Fourier Transformed Infra Red (FTIR)

SCIENCE ET SURFACE
Filiale de SERMA TECHNOLOGIES

SPECIFICATIONS

- **Qualitative molecular analysis** (nature of the chemical bondings) and **quantitative** (with standard)
- Analysed depth: a few µm (en reflection)
- Diameter of the analysed area: 100 µm in microscopy (micro-ATR),
- **Chemical imaging: 500 × 500 µm²** with a maximal lateral resolution of 1.5 µm (ATR imager)
- Non destructive analysis (in reflection or in transmission)
- Analysis under room atmosphere

PRINCIPLE

This technique is a vibrational spectroscopy based on the absorption of an Infrared beam by the sample. Each molecule emites, by its chemical bondings, vibrations from different types (elongation, deformation, …). These vibrations are absorbing the infrared beam at different wave lengths according to the nature and the type of the vibration. The position (characteristic kenght converted in wave number) and the shape of the absorption bands of the spectrum are thus characteristic of the chemical groups from where they come. That's why, a particular compound (for example a polymer) gives a spectral fingerprint in infrared which is specific and could be identified.

For the analysis, the infrared beam from the source via the interferometer (which change the wave lenghts of the beam in interferrogramme), is totally transmitted (in cross-section, or in thin layer on an infrared transparent substrate), or reflected on the sample (by specular reflection or by attenuated total reflection - ATR) until the detecteor. The last one gives the signal as an interferogramme converted in infrared spectra by Fourier transformed. The intensity of the absorption is in principle proportional to the concentration of the concerned chemlical group, that's why the the technique can be quantitative (on the basis of calibration curves).

The infrared technique is an easy technique to obtain quick informations on all types of samples.