



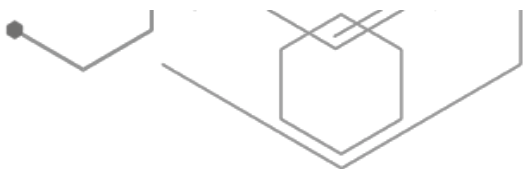
Plasmion
simple smart sensitive

SICRIT[®] Ionization technology

New Era in Mass Spectrometry

Product Overview Report





Product Description

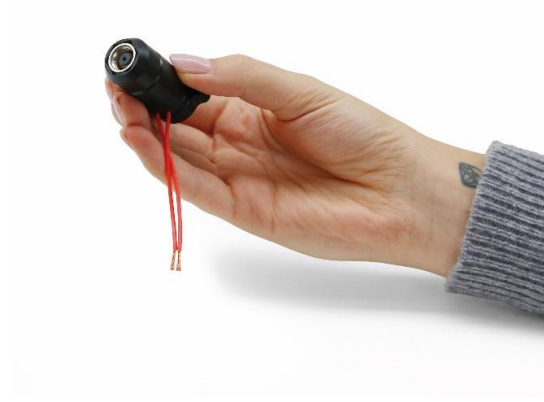
SICRIT-SENSOR TECHNOLOGY – AN INNOVATIVE SOLUTION:

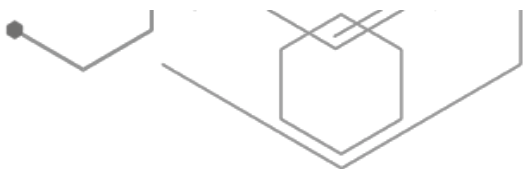
The SICRIT[®] (Soft Ionization by Chemical Reaction in Transfer) technology is an ion source technology which is used in combination with mass spectrometers (MS). Unlike conventional ion sources, the SICRIT[®] source decouples sampling from detection. This means that a sample does not have to be supplied to the MS in preprocessed form (extract), but in the simplest case can be placed and measured directly in front of the MS. The gas space above the sample is drawn directly through the ion source into the spectrometer, allowing real-time measurement of samples without preparation.

Another key feature of the technology is its flexibility to be operated with any commercially available LC-MS, which means, that analytical sensitivity and specificity is only limited by the performance of the corresponding detector, but not the SICRIT[®] source. In addition, the range of substances that can be ionized and thus be detected by SICRIT[®] is very large and superior to other ion sources.

All core properties together allow a comprehensive sample characterization in high time resolution and without the need for complex sample preparation. The SICRIT[®] technology thus represents a completely new approach in instrumental-based volatile organic compound (VOC) analysis. It offers not only the possibility of a fast and sensitive measurement of specific known marker substances, but also a comprehensive characterization of unknown samples. This so-called "non-target" approach can discriminate between categories of samples based on a cluster analysis. Considering the complete substance spectrum of the sample material, VOC patterns of different samples can be compared and aligned with the respective perception of human sensory panels. This enables a better consistency between human sensory findings and instrumental analysis.

Additionally, if the analytical task due to any circumstances required more elaborate sample preparation or separation methods, the flexibility of the technology also allows to couple any state-of-the-art chromatography equipment. If required, it is thus also capable to perform even detailed laboratory analysis.





Economic Advantages

ONE-OF-A-KIND TECHNOLOGY OPENS FULL POTENTIAL OF MASS SPECTROMETRY:

Significant reduction in analysis time

The plug & play mechanism of the SICRIT[®] ion source enables an installation within less than a minute. It does neither require calibration nor sample preparation and is thus suitable to answer analytical questions fast and efficiently.

Costs and capital expenditure reduction

The SICRIT[®] ion source leads to a significant decrease in running costs for chemical analyses, as it does not require any consumable like noble gases. Since it can be used for almost all MS-related applications, it avoids the capital expenditure for multiple dedicated ion sources

High-throughput technology

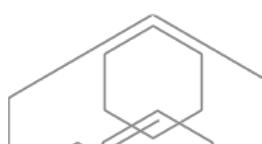
The flexibility of the SICRIT[®] ion source in coupling with any LC-MS instrumentation gives unlimited access to the detector's performance needed for the analytical task. The flow-through design of the source additionally increases the analyte transfer into the respective LC-MS system, enhancing sensitivity.

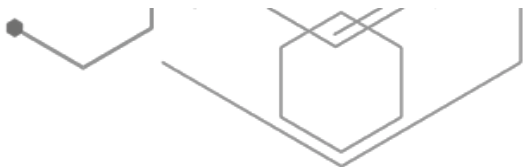
Ultimate versatility

The SICRIT[®] ion source is the only technique that provides a seamless coupling with all chromatography methods like GC, LC or SFC.

