



HYPHENATED TECHNOLOGIES

FOR MATERIALS
DEFORMULATION



SRA 
INSTRUMENTS
ANALYTICAL SOLUTIONS

Material characterization is essential across a wide range of industries to uncover hidden sample data. While Thermogravimetric Analysis (TGA) quantifies weight loss, it cannot identify composition of evolved gases. Hyphenating instruments unlocks deeper insights, making the analytical capability greater than the sum of its parts. SRA Instruments delivers advanced, integrated solutions for Evolved Gas Analysis (EGA) coupled with TGA.

LUNIA TGA Micro GC

LUNIA TGA Micro GC is a fast organic and inorganic gas analyzer on its own.


It's a modular device made by 1 to 4 analytical modules working simultaneously and offering separation of compounds from a gas mixture within 3 minutes. Each module is a complete chromatograph with micro-injector, capillary column and universal thermal conductivity detector (μ TCD). The **Micro GC** sequence of analysis is started by the TGA at the beginning of the thermal degradation. Then the compounds generated from evolved gas are separated and detected every 2 or 3 minutes in a concentration range from few ppm to 100 % with a very good linearity.


SOLIA TGA Micro GC/MS

SOLIA is a SRA Micro GC/MS solution ready to be coupled to a TGA.

The heated transfer line is designed to analyze the evolved gases. The configuration includes heated membrane filter that protects the analytical module injector from heavy compounds and residues. The μ TCD of each **Micro GC** module can be coupled to an Agilent quadrupolar mass spectrometer which makes possible an easy identification of each separated compound. The identification is simply made using mass spectrum comparison with the NIST database. The TGA **Micro GC** coupling is the perfect solution for fast qualitative and quantitative analysis of evolved gas from a polymer or solid sample.



Technical specification
Configurable Micro GC with up to 4 modules
Less than 3 minutes of analysis time
Heated interface with a software programmable valve
Selectable alarms related to concentrations, trends or comparison
 SRA SOPRANE Software

Technical specification
Micro GC/MS coupling
Automatic valve selection of the channel coupled to MSD before or during the sequence
Configurable Micro GC with up to 4 modules
Less than 3 minutes of analysis time
Heated interface with a software programmable valve
 SRA SOPRANE Software

ZEFIRUS TGA-FTIR Interface

The combination of a **Thermogravimetric Analyzer (TGA)** with an **Infrared Spectrometer (TG-IR)** is the most common type of **Evolved Gas Analysis (EGA)** in use today. Coupling the TGA to a **Fourier Transform Infrared (FTIR)** spectrometer adds considerable utility to the method. The vapors released from the material pass through a gas cell inserted in the FTIR, where the spectrum is obtained. Spectral searching provides the last link of vapors identification and thanks to the ability to detect functional groups, FTIR analysis allows greater understanding of the processes seen in the TGA.

Technical specification

Active flow technology: real quantitative analysis with no FTIR signals overlapping

Heated gas cell and SilcoSteel® transferlines up to 350 °C

Zero gravity cell design: no more fouling or dirtiness phenomena

Customized adapter for every TGA model

SRA Kinetic software directly controls Agilent Cary 630 FTIR: time resolution analysis and live quantitative data



SRA Active Flow Technology



SRA Kinetic Software

What is the Active Flow Principle?

$$PV = nRT$$

The SRA interface we designed is based on the idea of active flow sampling with which, thanks to a pump and a mass-flow controller, the amount of the gases mass entering the gas cell is always constant during all the experiment, independently from gas density. In other words, the pump modulates its action considering the gas expansion respect to the temperature of the TGA furnace. In this way the FTIR data will always match the TGA graph during all run time of the experiment avoiding dilution factor due to the gases expansion.

Active Flow Technology is common to Maximum and Zefirus SRA interfaces.



SRA Active Flow Technology



TGA-GC/MS Interface

Thermogravimetry combined with gas chromatography and mass spectrometry (TGA-GC/MS) can be one choice for the qualitative and quantitative analysis of evolved gases.

- During the thermal degradation cycle of the materials, the composition of the evolved gas changes too fast for a GC/MS analysis in its standard configuration.
- With IST Interface, the chromatographic separation time is no longer a limitation for the detailed study of complex thermal analysis profiles.

IST1 Interface

The **IST1 interface** allows to store 1 loop of the gaseous effluent from the TGA and to automatically inject it into the GC/MS. The IST1 is designed to be coupled to any TGA and GC/MS models. IST1 can be upgraded from 1 to 16 loops.

