Automated FTIR imaging microscope

Description/Parameters

The automated FTIR imaging microscope LUMOS II (Bruker, USA) equipped with a Focal Plane Array (FPA) detector combines digital microscopy with infrared spectroscopy. The LUMOS II is a fully robotic, joystick-controlled microscope that enables measurements in transmission, reflectance and ATR modes. Detection is possible with both the TE-MCT detector and the FPA detector (cooled with liquid N_2), which allows the creation of chemical maps. Thanks to the construction of the microscope, it is possible to analyse both large samples without the need for pretreatment (whole objects, e.g. paintings, food packaging, etc.) and samples on special IR-permeable filters (e.g. made of alumina). Since our main interest is the analysis of microplastics in the environment, the standard OPUS software program for data acquisition is complemented by the Purency software, which, based on advanced algorithms, evaluates the chemical map obtained by FPA detection and assesses the presence of only 20 selected polymers. The analysis is very fast compared to other commercially available alternatives, for a full cycle of measurement and evaluation of one sample, 2-4 hours are needed depending on the size of the measured area.

- Measurement in transmission/reflective/ATR mode
- TE-MCT/FPA detectionSpectral range 700 - 6000 cm^{-1}
- Spectral resolution: at least 2 cm^{-1}
- Interchangeable attachments for whole objects/filters/thin film analysis
- OPUS/Purency software
- Multiple spectral libraries for identification

Utilization/Services

Analysis of microplastics on aluminium filters (Whatman® alumina Anodisc filter discs 0.2 µm), analysis of chemical composition of surfaces, thin films, ATR-FTIR analysis.