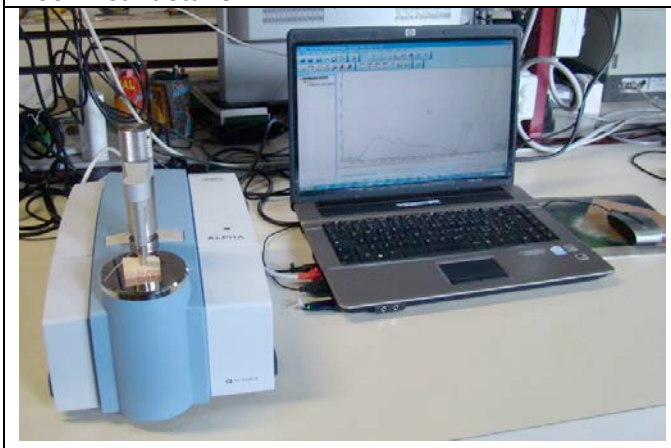
Consiglio Nazionale delle Ricerche

IVALSA
TREES AND TIMBER INSTITUTE

Mid Infrared Spectrometry

SWORFISH project

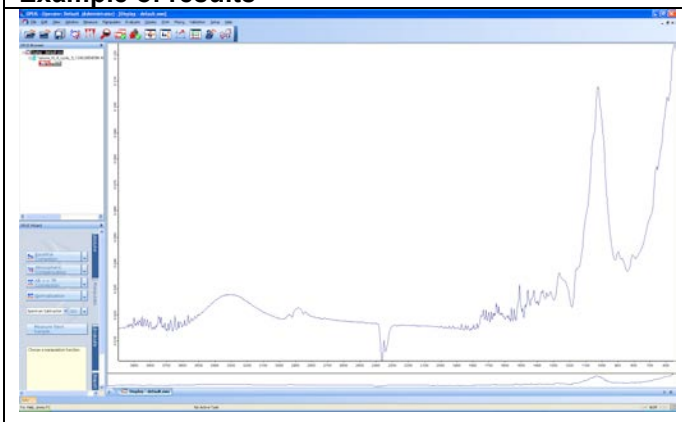
Technical details



Fourier Transform Mid Infrared Spectrometer
Type: ALPHA
Producer: Bruker Optics GmBH
Spectral range: 400-4000cm^{-1}
Resolution: 4cm^{-1}
Measurement modes:

- Transmittance
- ATR (Attenuated Total Reflectance) diamond
- ATR ZeSn
- Reflectance

Example of results



The result of measurement is a MIR spectrum. It must be pre-processed (baseline correction, normalization, derivative, etc.) before further interpretation.
The spectra include information about the functional groups of molecules charged with dipole momentum (such as –OH, -CH, etc.)

The series spectra can be used for:

- Quantifying/qualifying chemical properties
- Identification of unknown samples
- Prediction of selected properties
- Among others

Technique description

Mid infrared spectroscopy is an analytical method based on the optical interferometry. The modulated infrared light is emitted to the object and part of the light reflected/transmitted is acquired by the system in the form of interferogram. By applying the Fourier Transform it is possible to obtain the spectra.

As the infrared energy absorption by molecules is very selective and proportional to the quality of functional groups excited. As a result it is possible to interpret the spectra linking it to selected material properties.

Comments

The instrument is a part of the Wood Quality and Non-Destructive Testing Laboratory leaded by Martino Negri, PhD.

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