Technical specification

1 storage loop

Transfer lines temperature: 250 °C

Loop volume: 250 µL in standard, customised volumes on request

Multisystem compatibility

Fully automated

Lines and loops treatment: Sulfinert



SRA IST Software

IST16 Interface

IST16 interface allows to sequentially store in 16 loops several fractions of the gaseous effluent from the TGA and to automatically inject these samples into the GC/MS. The gases, evolved during the cycle of the TGA, are transmitted to the storage interface and then to the GC via heated and temperature controlled micro-volume transfer lines and IST16 is designed to be coupled to any TGA and GC/MS models. The IST16 is supplied with a dedicated interface.

Technical specification

16 storage loops

Transfer lines temperature: 250 °C

Loop volume: 250 µL in standard, customised volumes on request

Multisystem compatibility

Fully automated

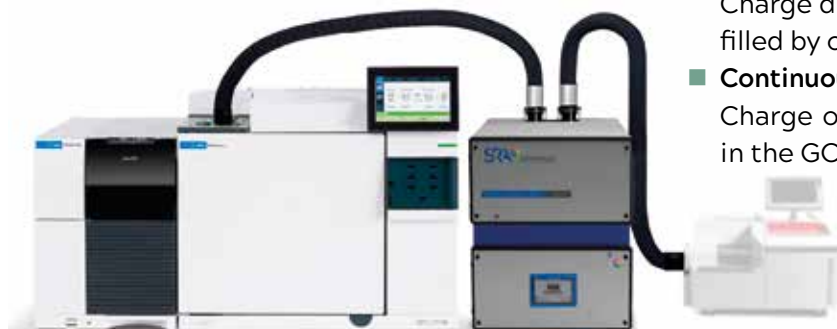
Lines and loops treatment: Sulfinert



SRA IST Software

With the IST16 Interface, it is possible to operate in two modes:

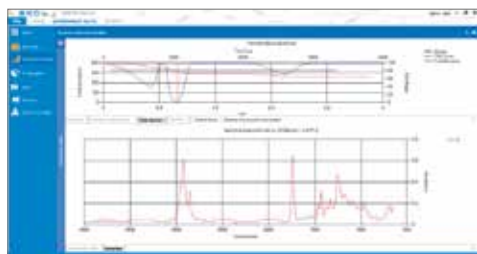
- **Collecting-revolving**
Charge different loops following a time table filled by operator and then inject in the GC.
- **Continuous single-loop**
Charge one single loop and direct injection in the GC.



SRA software



SRA Kinetic Software



The **SRA Kinetic software** is a user-friendly software developed to manage real time monitoring analysis for the Agilent Cary 630 FTIR. The acquisition parameters are saved in a single method, and spectra are saved in a single file for post-processing. During the experiment the specialist can display two overlaid spectra and monitors the trend of two spectral areas of interest with the possibility to have a 3D view of spectra over time. SRA Kinetic is compatible with TGA triggered acquisitions and let to have real-time quantification of an interested peak.



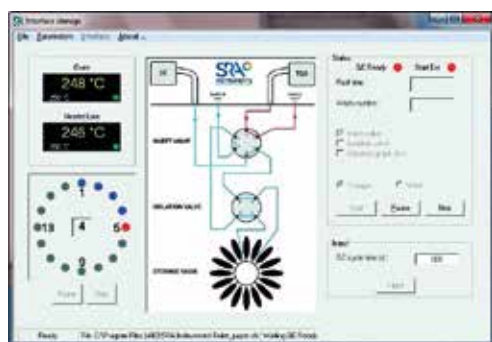
SRA SOPRANE Software



Developed by **SRA**, **SOPRANE II** performs the complete management of an analysis, from the sampling to the transmission of the results. A powerful graphical environment provides effectiveness and ease of use: it is possible to define a method and a sequence of analysis, to follow the trends for specific compounds during a TGA analysis. Soprane manages the mass spectrometer and its Agilent Masshunter software and compiles all results in a same report.



SRA IST Software



The **SRA IST software** allows to edit the storage sequence, save the methods, view the status of the instrument and automatically manage the start of the GC analyses. The gases evolved during the cycle of the TGA are transmitted to the storage interface and then to the GC via heated and temperature controlled micro-volume transfer lines.



CONCLUSIONS

Maximizing EGA Performance

- SRA Instruments bridges the gap between material weight loss and precise chemical identification. Our advanced TGA interfaces – featuring active flow technology, multi-loop storage systems, and fast Micro GC/MS coupling – deliver comprehensive Evolved Gas Analysis (EGA).
- Powered by dedicated, user-friendly software, SRA solutions provide exceptional clarity for complex de formulation challenges.



Contact us fo a demonstration
or a personalized quote!



*This information is subject to change
without notice.

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