LUMOS Stand-alone FT-IR microscope with full automation

LUMOS is a stand-alone FT-IR microscope with full automation. It is designed to combine best performance for visible inspection and infrared spectral analysis with highest user comfort.

- Stand-alone FT-IR microscope with full automation
- Very comfortable and easy to use
- Motorized ATR crystal (ATR = Attenuated total reflection)
- Large working distance; allowing ample space for sampling
- High quality in both, IR and VIS range

Fully automated FT-IR microscopy for ease of use

The LUMOS is a stand-alone microscope with an FT-IR spectrometer perfectly integrated into its optical design. Due to the motorization and networking of all moveable components inside the LUMOS, the system provides a high degree of automation for maximal comfort in use.

Motorized ATR crystal

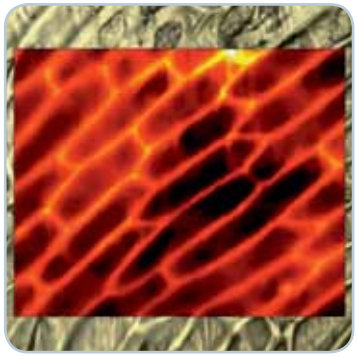
A major innovation is certainly the motorization of the ATR crystal in the objective. Due to this unique feature all IR measurements, even those in ATR mode, are performed fully automated with the LUMOS. An integrated pressure control ensures the constancy of the pressure applied from the crystal to the sample which is essential for mapping and imaging experiments.

Validation

The LUMOS includes fully automated instrument tests for operational (OQ) and daily performance (PQ) qualification. Its software (OPUS) complies with GMP/GLP/cGMP regulations and optionally also with the FDA guideline 21 CFR p11. Instrument qualification according to the European (2.2.24) and Japanese (2.25) pharmacopoeia is available.

The LUMOS provides plenty of space for the sample and a large working distance.

For macro sampling the LUMOS can optionally be equipped with the MACRO UNIT.



IR image shows the distribution of lipids within onion tissue.

Automation

All moveable components of the LUMOS are motorized and networked. This includes:

- Motorized ATR crystal
- Motorized transparent knife-edge aperture
- Motorized condenser
- Motorized Vis polarizer + Vis analyzer (option)
- Motorized stage (option)
- Motorized z-drive
- Motorized change from IR and Vis mode
- Motorized change of numerical aperture in IR and Vis mode
- Electronic recognition of stage plates

Workflow and software

The LUMOS is controlled by the OPUS software; an easy-to-use and powerful spectroscopy software which assists the full process from data acquisition via data processing and data evaluation to data reporting.
OPUS-Video guides the user step-by-step through the process of data acquisition.
A measurement results in a single file including visible images, spectral data and information about the sample and the experiment. Also evaluation and visualization of the resulting data are performed in OPUS. Even large mapping and imaging data can be processed very easily in OPUS and many univariate- and multivariate methods for data evaluation are available. A wide variety of 2D/3D views with IR images in 2D or 3D on top or next to the video images of any sample is provided. For identification of certain components a library search with individual spectra from IR-mapping/imaging data or the multi linear regression of full IR-images with reference spectra can be performed.

Macro sampling

For the investigation of larger samples a MACRO UNIT is available to be connected to the left side of the LUMOS. The MACRO UNIT allows the use of all QuickSnap™ sampling modules of the compact FT-IR spectrometer ALPHA. Various QuickSnap™ modules for transmission, diffuse and specular reflection as well as attenuated total reflection (ATR) provide sampling flexibility for almost all kinds of solid, liquid and gaseous samples.

Low cost of ownership

- Reliable permanently aligned RockSolid™ interferometer with long life time (> 10 years)
- Diode laser with long life time (> 10 years)
- Infrared light source with long life time (> 5 years)
- LED illumination
- Low energy consumption
- Purged air not required
- Compact footprint (width x depth = 30 x 52 cm)

LUMOS

The LUMOS includes an 8x objective which is used in transmission, reflection and ATR mode. In transmission and reflection the ATR crystal is inserted into the objective. For data acquisition in ATR the crystal is positioned into the IR focus by an encoded piezo drive. An integrated pressure control ensures the constancy of the pressure applied from the crystal to the sample which is essential for mapping and imaging experiments.

Bruker Optics is ISO 9001 certified.

Laser class 1

Technologies used are protected by one or more of the following patents:
DE 102004025448; DE 19940981; US 5923422; DE 19704598; DE 102012200851; US 8873140

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