>+</sup> ions to identify and validate components based on their isotopic pattern.



Sensitive quantification of Nitrosamines by GC-SICRIT<sup>®</sup>-MS based on individual LC-MS MRM transitions.

Compound	Abbreviation	LOD [ng/mL]
N-Nitrosodimethylamine	NDMA	1.2
Diethylnitrosoamine	NDEA	0.1
N-Nitroso-N- methylethylamine	NMEA	0.1
N-Nitrosodipropylamine	NDPA	0.4
N-Nitrosopyrrolidine	NDBA	0.1
1-Nitrosopyrrolidine	NPYR	0.4
1-Nitrosopiperidine	NPIP	0.5

#### #Alkanes



#### #PCBs



#### #Nitrosamines



#### More information on our website

Want to see more details and additional applications? Visit **www.plasmion.com** 

### A solution based on superior technology (SICRIT®)

#### Increased sensitivity



The locally confined ionization in a small capillary in extension of the MS-inlet avoids the loss of ions by coulombic repulsion and increases sensitivity.

#### No fragmentation



The unique shape of the cold plasma enables a soft ionization of analytes and avoids fragmentation.

#### Fragmented spectrum of El ionization\*

Spectrum of SICRIT<sup>®</sup> – almost no fragmentation



\*NIST Chemistry Webbook: https/webbook.nist.gov/chemistry

#### Enhanced range of analytes



Three simultaneous ionization mechanisms expand the range of detectable analytes, covering polar and non-polar components.



#### **Flexible coupling**

The gas-tight flow-through design enables a seamless coupling of any GC and GCxGC system with all LC-MS systems available on the market.



- SICRIT<sup>®</sup> covers the complete ionization range of APCI while causing less fragmentation.
- SICRIT<sup>®</sup> is capable to cover almost the whole ionization range of El without drawbacks in terms of sensitivity. The exception are residual gases like N<sub>2</sub> or O<sub>2</sub>.
- SICRIT<sup>®</sup> covers a major part of the ionization range of ESI. The exception are large biomolecules like proteins, etc.

### **Delivering significant economical advantages**



Plasmion's GC-SICRIT®-MS coupling leads to a significant reduction in sample processing efforts

Samples do not have to be splitted and processed on separated instrument platforms and acquired data does not have to be integrated from different software tools.



#### Plasmion's GC-SICRIT<sup>®</sup>-MS coupling reduces capital expenditure and required laboratory space

Analyses can be performed with one single MS system instead of two separate ones – this saves investment costs and avoids the need for additional laboratory space.

#### Plasmion's GC-SICRIT®-MS coupling meets highest demands in terms of performance



The flexibility in coupling with any LC-MS instrumentation gives unlimited access to the detector performance needed for the analytical task – may it be high sensitivity for targeted analysis of a distinct range of analytes or selectivity for non-target analysis of unknowns in complex matrices.



### **Provided by trusted partners**

Shimadzu and Plasmion provide an integrated solution based on the plug & play SICRIT<sup>®</sup> ionization technology. All instrumentation (GC, MS, Autosampler, SICRIT<sup>®</sup>) can be directly ordered via Shimadzu. If you already have an MS, the SICRIT<sup>®</sup> setup can also be ordered directly from Plasmion.



### Shimadzu products

#### Gas Chromatographs e.g. SHIMADZU Nexis GC-2030

The Nexis<sup>™</sup> GC-2030 is dedicated for routine GC analysis convincing with reliability and robustness. This system features a touch panel, and the Clean Pilot function automatically performs conditioning, leading to more stable analytical results while easing the burden of lab work. Together with Plasmion's GC coupling solution, the GC-2030 enables new workflows in combination with LC-MS instruments.





#### SHIMADZU AOC-6000 Autosampler

The AOC-6000 is developed to maximize productivity in the laboratory. The system switches between sample introduction methods automatically, enabling continuous operation combining different sample introduction methods.

In combination with Plasmion's product portfolio, highly automated sampling and sample analysis can be realized. Furthermore, workflows with and without GC can be implemented by one instrumental setup.

### **Plasmion products**

#### Ion Source

The SICRIT<sup>®</sup> Ion Source can be operated with any carrier gas (even room air) and thus enables direct MS screening. Moreover, it enables a gas-tight measurement of sensitive processes or fully quantitative connection to classical GC/LC methods.

The cold plasma ionization based on a dielectric barrier discharge enables fragment-free measurement of multiple analytes.





#### SC-30 Control Unit

The SICRIT<sup>®</sup> SC-30 Control Unit enables to control the cold plasma in the SICRIT<sup>®</sup> Ion Source as well as the required parameters of all connection modules (GC-SPME/LC/IR desorption). All parameters can also be controlled via a respective software. An integration with software of other vendors is not required to operate the system.

### **Plasmion products**





#### **MS** interfaces

The SICRIT<sup>®</sup> MS interfaces are dedicated for specific MS instruments to establish an electronic and mechanical connection. There are interfaces available for all common MS instruments of Shimadzu. Interfaces to other instruments are available upon request.

#### **GC/SPME** module

The SICRIT<sup>®</sup> GC/SPME Module combines ionization technology with state-of-the-art sample separation and/or enrichment techniques.

- It enables a direct SICRIT<sup>®</sup>-MS connection from a GC or microbalance via a heated transfer line.
- It enables direct SPME-SICRIT<sup>®</sup>-MS measurements with automated injections featuring an AOC-6000 or PAL autosampler.
- It enables fully quantitative direct measurements (manual or automated) of liquids and headspace samples.





#### **Heated transfer line**

The flexible SICRIT<sup>®</sup> Heated Transfer Line enables the connection between the GC and the GC/SPME Module. It is powered and controlled via an external controller or directly by most GCs as an integrated solution. The flexible and fully heated design enables loss-free sample transport and avoids cold spots.



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