Bottom-line Advantages

Plug-and-play device for 24/7 operation	✓
Hand-portability in combination IMS instruments	✓
Trolley-portability in combination with MS instruments	✓
High throughput technology (automation possible)	✓
Instantaneous measurement results	✓
Increased sensitivity and VOC coverage	✓
Simple and miniaturized design	✓
Low maintenance, almost no service-after-sales required	✓
Almost no OPEX and comparably low CAPEX	✓
Turnkey solution customizable in terms of price and performance to use-case requirements	✓





Application Variety

ONE SOURCE, ENDLESS APPLICATIONS:

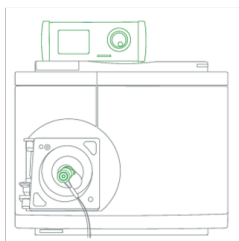
Direct Screening

VOC fingerprints of solid or liquid samples can be obtained instantaneously by simply holding the sample in front of the ionization source. This enables sensitive aroma profiling, product classification, or detection of trace contaminants.

Direct and quantitative measurements of solids, liquids, and gaseous samples (e.g., by headspace sampling or using SPME fibres) may be performed manually or completely automated in combination with a CTC PAL system.

Direct MS analysis can be performed on robust and portable single quad instruments as well as on high-end HR-MS TOF or Orbitrap instruments, only depending on the analytical task.

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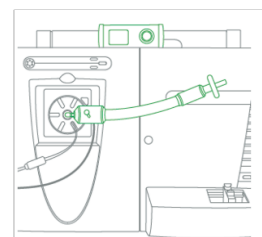
Real-time Monitoring and Diagnosis

The flow-through design and its universal gas-tight 1/8" connection enables the quantitative real time monitoring of industrial processes, comparable to dedicated and expensive PTR instruments.

Depending on the MS used, the superior resolution or MS/MS capabilities of current laboratory LC-MS instruments can be fully exploited for monitoring of bioreactors, production facilities, security applications or alike.

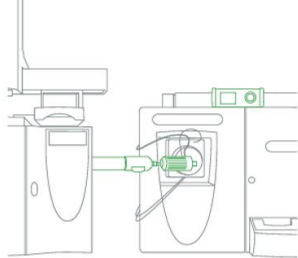
MS-based breath analysis is one of the youngest research areas in biomedical diagnostics, allowing for online, non-invasive testing of patients. SICRIT® is already used in various studies to discover biomarkers for COVID-19 or other respiratory and metabolic diseases or disorders.

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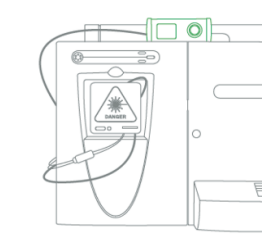


SICRIT®

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Universal Chromatography Couplings

Soft ionization GC-MS coupling increases sensitivity and is ideal in combination with High Resolution Mass Spectrometry (HR-MS). This provides molecular information by soft ionization in combination with high mass accuracy, dedicated for target and especially non-target analyses.

All-in-one-workflow integration reduces effort and costs in routine analysis as it features fast prescreening of samples without chromatography, meaning GC-MS analysis is only needed for positively screened samples.

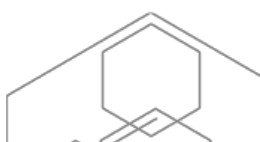
MS Imaging

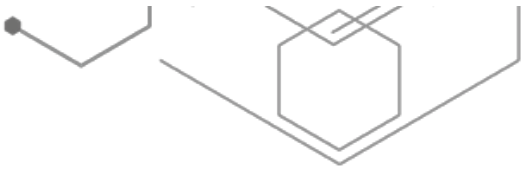
"The SICRIT® source can be hyphenated to any commercial laser ablation system and nearly any API mass spectrometer that is commercially available. This makes this technique easy to adapt to individual needs regarding the sample type and analytical question."

Funke, S.K.I. et al., Anal. Chim. Acta 2021, 1177, 338770.

"The ease with which the SICRIT® device can be installed and the minimal need for optimization presents this commercially available tool as an attractive method for simple postionization for any AP-MALDI MS imaging."

Elia, E.A. et al, Anal. Chem. 2020, 92, 15285-15290.





Selected Customer Testimonials

• This technology enables a significant gain in efficiency and research output for us.



Prof. Schmitt-Kopplin
HHZ Munich

• The unsurpassed sensitivity in combination with the extreme robustness and ease of use of SICRIT allow us to use MS in completely new fields.



Prof. Christoph Haisch
TU Munich

• The flexibility of the SICRIT® technology is amazing. With one ionization source we now can do several different applications.



Prof. Philipp Weller
HS Mannheim

• Plug-and play of the ionization source is a great advantage in our current research projects. Switching sources takes seconds and offers great flexibility for our daily business. In addition, the source is very versatile in its application. Service from Plasmion was great and enabled us to set up a challenging combination of a LC- and GC -MS/MS system.



Dr. Christian Steuer
ETH Zürich

• Out of 250 samples received, many of them were undetectable by APCI or ESI but perfectly ionizable by SICRIT. Additionally, in a direct and fast manner.



Dr. Laure Menin
EPFL Lausanne



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